

The Law of the Sea and Ocean Industry: New Opportunities and Restraints

Proceedings

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FOREWORD

The Sixteenth Annual Conference of the Law of the Sea Institute was the product of a collaborative effort between the entire staffs of Dalhousie Ocean Studies Programme and the Law of the Sea Institute. Many hands and talents contributed to the success of the Conference. Special thanks are due to Dr. Paul Fye, Board Chairman of the Institute, who served as Co-chairman of the Conference; to Dr. John Vandermeulen, who coordinated the Special Symposium at the Bedford Institute of Oceanography; to those who chaired the various panels; and, of course, to Doctors Edgar Gold, John Craven, and Scott Allen, who contributed in many important ways to the planning of LSI 16.

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In reaching out to a larger than usual audience, we produced a larger than usual conference. Unfortunately the length of the Proceedings created longer delays in publication than we would have wished. We ask for the reader's indulgence.

Douglas M. Johnston and Norman G. Letalik, Co-editors

KEYNOTE ADDRESS

Bernardo Zuleta
Under-Secretary-General
Special Representative of the Secretary-General
to the Third United Nations Conference
on the Law of the Sea

Only seven weeks ago, after eight years of highly complex negotiations, preceded by six years of preparatory work, a new Convention on the Law of the Sea was adopted by an overwhelming majority that included all the regions of the world, all the different legal systems, a large number of industrialized States and the vast majority of coastal, geographically disadvantaged, and landlocked States.

The Conference, as is well known, made every effort to achieve general agreement in order to have the Convention adopted without a vote. During the last stages of its work, the Conference had to face three very difficult issues that remained pending and, at the same time, had to consider the position adopted by a major protagonist, the United States. It is well known that the new Administration in that country decided to undertake a complete review of the agreements already reached during the negotiations and that the outcome of such a review was disclosed by the President of the United States on January 29, 1982. On that occasion President Reagan stated that while most provisions of the Draft Convention were acceptable and consistent with United States interests, some major elements of the deep sea-bed mining regime were not acceptable, but he continued saying that the United States remained committed to the multilateral treaty process for reaching agreement on law of the sea.

The Conference was able to find generally acceptable solutions to the pending issues, namely the question of preparatory investments, the question of the role and functions of the Preparatory Commission, and the issue of the right of entities other than states to sign the Final Act, to sign the Convention, or to participate in the future Sea-Bed Authority.

On the first question, every effort was made to find a pragmatic solution that would enable the pioneer investors to continue with their research and development projects in a manner consistent with the future Convention. A solution was found that would enable the different consortia made up of shareholders or participants of different nationalities to be covered by the future Convention, register specific mine sites with the Preparatory Commission, and acquire a priority for the approval of plans of work. In accepting these formulations, the developing countries showed an incredible degree of flexibility in their effort to facilitate a general agreement, while not re-opening the fundamental elements of the system of exploration and exploitation of the sea-bed that had been worked out with great difficulty over a period of eight years. A group of delegates from 11 industrialized countries, who were described

by the President of the Conference as "the good samaritans," exercised their diplomatic skills, their legal wisdom and their patience, trying to bridge the gap.

The Conference had decided, during its tenth session, on a rigid calendar and programme of work that could make it possible under any circumstances to begin the formal decision-making process no later than April 23, so that the Convention could be adopted at the latest on April 30. Since this decision had been endorsed unanimously by the General Assembly of the United Nations, it should have come as no surprise that the Convention was indeed adopted on April 30, albeit after a formal request for a vote by and of the delegations. As you know, 130 votes were cast in favour of adoption, 17 delegations abstained, and four delegations voted against. Those abstaining included a number of countries from the Eastern socialist group, who, in their explanation of vote, made it clear that they had no objections to the Convention as such, but that they had difficulties accepting the resolution on preparatory investment which, in their view, contained provisions that discriminated against certain countries and gave too favourable a treatment to other countries. The delegations abstaining also included some industrialized countries whose explanation of vote made it clear that they would have preferred to adopt the Convention by consensus. In explaining its negative vote, the United States delegation stated that it had difficulties in accepting a package that did not meet all of the concerns contained in President Reagan's statement of January 29, 1982. The three other negative votes were based on grounds that had nothing to do with the position of the United States. It is worth mentioning that at least three of the states that are likely to sponsor pioneer investors, Canada, France, and Japan voted for the Convention.

The decision taken by the Conference has to be seen in the context of political and legal developments that have taken place during the last thirty years. This Convention represents the longest, most ambitious and most innovative endeavour ever undertaken by the community of nations. After UNCLOS III the legal regime for the oceans will certainly be substantially different from the customary law of the sea which existed throughout the preceding four centuries.

There is widespread support for the view that even if the First and Second Conferences on the Law of the Sea had been able to produce a general agreement on the uniform breadth of the territorial sea, political and technological developments would have made it necessary to re-open the whole question of the utilization of ocean space and the exploitation of its resources. A new awareness has been developing for some time that the traditional doctrine, according to which the sea beyond a narrow belt under territorial sovereignty was *res communis*, could not offer a valid answer to the threats posed to the marine environment by the new technologies, nor could it give the necessary legal and political stability to the substantial investment that would be necessary to explore and exploit the resources of the sea, the sea-bed, and the ocean floor.

The idea that the sea was the common heritage of mankind ("patrimoine de l'humanité") and should be administered by a society of nations had been advanced near the turn of the century by a remarkable French legal thinker, Monsieur de Lapradelle. His proposal was dismissed by his contemporaries, who were more inclined to preserve a system that had served well the interests of the traditional maritime powers, but the concept surfaced again in 1958, in the opening statement made by the President of the First Law of the Sea Conference, Prince Wan Waihayakon of Thailand, who wanted to emphasize that any legal regime applied to ocean space should ensure the preservation of the sea and its resources for the benefit of all.

The need to ensure the protection and preservation of the sea-bed environment and, at the same time, to provide a stable legal and political framework for the exploitation of its resources, must have been foremost in the mind of President Lyndon B. Johnson when, on the occasion of the launching of a research vessel in 1966, he warned against the creation of "a new form of colonial competition among the maritime powers" and "a race to grab and to hold the land under the high seas." He stated that "we must ensure that the deep sea-beds and the ocean bottoms are, and remain, the legacy of all human beings."

The initiative launched by Ambassador Pardo of Malta one year later was not only very well conceived but also timely, and the concept of the common heritage emerged as the only possible legal framework within which the wealth of the sea-bed could be utilized for the benefit of mankind as a whole, without endangering the oceans as a source of life. It must be observed that the expression "common heritage" at this point had been translated into French as "patrimoine commun" and into Spanish as "patrimonio comun."

In most legal traditions it is the duty of the heirs and successors to preserve and maintain undivided the patrimony, so that the fruits therefrom can benefit succeeding generations. The expression in a broader sense has always been used to denote some intangible assets of a human being, a society or a nation, and it is in that sense that we speak of the cultural, artistic, or moral heritage. Most lawyers will agree that the concept of common heritage carries with it a necessary balance of rights and duties but, in particular, the obligations to protect and preserve the patrimony, while making the benefits available to all those who are entitled to them.

During the preparatory stage, it became clear that the definition of the limits of the area that would be treated as common heritage required a prior determination of the nature and extent of the national jurisdiction of coastal states, a question whose solution had eluded the international community for more than 400 years. In the process it was widely recognized that the traditional concept of a narrow territorial sea based on the distance of the cannon shot, coupled with a continental shelf whose outer limits remained vaguely defined on the basis of the exploitability test, would not ensure the necessary legal and political environment to encourage research,

development, and capital investments. Nor would it reconcile the interests of states that depended very heavily on their own coastal resources for food and energy with those of the international community which needed to preserve the freedoms of navigation, overflight, and other freedoms normally associated with the peaceful utilization of ocean space.

The realization that all the legal problems of the sea were interrelated and had to be treated as a whole made it inevitable that the new Law of the Sea Convention would have to be negotiated as a package deal both as a process of codification and of progressive development, with a view to adoption of new rules, the constitution of an international organization, and the conferral of jurisdiction on tribunals either existing or yet to be established.

The Convention accomplishes a wide variety of tasks: for example, it defines a territorial sea of up to 12 miles within which the traditional right of innocent passage is preserved; establishes a legal regime for the transit passage through straits and defines the duties of states bordering those straits; recognizes the new concept of archipelagic states and establishes a regime for the passage through archipelagic sea lanes; recognizes and regulates the right of access of landlocked states to and from the sea; defines the outer limits of the continental shelf where it extends beyond 200 nautical miles; adopts rules for the conduct and promotion of marine scientific research; contains a very comprehensive legal framework for the protection and preservation of the marine environment; deals with the difficult question of delimitation between states with opposite or adjacent coastlines; and, at the same time, establishes the International Sea-Bed Authority and its operative arm, the Enterprise, within a highly complex legal system for the conduct of activities in that area that take into account the diversity of economic and political interests that may be involved. But the feature of the Convention that is most likely to attract the attention of the Governments of coastal states in the immediate future is the exclusive economic zone, another legal and political novelty that emerged as the only possible compromise between opposing trends.

The exclusive economic zone is not simply a capricious extension of national jurisdiction. It contains a careful balance of rights and duties of the coastal state and other states with regard to the rational management of living and non-living resources, the conduct of marine scientific research, the preservation of the marine environment and other economic uses of the waters, the sea-bed, and the ocean floor.

With regard to living resources, it establishes the duty to promote the objective of optimum utilization and the maintenance of levels which can produce maximum sustainable yields, provides a comprehensive framework for the negotiation of any surplus taking due account of the needs of states which are landlocked or whose geographic situation makes them dependent upon the exploitation of the fisheries of their neighbors for the nutritional needs of their populations, and it opens the door to

new forms of international cooperation, particularly in the case of countries bordering closed or semi-enclosed seas.

With regard to non-living resources, the regime of the exclusive economic zone restates pre-existing international law with respect to the continental shelf throughout the natural prolongation of the land territory to the outer edge of the continental margin or to a distance of 200 nautical miles where the outer edge does not extend up to that distance. In addition to petroleum resources, many coastal states will find polymetallic nodules and, very likely, polymetallic sulphides whose recent discovery, mainly within coastal areas, has raised so many expectations. The coastal state has sovereign rights for the purpose of exploring and exploiting those resources, and potential investors will have to examine very carefully their options in this connection, based on the different national policies, and compare them with the prospects offered by deep-sea mining in the International Area.

Since the publication of the first Informal Single Negotiating Text in 1975, more than 100 states in various geographical circumstances and at different levels of development have adopted legislation with regard to extended maritime jurisdiction. In many but not all of those cases, the legislation has followed very closely the emerging UNCLOS III provisions on the territorial sea and exclusive economic zone. Reflecting on these trends, many commentators have suggested that the text emerging from the negotiations accelerated and consolidated the process of national legislative development.

This process is obviously having a profound effect on the conduct of fishing in several parts of the world. The most significant effect will be on the ability of developing coastal states to extract benefits of all types from the resources off their coasts. There has been an appreciable decline in the activity of foreign long-range vessels off the coast of many developing countries. Some adjustments will inevitably take place in different regions, depending on the ability of the local fishing industry, with international assistance, to develop its own catching capacity and take over from the distant fishermen, or to enter into sophisticated joint ventures. This evolution will give small countries such as Costa Rica, Fiji, Sierra Leone, or Sri Lanka a chance to benefit more substantially from the living resources within their exclusive economic zones, and protect them from practices that have endangered their maintenance at a level consistent with a maximum sustainable yield.

Let me say that I find it difficult to agree with those who describe the law of the sea as a selfish grab for the oceans' resources. Countries such as those I have mentioned are surely entitled to make sure that their own populations benefit from the catches in their exclusive economic zone.

How the new Convention will affect the future of fishing and other sectors of ocean industry will be the subject of this very timely conference of the Law of the Sea Institute. I am sure that most participants will agree that the new legal regime

offers a broad range of new opportunities to ocean-related industries. The impact will be felt, for example, by the manufacturers of sophisticated oceanographic research vessels and equipment, patrol boats, naval aircraft, monitoring devices, canning factories, and those new modes of technology designed to utilize currents and winds for the production of energy. There can be no doubt that a comprehensive law of the sea will provide the right environment for new investments in all of those areas, not only by industrialized countries but also by developing countries. Under the new legal regime ocean management has become a new tool for social and economic development.

Unlike the law of treaties, of course, the new Convention will bind only states which choose to become parties by ratification and only after a certain number of instruments have been deposited. However, a universally negotiated convention such as this may also have an impact on customary international law, although questions of this kind do not lend themselves to very precise answers. Nor is it clear whether states which choose not to become parties to the Convention can invoke state practice or conventional provisions of their choice against parties, or in fact what parts of the package would be available to those which have in the end rejected it.

It can be argued, of course, that many new developments in the law of the sea that found their place in the Convention are generally recognized as new customary law through a process that was accelerated by the Conference itself. This may be true in a general way for some aspects of coastal jurisdiction, but there is no common denominator outside the Convention with regard to state practice in such matters as optimum utilization and sustainable yield in fisheries, drilling, marine scientific research, protection of the marine environment, passage through straits, designated sea lanes, or even the drawing of baselines.

By way of example, let me refer to state practice in the Caribbean basin, where at least ten different variants of extended jurisdiction can be found from a limited fisheries zone that excludes some of the migratory species to a claim of unqualified territorial sovereignty. Only ten out of 24 Caribbean countries have modeled their legislation on some of the provisions of the Convention, without taking upon themselves some of the duties that have been the subject of hard bargaining in the process of building the global package. Article 73 of the Convention, for instance, rules out imprisonment or any other form of corporal punishment as a means of enforcing fishery regulations, but some countries have legislation which includes such drastic measures, and many others may find it tempting to adopt similar laws in the absence of a binding conventional rule. Is this the kind of customary law of the sea that would be invoked by those states which choose not to become parties to the Convention?

It may be even more difficult, in the absence of a generally agreed convention, to identify the appropriate rules of international law based on state practice in such matters as passage through straits, marine scientific research, or the

outer limits of the continental shelf. Let us not forget that state practice in the present world does not have a common diplomatic language, and it has to be inferred from a multiplicity of legislative and regulatory actions based on diverse legal and political systems and reflected in official documents which are authentic only in their original language.

I feel confident that the vast majority of countries that would like the law of the sea to be real international law, and not simply the expression in legal jargon of political, economic, and cultural prejudices, will confirm that there is no viable alternative to the new Convention. This, the product of UNCLOS III, represents clear and widely accepted legal principles negotiated by more than 160 nations, large and small, young and old, rich and poor, determined to find solutions to the problems of ocean space, not through unilateral action and retaliation but through the civilized process of diplomatic negotiation.

The opinions expressed in this statement are made in a personal capacity and do not necessarily reflect the official views of the Secretariat of the United Nations.

PART I

DEVELOPMENT OF THE OCEAN RESOURCE INDUSTRY:
THE IMPACT OF UNCLOS III

INTRODUCTORY REMARKS

Panel Chairman Brian Flemming
Stewart, McKeen & Covert
Halifax

The subject of this panel is "Development of the Ocean Resource Industry: The Impact of UNCLOS III." The first panelist who will address you is Marne Dubs, who was educated in chemical engineering at Johns Hopkins University and is employed with Kennecott Corporation. He is the Corporate Director of Technology and the Director of the Ocean Mining Project and chairman of the Kennecott consortium in that area. Among his Law of the Sea activities have been the chairmanship of the American Mining Congress Committee on Undersea Mineral Resources, attachment to the U.S. delegation as an expert, and a member of the U.S. Advisory Committee on the Law of the Sea. And, finally, he's been chairman of the informational international group of ocean mining companies.

The second panelist will be Robert Hage, who is an Albertan, born in Calgary, educated to the B.A. level at the University of Calgary. He received an LL.B at the University of Toronto and then crossed the ocean to acquire an LL. M. at the University of London. He's a member of the Alberta Bar and joined External Affairs in 1972. Since then, he's had important postings to Washington and Lagos in Nigeria, and at the moment is head of the Law of the Sea Section in the Department of External Affairs and alternative representative for Canada at the Law of the Sea Convention.

The third panelist is Gary Knight from Baton Rouge, Louisiana. Gary is on leave of absence from LSU and at the present time is President, Chief Executive Officer, and beneficial owner of all the issued common shares of Jonathan Publishing Company. Gary is a member as well of the Gulf of Mexico Fishery Management Council, to which position he was appointed in 1981 by Secretary of Commerce Malcolm Baldrige.

Our final speaker today is Dr. Harry Almond, who was educated at Yale, Harvard Law School, and at the London School of Economics from which he received a Ph.D. in 1965 I believe. Harry has been a practicing lawyer, has worked in a large corporation at one stage of his career, and for many years now has been a senior advisor in the International Law Section of the Department of Defense. At the moment he is on assignment to the National War College from the Office of Secretary of Defense.

DEVELOPMENT OF THE OCEAN RESOURCE INDUSTRY:
THE IMPACT OF UNCLOS III

Marne Dubs
Director, Ocean Mining Project
Kennecott Copper Corporation

The write up in the preliminary program calling this meeting "a time of special significance for the future of ocean law" was very appropriate in view of the issues of treaty signature, ratification and implementation now before the nations of the world. In particular the question of signature by the U.S. is in the forefront of everyone's mind. The national policy decisions on the LOS treaty that have to be made at this time in all countries are important. Who can say but that the deliberations and discussions of this group and others such as this may significantly influence these decisions?

Ambassador Zuleta in his keynote address this morning seemed to make the point that the Law of the Sea Treaty is a *fait accompli*. I'm not sure that is true. I might wish it were true, but I'm not sure it's true. It is not clear today who will actually sign the treaty or what forces will act to determine the signing of the treaty. I believe this applies not only to the U.S. and most if not all of their major allies, but also to the Eastern European bloc. Furthermore, I'm not by any means convinced that all the Group of 77 will sign the treaty. The four votes against adoption of the treaty made an interesting collection, with Venezuela, Israel and Turkey lined up with the U.S., all for their own separate reasons. This may be repeated many times when the treaty is opened for signature later this year.

Not only do we have the issue of signature, but also the issue of who will then eventually ratify the Convention. When will it come into force? Will the United States be part of this? If the U.S. is not part of it, will the U.S. be isolated? If there are some sticking points in the present treaty, in view of everything now being considered a *fait accompli*, can changes nevertheless be made at this late date? What about ocean mining? What are the opportunities and restraints with respect to ocean mining? What is the impact of UNCLOS III and the present uncertainties on the development of deep ocean mining?

My views on these issues are those of a technologist, in fact of a pragmatist, of one member of industry. I do not in any way speak from the standpoint of one who has served as an expert on the U.S. delegation or as a member of the U.S. advisory committee on LOS. I dissociate myself from those bodies. I want to talk briefly first about the Convention itself, then about the reciprocating states agreement. I will comment on PIP (Preparatory Investment Protection) provisos negotiated by UNCLOS III. Finally, I will attempt to portray where industry really stands, although I doubt whether anyone can actually do so.

It is certainly correct to say that the ocean industry in general, and the metals industry in particular, stands in the middle of a deep depression. The price of copper today, for example, is somewhat lower in constant terms than it was in the depth of the great depression of the early 1930's. Nickel is not much, if any, better off. As you examine the lists of metals and their commercial state, you can see that the world is not crying today for metals. There is overcapacity everywhere.

However, mineral developers must always think in the long terms. We are appalled and disturbed by what happens today, but we have seen these cyclical downs happen before. Although we cannot be sure that there may not have been economic structural changes, we believe in the long run that the world is going to need minerals again, and that the long-term problem will be that of securing adequate supplies at reasonable prices.

Perhaps in starting off, I should discuss the needs of the deep sea mining industry. Even that description is a kind of euphemism. There is no deep sea mining industry. What exists today is a number of companies and organizations that are trying to develop the mineral resources of the seabed.

The needs of the industry I might divide into real needs and what I would call imaginary needs. The real needs and the imaginary needs -- and I'll define these terms in a minute -- have been significantly mixed up in the comments of industry to government and in industry's public statements. I don't have revealed truth, but I at least have recognized this particular confusion.

The real needs, of course, are a stable, adequate investment climate for deep seabed mining that will provide security of contract. This glib phrase means simply knowing that the conditions under which you start operations will continue during the entire life of the operations. What industry needs is a reasonable set of economic terms and freedom from arbitrary interference with its operations. These really are rather simple needs. They can also be expressed by saying that a miner needs to have assurance of being able to recover the minerals from a particular site under known conditions over the length of the project.

There are also imaginary needs which introduce much complication. What is imaginary for one person, of course, isn't always so for another. Industry, particularly the U.S. mining industry, is absolutely, utterly, and completely opposed to the concept of production controls. Any legal document or draft treaty that has production controls in any way, shape, or form is going to be opposed by industry. However, I still put production controls in the imaginary category, because some production controls do not affect the real needs of the industry. In my view, the existing production controls will not seriously affect industry if they are administered properly.

Another problem of industry which may be imaginary, but which is undoubtedly not imaginary for governments, is that of the review conference specified in the treaty. The way I read the review conference article it says that amendments adopted by

the review conference, and subsequently by the required number of states, do not affect any existing contracts. Thus, from the standpoint of industry, this tends to be an imaginary problem.

Well, I could go further down that list of the real and the imaginary, but these examples should suffice. It is this mix of imaginary and real problems that has resulted in the deep sea mining industry's reaction to the law of the sea treaty. The imaginary element to a large extent even outweighs the real.

There is another factor that influences people's reactions. None of us in this room would draft Part XI of the Convention the way it is written. None of us would draft the preliminary investment protection resolution the way it is. It is, of course, incumbent on any negotiator to strive for the most satisfactory document that he can obtain. This effort to obtain the best possible document has been a significant part of the interaction between industry and government, particularly in the United States. I have been a severe critic of the treaty, and in that sense I still am. I believe there are some obnoxious, bad provisions in the treaty; and I will strive until the last minute to get those changed. But at the final "bottom line" (a favorite phrase of Elliott Richardson) we must look to see whether the real needs have been met.

Let's look at the present law of the sea treaty whose adoption was overwhelmingly voted for in New York. How does it measure up? I believe it unfortunate that there are some very difficult problems in the Draft Convention, problems that need not be there. It's a mystery to me how these serious problems have remained in the treaty unless it's a result of misunderstanding and miscalculation.

One of these is the rather simple article on technology transfer in the Annex. It is a monstrosity. However, it is a monstrosity not entirely because of the negotiating skill of the Group of 77. In great part it is due to the lack of knowledge about technology on the part of the people who wrote this language. For example, the definition of technology is so broad and sweeping that no commercial person could sign a contract with that kind of an obligation upon him. I am positive that any commercial lawyer would look at it and say "You can't do that," because the definition is so broad that you cannot be sure what you are responsible for. You may be responsible, to state the extreme, for the commercial success of the Enterprise. Certainly you could be responsible for the Enterprise practicing the technology successfully. Another part of that article has to do with third part technology and the apparent requirement to use only technology that third parties are willing to turn over to the Enterprise. This is a real problem, since the penalty for failing to meet requirements can be loss of contract.

As you have noticed, I have not attacked the idea of technology transfer on any fundamental grounds. We've had technology transfer for many years. We will continue to have it, and I'm not too concerned about that. I think it is regrettable that the technology transfer article was not modified by the Conference. I believe it is a case of miscalcu-

lation, or perhaps a misunderstanding based on ignorance. This article won't fly, will cause trouble, and at the same time it does nothing, in my opinion, for the developing world.

Well, I don't intend to go through the treaty in detail, article by article. However, I do want to note that many of the provisions of the treaty are not really understandable on their own merits. They will only become understandable upon the development of rules and regulations by the Preparatory Commission. I would much prefer to see the treaty text changed so that the Preparatory Commission would have far less latitude in developing these rules and regulations. Nevertheless, in this sense there is perhaps a second chance to make the Convention somewhat more pro-development.

There are several other things about the treaty that I probably ought to mention. One of these is the question of the economic provisions of the treaty that specify the amount of money that the ocean miner has to pay to the Authority. This is either a tremendous problem or no problem. It is a tremendous problem if the ocean miner has to bear these costs as double taxation. It becomes a minor, or almost nonexistent, problem if the countries who sponsor the ocean miner recognize these payments to the Authority as essentially a tax to another taxing authority. This avoidance of double taxation causes great difficulties for treasury agents. However, it is an important issue. In fact the other day I stated that if this double taxation by the domestic government were eliminated, if the technology transfer article were repaired, and if there were participation by the U.S. in the Preparatory Commission to develop reasonable rules and regulations, maybe this treaty would be livable.

However, in saying this, I must note that government has problems that are different from those of industry. I believe the review conference is one of these problems that must be solved.

So where do I come down on the law of the sea treaty? I don't like it. I would like to rewrite it. I don't think it has to be rewritten in accordance with the Green Book tabled by the U.S. at the conference. The Green Book was a stem-to-stern set of amendments requiring changes to almost everything in the treaty. No, I don't think I would rewrite the Green Book. On the other hand, I don't think those who tried valiantly to bridge the gap between the Group of 77 and the industrial countries went nearly far enough with their proposals. However, the technology transfer article proposed by them, with a few little changes here and there, could have been made pretty satisfactory.

I believe the final submission of amendments by the U.S., U.K., Germany, Japan, et al would have done the job very well. If the Conference had seen fit to deal with those amendments, I believe we would have had a treaty that clearly all the Western developed countries could have accepted. At some point, even the U.S. might have also accepted such a treaty, although perhaps not this Administration.

In summary, I would hope that those who really want a universal law of the sea treaty would examine the possibility of changes that would ensure that most industrialized countries can and will sign the treaty and that will make it possible for the U.S. to sign it eventually. My own view is that there is essentially no chance that the U.S. will sign this treaty. I think that this has to be understood and accepted.

I take issue with Ambassador Zuleta that everything was done to negotiate the treaty during this last session. Perhaps it was a miscalculation, but the session started off, of course, with the U.S. pronouncing the President's points. This was followed up by an Issues paper which said, "Here are the issues bothering the U.S. If you can solve these issues in any way, we'll be happy." The Issues paper was then followed, primarily in response to criticism by the Group of 77 that it was too general, by a comprehensive book of amendments (the Green Book), and then by the "Gang of Eleven" paper, and finally by the latter-day proposals by the U.S. and its allies.

In my view, none of these proposals was really considered by the Conference or by the leadership of the Conference. I think that they were basically rejected out of hand, and that they were not entirely taken seriously. This may be too sweeping an indictment, because there were some things done. One of the best accomplishments was a change in the production policies of the Authority. There at last appeared a clear statement establishing production and development as a policy objective. It does not eliminate the anti-production elements, but it's something.

Where will the treaty go from here? I'm not convinced yet that the treaty will necessarily come into force.

I said I would make a few comments on the reciprocating state arrangement and on PIP. Let me talk about PIP first. I believe the preparatory investment protection resolution is a good one. I would, of course, change a few things in it, but I think it does in fact cure many of the problems of the pioneer investors. Certainly our consortium wants to be able to preserve its option to utilize the benefits that appear available under the PIP resolution. However, not all of industry feels that way. I have a paper in my briefcase which roundly condemns PIP as a travesty that conveys no grandfather rights and which opposes U.S. signature of the treaty and the resolutions on the basis that they are unsatisfactory. So there's more than one view on PIP.

Regarding the reciprocating states arrangement, I think that industry by pushing domestic legislation and the reciprocating states arrangements probably did a service to the world community. By so doing, industry made it possible, I think, to keep the developed industrialized states from fighting among themselves over the seabed. The reciprocating state arrangement does provide for solution of conflicts among these countries. However, the reciprocating state arrangement is hung up today on the dilemma of who will sign the treaty, and how the reciprocating state arrangement will affect or be affected by

the treaty. I think this is somewhat unfortunate, because I look upon the reciprocating state arrangement as primarily a means of settling mine sites conflict. From the reciprocating state arrangement, two routes could be taken: entering PIP under the treaty with conflicts resolved, or opposing the law of the sea treaty and proceeding under a mini-treaty. The idea that the reciprocating state arrangement is itself a mini-treaty is completely false.

Industry has not completely depended on governments with respect to settling conflicts. A private arbitration agreement has been developed and signed by the five consortia: i.e., OMA, OMI, OMCO, Kennecott and Afernod from France. There have also been overtures from the Japanese, because this agreement provides a beautiful way of settling conflict among applicants in accordance with the principles of equity, almost exactly like those specified in the PIP resolution. It is a very good system to settle conflict that can fit neatly into either PIP or reciprocating states arrangements.

What are the conclusions? I think the ocean mining industry is in a spot. It really does need a treaty that it can invest under. However, now it is faced with increasing uncertainty. I am, of course, taking the long view because present day economics are not promising for ocean mining. Will ocean mining go forward in the U.S.? Will the U.S. be isolated, but strongly support the ocean mining industry and fight the legal tangle with the rest of the world? Will the ocean mining industry go to West Germany or Japan or France? These questions are not answerable today. This is now a time of special significance and the next six months may determine the stakes in ocean mining.

From the standpoint of my own consortium, I'd have to say that we've got a foot in both spots, because we have filed under national legislation for mining rights in the U.K. and in the U.S.A. The OMI consortium has done a similar thing by filing in the U.S. and in West Germany. We will have to see what happens, but clearly the present uncertainty will have to be resolved or ocean mining will not go forward.

DEVELOPMENT OF THE OCEAN RESOURCE INDUSTRY:
THE IMPACT OF UNCLOS III

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I hope that we all have an opportunity to respond to some of the questions which Mr. Dubs has raised, but I shall address my remarks mainly to the Canadian position. Perhaps I might begin by quoting the May 3 issue of Ocean Science News, which attempts to summarize Mr. Malone's views on seabed mining:

Malone could have said that the treaty really serves the competitive land-based producers of the minerals like Canada, the world's largest producer of nickel, which in the end was able to vote for a treaty which would decrease the chances of new competition while it was sanctimoniously able to point out its allegiance to the developing nations.

I don't think this is a very good example of fine journalism, but it shows how far the law of the sea debate has deteriorated over the last few years that Canada's position can be summed up in one sentence related to a nickel production formula that we neither sought nor consider particularly effective at this time, although we did participate largely in the drafting of a portion of it.

Canada's purpose at the Conference -- and I would think that this would be the position of many countries -- has been to secure certainty in the uses of the oceans. We wanted to have a set of rules, so that Canadian industry, Canadian diplomats, Canadian fishermen would know what the regime was for use in the offshore and in the deep seabed, and on the surface insofar as navigation rights on the high seas and through international straits are concerned. It would be my feeling that a country such as the United States, which is the world's largest trading nation as well as the country with the largest navy, also has the greatest interest in ensuring certainty in the uses of the world's oceans. Whether or not we are likely to have that certainty in the near future is now in question.

In Ottawa recently we have embarked, as many countries have, on a review of our position to determine whether or not we will sign the Convention when it is opened for signature in Jamaica. In undertaking this review, we are not looking initially at the financial implications of the treaty. The U.S. position will have an eventual effect on the future of seabed mining because a great deal of money will be involved to finance the Enterprise once the Convention comes into force after 60 states have ratified it. Signature is not an act that will cost us any money at all. Therefore, our options are open and we're not pressured by the Department of Finance.

In 1958 Canada signed all four of the Geneva Conventions, but we've only ratified one. That's not to say that Canada is contemplating signature of the 1982 Convention without the possibilities of ratification. But they will be two distinct acts, and my understanding is that most of the countries in the Western world treat the two as separate issues.

The theme today is the question of the benefits of the new law of the sea for the resource industry. I want to talk about three benefits that Canada will get from the treaty, although there are, of course, many more benefits than these three. It's always difficult to assess such a question for a trading nation like Canada. No less than 25 percent of our GNP is generated by world trade. Now do you put a dollar figure on having a treaty which guarantees freedom of navigation, for instance? You might say, "Well, that's already part of customary international law." But I think it's valuable to have it in black and white and accepted, we would hope, by the vast majority of states. It's much easier to put a dollar figure on the benefits that have accrued to Canada from the 200-mile fishery zone.

In 1976 the Canadian ground fish catch off Nova Scotia was 469,000 tons, a value of \$93 million. That was before the 200-mile zone. By 1981 that tonnage had almost doubled and the value to Canada has almost tripled. Now we know that the industry is in difficulty, but I think it would be in much more serious difficulty if we had not had that 200-mile economic zone (fishing zone), which is largely as a result of the law of the sea conference. By the way, the total value of Canadian fish products, from both coasts combined, is \$2 billion.

The 200-mile zone has not only given us financial benefits but has also resulted in better conservation. It has eliminated much of the acrimony between foreign fleets, such as the so-called cold wars between Iceland and the U.K. And I think to a large extent acceptance of the 200-mile fishing zone has also promoted more efficient fishing techniques.

Another area of great concern to Canada, as you well know here, is the outer continental shelf, which was perhaps the most vulnerable under the 1958 Convention -- that is, the area beyond the 200-mile zone. About one-third of Canada's continental shelf off the Atlantic coast is beyond 200 nautical miles. While 47 other nations have portions of their shelf extending outside their exclusive economic zone, only eleven have broad shelves with a significant resource potential. Of these, Canada has by far the largest continental shelf, three times greater than Argentina's, three and a half times that of the United Kingdom and the U.S.S.R., and eight times that of the United States. We are also likely to have the best potential for economically viable exploitation of distant offshore resources.

While the distant waters off the east coast are very deep and cold, and thus expensive and difficult to exploit, four major areas have been identified, covering some 180,000 square nautical miles with sedimentary rock which may be favorable to hydrocarbon development. These are the East Newfoundland Basin, which is currently under exploration; the Flemish Basin

southeast of the Grand Banks; the so-called "tail of the bank" area; and the Laurentian Cove. One educated estimate of the potential resources of the outer East Newfoundland Bank continental shelf is upwards of 2 billion barrels of oil. At the current price of \$35 per barrel, this could be worth more than \$70 billion. So this is, of course, a significant benefit for Canada and one which we are very anxious to retain, and that's one of the reasons why Canada has been an active supporter of these law of the sea negotiations.

I should mention that Canada has included part of the definition of the continental shelf found in Article 76 in the Canada Oil and Gas Act. That portion of the definition is found in paragraph 1 of the Article 76 definition:

The continental shelf of a coastal state comprises the seabed and subsoil of the submarine areas that extend beyond its territorial seas throughout the natural prolongation of its land territory to the outer edge of the continental margin or to a distance of 200 nautical miles.

Today Canada in effect has gone a long way toward creating an economic zone on both coasts. Within 200-mile limits we have extended our fisheries protection laws. We have assured control of the continental shelf under the Canada Oil and Gas Act. And the last thing I suppose we have to add is some provision on marine scientific research. Provisions on pollution prevention are already incorporated in the Canada Shipping Act, although they are not being enforced at the present time. Some changes would be required to that law to bring it into line with the law of the sea convention, but that is not a difficult task.

The last area where I think Canada has achieved a certain degree of benefit -- and it is one that was not within our contemplation when we went into the negotiations -- is in seabed mining. Earlier this morning Canada was listed as one of the pioneer states under the preparatory investment protection resolution which was adopted by the Conference at the last session. Canada has companies active in two consortia: Ocean Mining Incorporated where INCO has a 25 percent interest, and the Kennecott consortium where Noranda has a 12 percent interest.

We've had some difficulty, to be frank, convincing states to look at Canada as a potential ocean miner because we have played such an active role over the last few years as a land-based producer. But as time goes on and seabed mining does take place -- and we don't think it's going to take place for many more years -- at that time Canada will have the expertise and the interest to be involved. For instance, I think that British Columbia has the potential to be an excellent site for the processing of seabed minerals. Moreover, there is a provision in the PIP resolution requiring all states whose companies are active in a consortium to ratify the Convention before a pioneer investor can be given production authorization. I think this

will eventually involve Canada, Belgium, Italy, the Netherlands, and other states that perhaps haven't played such an active role in deep ocean mining negotiations at UNCLOS III.

The question, of course, that comes to mind now is whether these UNCLOS III rights are guaranteed under the Convention or under customary international law. Clearly we are in a period of uncertainty. Whereas the Convention and the Conference were intended above all to provide certainty in the law, we now find ourselves in the difficult situation of not knowing quite what the rules might be. The reason for this uncertainty can most unfortunately be attributed in large part to the position of the world's largest maritime power which will not sign the Convention and might even work against it. This position of the United States creates a question mark over many aspects of the new law of the sea -- a question mark which I hope will not be there very long.

Today we are celebrating perhaps an auspicious occasion, because the envelopes indicating the seabed mining coordinates from the four companies which are registered in the United States are being opened in Washington today, and I believe in a number of European capitals, although they may not be made public immediately. Perhaps we are on the road to seeing a mini-treaty established, one which I think would be very unfortunate for the future of the law of the sea.

Reference should also be made to another development in the United States, the bill introduced by Representative Breaux. Apparently this bill is on ice until the U.S. law of the sea position can be resolved. It appears to utilize the same sort of notion as a reciprocating states agreement on seabed mining but applies to the economic zone. In effect, it says, "We will establish an economic zone which might not be compatible with the one in the Convention. We will recognize your economic zone if you recognize ours on a reciprocating basis." This is so unfortunate, because it undermines the whole multilateral approach which was adopted at the Law of the Sea Conference after so many years of negotiations.

We are finding now that states might be inclined to pick and choose amongst those areas of the Convention they like, while rejecting those areas of the Convention they don't like. Canada is not prepared to engage in this sort of exercise, but if we had to examine the question, I think we could justifiably say that our 200-mile fishing zone was part of customary international law. It has been recognized by other states, and is included in bilateral conventions. In my view we'd be on fairly safe ground in trying to exclude states that we had not licensed to fish in that area. The question of continental shelf limits raises some difficulties. I think we again would be on firm ground in the matter of coastal state control of the shelf on the basis of customary international law, but as far as I know the limits formula provided in Article 76 has not been employed yet by any state.

On seabed mining, it is our view that a state cannot engage in such activity unless it's under the terms of the Convention.

States might unfortunately be tempted to argue that they can benefit from the provisions of the Convention governing transit passage (which again I think is an area which is not part of customary international law) while rejecting other provisions of the Convention such as those on seabed mining and operating on their own through a reciprocating states agreement. If so, uncertainty is created and the sort of objective that we had hoped to attain in the Convention has been eroded. On the other hand, some states such as Brazil which have a 200-mile territorial sea but have indicated that they would retreat from that position once the Conference had been concluded, might be tempted now to retain their claim to a 200-mile territorial sea until this period of uncertainty has passed. Instead of creating a system of rules and regulations, we seem to have created a system of chaos.

I think the London Times summed up the matter quite effectively in a recent editorial:

If the rich countries were to adopt a mini-treaty on their own and unilaterally begin mining what does not belong to them, the effect on international relations could be devastating. The military inferiority of the third world states rules out any resort to gunboats, but anarchy would reign over virtually every aspect of maritime activity.

In Canada we hope that this will not be the case, that all states will consider the Draft Convention on the Law of the Sea to be to their advantage and will sign and then ratify this important document.

THE IMPACT OF THE LAW OF THE SEA CONFERENCE
ON OCEAN INDUSTRY: OR, THERE IS SUCH A
THING AS A FREE LUNCH, AND CAPITALISM
IS PAYING FOR IT

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My assignment today is to make some stage-setting remarks about the impact on ocean industrial enterprises of the Third U.N. Conference on the Law of the Sea. I am going to take this opportunity to assert some self-evident truths that have apparently become something less than self-evident to a vast majority of people and nations of the world in the past few decades. As a general proposition I want to look at the idea that there is a way to get something for nothing, and to suggest that the end result of this philosophy is in fact to wind up getting nothing for something.

There are two types of players in the world -- creators and regulators. Creators are those who make things of value where none existed before; that is, things for which other members of society are willing to exchange something of value of their own in order to possess. Regulators, on the other hand, do not create anything of value, anything new, but simply redistribute what already exists and impose additional costs on various aspects of creators' enterprises.

Who are the creators and the regulators? Generally, the creators are individuals who begin with an idea, convert that idea into something tangible through individual effort, expense, and risk and then market the final product, hopefully at a profit. The regulators are, by and large, persons affiliated with governments.

We must understand that governments never create anything of value but only diminish value. Whether they impose costs on the creators' efforts, or debase the value of all our assets through irresponsible monetary policies, governments, through the act of regulation, only inhibit the process of creation of value.

When we seek to answer the question, "What is the impact of the law of the sea negotiations on ocean industry," we can only conclude that the process has inhibited the creation of value which would otherwise have benefitted mankind. The Third United Nations Law of the Sea Conference is a process of governments establishing more government. The effect is a regulatory one, not a creative one. By way of contrast, we have a range of industries -- including deep seabed mining, offshore oil and gas exploitation, fishing, and so on -- which seek to create value by risking capital, technology, and managerial expertise in hopes of obtaining a reward, a return on that risk investment, as compensation for providing something of value to society. Understanding this, then, we can see conceptually why the only

Impact of the Law of the Sea Conference on ocean industry has been one of inhibiting the production of value.

Why, you might ask, would any individual contribute to the process of government or be a regulator rather than a creator? The answer lies in the fact that the primary function of government has become the redistribution of existing values. Many people think that the capitalist, free market distribution of values is inequitable and that their own personal judgments about that distribution are superior to the natural market place. As one might expect, there are many individuals with differing perceptions about appropriate distribution mechanisms. When they engage one another we have what is called diplomacy or the process of government. Thus, the Third Law of the Sea Conference has been a process of competing policies with respect to the allocation of value. What must clearly be understood, however, is that this exercise itself is creating no new values and, indeed, by this very existence, is diminishing the value that the creators would produce, were they left unattended by the regulators.

No man has a right to the fruit of the labor of another man. One may purchase the fruits of another's labor for whatever value the producer is freely and without coercion willing to accept. One may accept a donation of it if the producer so chooses. One may take it on terms and conditions specified by the producer, however onerous one believes those terms and conditions to be. But one has no right to something that has been created by another. This is a fundamental law of nature and fundamental principle of all human endeavor. Yet the rhetoric of Marxism -- to each according to his needs, from each according to his ability -- tends to make some of us oblivious to its essential truth and merit.

No nation has a right to the values to be won from the sea by others. That is so simple in concept, so simple in its truth and merit, that one would not expect contradiction. Yet the underdeveloped nations have claimed that they have a right to some share of the resources produced by others' capital, effort, intelligence, and spirit of adventure. To me, that is declaring a right to steal -- nothing more or less.

Let me suggest an analogy. If everyone in a hypothetical society, by virtue of a democratically enacted law, paid \$1,000 to the state, and the sum total were used to promote the national defense, you would have an acceptable system of taxation. A percentage -- or worse, a progressive -- income tax is, however, nothing more or less than stealing. When you take \$5,000 from a few people, and only \$100 from a great many people -- because the majority has established such a system (de Tocqueville's "tyranny of the majority") -- and those funds are redistributed among the contributors so that those who made the large contributions are "donating" their earned capital to those who made smaller donations, you have the "Robin Hood effect" under the guise of the democratic process.

As for the proposed seabed mining regime, if every nation were to contribute an equal amount of capital, if that money

were to be used exclusively to mine seabed minerals, and if the minerals and net profits of that operation were distributed in equal shares among all nations of the world, then you would have a fair and moral system. To the extent the majority legislates that the minority must contribute massive sums of money, technology, and expertise, to be redistributed to the non-contributing majority, you have a system of stealing under the guise of a democratic process -- nothing more, nothing less.

Capitalism is the most equitable, the most moral economic system ever devised on this planet. To the extent capitalism has gotten a "bad name," it is due to the same phenomenon that has given other phenomena "good" or "bad" reputations contrary to the facts, namely, a very sophisticated process of disinformation. To the extent you believe that colonialism was without its compensating benefits, or that multinational companies have not brought benefits to people unparalleled by any indigenous government programs, or that capitalism is evil, you have simply been the victim of this long-standing system of disinformation. I suggest in the words of the popular retort, "Don't knock it if you haven't tried it."

If I were to subtitle the so-called "new international economic order," I think I would use the phrase "Or, How To Get Something for Nothing on a Global Scale." The NIEO is not a plan for producing. It is not a plan for generating wealth or value. It is a plan for first diminishing and then shuffling around what already exists, which is a polite way of saying stealing from those who have and doling out on a gratuitous basis to those who have neither the energy nor the will to produce things of value for themselves. That is a harsh but deadly accurate characterization.

Whenever you see the phrase "new international economic order" you should immediately substitute the phrase "plan to get something for nothing on a global scale." That will end the obfuscation and lay bare the ultimate Marxist, collectivist goal of this proposed reformation of the world's political and economic system which has manifested itself so clearly in the LOS negotiations.

It is not surprising that the vast majority of third world nations support the NIEO and its manifestations in the Third U.N. Conference on the Law of the Sea. After all, virtually all of these countries have centralized, planned economies and virtually all of their leaders have been educated in the virtues of Marxism, collectivism, and socialism. They have not practiced capitalism. They have seldom been educated in, nor do they appreciate the virtues of, that system which creates new values and wealth for society by rewarding the intellectual, economic, and technological creations of individual members of that society.

If anyone here has any doubt that my characterization of the new international economic order is accurate, let them read the founding documents of the NIEO, namely the Declaration and Program of Action on the Establishment of a New International Economic Order (Gen. Ass. Res. 3021) and the Charter of Economic

Rights and Duties of States (Gen. Ass. Res. 3281). The latter calls for, among other things, establishment of the right to nationalize and expropriate foreign property without payment of compensation; the right to form commodity cartels with arbitrary price and production control mechanisms; a one-nation one-vote system for international decision-making in economic, financial, and monetary institutions; general and complete disarmament with the resources released by such measures to be allocated substantially to developing countries; favorable treatment in trade to socialist countries, even though market economics would dictate trade with developed market economy countries; non-discriminatory and non-reciprocal foreign trade preferences in favor of developing countries; and adjustments in prices of exports of developing countries in relation to prices of their imports.

Notice that each of these objectives is directed not at generating or creating new wealth or values for mankind but at diminishing and reshuffling what already exists. This is, as I have said, simply a plan for stealing from those who create and distributing to those who do not create.

I wonder how things would be today if all of the otherwise able and intelligent regulators involved in the law of the sea negotiations were to have spent their time since 1967 trying to create things of value for mankind instead of engaging in regulatory activities. This thought occurred to me recently, while reading an excellent book examining the possibilities of interstellar travel and the building of a starship for that purpose. The author said:

We will build a starship some day ... because we are planners and practical explorers and capable of sustained drives covering more than our lifetimes. We are dreamers, too, and the stars are a wonderful dream.

I do not think the author had ever heard of the Law of the Sea Conference! Or of the Moon Treaty! Of the hoards of regulators waiting in the wings just for such an opportunity -- an opportunity to seize upon and inhibit and reduce and redistribute the value of such a monumental and breathtaking enterprise.

Another of the ways in which the regulators inhibit development of value is by attempting to remove all risk from venture capital enterprises. The most common example of this is, of course, the environmental protection movement, but it takes other forms as well. The same author I quoted a moment ago had the following perceptive comment about the efforts of regulators in our society who seek to limit risks:

We reach with a collective longing for a world in which our cars are made safe beyond our ability to drive them; we want to be protected from any remote chance of unforeseen effects in our medicine, our

food, the environment. Some do not want the risk of nuclear energy. The underlying idea of "no risk" is in itself dangerous. No progress was ever made without risk, both individual and collective.

Creators are, by definition, risk takers. They are willing to risk their own ideas, their own capital, their own security in all forms, for the rewards of producing value. Regulators, perhaps because they are incapable of genuine acts of creation, seek to strike back at the creators by demanding that all of their activities be as risk free as possible. Of course, no value can be generated without risk taking, and if sufficient risk inhibiting mechanisms are installed, no progress will be made, no value will be generated. The Law of the Sea Conference has been a classic exercise in risk inhibition. It has been an exercise in planning, planning, planning. But by seeking to make ocean activities free from risk, we severely limit the potential of the ocean to produce value. In the terms of biological science you are creating an environment in which creators -- entrepreneurs -- will, through the process of natural selection, be selected out. You are, in a literal sense, killing the goose that lays the golden eggs. We risk winding up by getting nothing for something.

A final thought -- writers such as George Orwell, Ray Bradbury, Ayn Rand, and Aldous Huxley have described alternative futures in their books 1984, Fahrenheit 451, Atlas Shrugged, and Brave New World. Recall that all of these societies are characterized by totalitarian governments and by extremely limited or non-existent individual liberty. It is interesting to observe that in each case the end result was the product of regulators seeking ultimate control over creators.

What you may have regarded as a laudable exercise in UNCLOS III can also be viewed as simply one more step in the process of ascending regulation and descending individual freedom and enterprise. Mark well the lesson of Atlas Shrugged -- if the regulators achieve their ultimate goal, there will be no more reward for risk-taking, there will be no more creators, there will be no more new things of value, and civilization will stagnate.

I urge the regulators here today (and who read this paper later) to make a new commitment, to establish a new goal -- that of maximizing individual liberty and maximizing the opportunities for risk-takers of all kinds. Eschew regulation unless absolutely required, and then only with the consent of the regulated. Stop trying to "create" idealistic edifices -- leave that to the real creators, for they will, along with their material contributions to society, also develop a framework in which those contributions can best be distributed.

In short, and to paraphrase Ayn Rand, "Get out of their way!"

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DEVELOPMENT OF THE OCEAN RESOURCE INDUSTRY:
THE IMPACT OF UNCLOS III

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What I want to do today is to discuss another perspective, a differing perspective than that which you've already heard. The reason for this I think will become obvious as I pursue it. But very shortly it is this: What we're trying to do, and with all respect to Gary Knight, is to establish some sort of a public order in the seas, to use Myres McDougal's phrase, in which the enterprising activities to which he refers can take place on a basis in which conflict is limited.

So to that end, the regulator is not only essential but critical. He is critical in a very real way, because if we have chaos on the seas the enterprise will simply never come to life. Although I hold myself out as a conservative, I take that very strong view with respect to the development of the law of the sea.

It has been suggested that I give some kind of a theoretical base or framework to what we have been doing in the law of the sea. To do so comprehensively, of course, would be a task not only beyond my present competence and background, but it would take far more time than I think we can spend here. Instead let me limit myself to a few comments on the strategic implications of UNCLOS III and of the kind of law-making that it represents.

The problem of re-making the law of the sea by global treaty processes might be described as a "wicked" problem, as distinguished from a "tame" problem. It is "wicked" because it is a problem of organized complexity, a problem which has no solution. It is a problem which calls for eternal vigilance to fulfill our reasonable expectations for a well running and effective law of the sea.

My own background tends to pull me more toward the notions of McDougal, which would favor development primarily through the customary international law. Although UNCLOS III took place for a decade or so, it came hard on the heels of the 1958 Geneva Conventions. This is after all a relatively short period when compared to the millennia by which our customary international law of the sea came about. I have no hesitation in suggesting that the customary international law process will continue, whether or not a treaty is ever concluded on the law of the sea or, more particularly, whether the United States ever ratifies such a treaty.

It seems almost impossible to apply any test for a treaty of this kind, because the basic juridical issue is a "wicked" problem. There's no way really we can come to grips with it. However, we can ask whether the treaty is stabilizing or destabilizing in the relations among states today. Let me

suggest some of the strategic dimensions, and let me also say at the outset, that these are obviously my personal view. We are all creatures of our own perspectives.

The strategic significance of the current debate in the law of the sea lies in the fact all states together participate in the establishment of arenas, procedures, institutions, and processes for one thing more than any other; and that is for shaping world community policies and arguing an influence over one other. The duality is inherent in the state system. None of us will live to see that process disappear. The struggle for influence will continue as long as military adventures are tolerated and not resisted, regardless of what state engages in them.

Today, as a result of UNCLOS III, the sea is more substantially enclosed than ever before. We all know what the charts look like. The geographers have shown us what the impact of the exclusive economic zone is. In light of the "sovereign rights" language in the treaty, there is a strong possibility that some coastal states will be tempted to convert their exclusive zone into a territorial claim, at least on a de facto basis.

A second impact of UNCLOS III is the increased participation by non-maritime states in decisions affecting use of the seas. Of course, that appears mainly in the mining section, but it also appears in a few other areas of the Convention.

A third impact is the precedential element alluded to by several other speakers. UNCLOS III may result in precedent with respect to other common spaces such as Antarctica and outer space, as well as to the new international economic order, the new international information order, and other contexts advanced for law reform.

A fourth strategic impact was brought up by our main speaker earlier this morning, by Dr. Zuleta, and that is a new shift -- I don't think it's a total shift -- toward treaty law as opposed to customary international law. And any of you who have read the long debates between McDougal and Tunkin on the notions of the development of the law will see that this has certain strategic implications even in a context of technical legal arguments. It was Tunkin's view that among sovereign states one establishes new law on a consensual basis, relying heavily on the sovereignty of states. Anyone accepting this view will obviously attach the greatest weight to acts of signature and ratification in the new law of the sea, and thereby tend to create difficult issues in treaty law rather than build on customary international law.

Finally, I should like to emphasize the impact that UNCLOS III might have on the United States, by drawing world-wide attention to our failure to ratify major treaties. What has happened with our major treaties now sitting on the books of the Senate Foreign Relations Committee? Where is the Genocide Treaty? What about the treaty of the Geneva 1977 Protocols for supplementing the law of war? How about the Vienna Convention

on the Law of Treaties? What about the SALT treaties? Every one of those is a major treaty. There are numerous others. Not one of them has been ratified except for SALT I and the ABM Treaty, and SALT I, as you are aware, has expired. So we're compelled in the United States to recognize a major reality. The lobbies in the United States are frequently able to block the ratification of major treaties negotiated in good faith by the executive branch of government, if one of these interest groups is unsatisfied with some feature of the text.

In closing, perhaps I might take a look at what effect UNCLOS III might have on future military activities on the seas. The first of the missions of the U.S. Navy is that of strategic deterrence; in the words of Admiral Turner :

A mission to deter all-out attack on the United States or its allies, to face any potential aggressor contemplating less than all-out attack with unacceptable risks, and to maintain a stable political environment within which the threat of aggression or coercion against the United States or its allies is minimized.

Conceivably UNCLOS III may change the way in which the strategic deterrence missions would take place in the future, because with the extension of jurisdiction and control and certain sovereign rights into the exclusive economic zone, this necessarily means that coastal states which are neutral in a future conflict can also be in a position not only to police that zone but to deploy in peacetime the necessary means to police it. And those capabilities might take the form of formidable technologies such as improved sea mines, torpedoes, and cruise or ballistic missiles readily fired from shore or near shore*. So what we envisage is the strategic deterrence missions of major states (the United States or the Soviet Union) substantially affected by this new development. These changes will not be confined to those states which choose to accept the Convention. Both directly and indirectly, UNCLOS III will force the major powers to find other ways of conducting their own strategic deterrence missions.

Other missions, for similar reasons, are also affected. Sea control missions, of course, involve our allies, our own resources, and our effective naval combat. But the emerging law of the sea, partially established in the law of the sea treaty, partially to be developed in the future, will draw attention to the "choke points" that naval forces try to transit in wartime: international straits, archipelagic waters, and exclusive economic zones. Similarly, the other missions of the U.S. Navy, projection of power ashore, and the peacetime activity of navies associated with the diplomatic or "naval presence" use of the navies, will also be affected by UNCLOS III. Perhaps they will be affected, to our overall benefit, by deterring war, but there is the alternative possibility that these changes may lead to an increased use of exotic technologies that will make warfare, if

it ever does occur, more destructive, more clandestine, and more emphatically directed by strategic considerations than in the past.

*None of these comments, positions or statements made in this paper constitute in any way the position of the United States Government, or any of its agencies, nor reflect those as stated to the author by its public officials. They are the personal observations of the author, and have been drawn entirely on unclassified sources.

DISCUSSION AND QUESTIONS

MARNE DUBS: I want to comment on a point raised by Mr. Hage. In talking about the present period of uncertainty in the law of the sea, he indicated that the present dilemma is attributable to the U.S., and it is in many ways. But, on the other hand, that's not a fair and reasonable statement either, because for a number of years the difficulties of the U.S. were made clear. I think a large part of the blame is also attributable to the Group of 77, in the sense that it takes two sides to create an argument. In these concluding weeks of the Conference the Group of 77 may well have concluded that there was no way to get the U.S. into the treaty. If that is the case, they probably made it impossible for those in the U.S. who are pro treaty to make a case that could move the U.S. government in favor of signing the treaty. So it's not a one-sided affair.

ROBERT HAGE: Perhaps I could just add a comment. The United States was the one that asked for a vote at the last session. No other country would have done so. I understand the President of the Conference had made an arrangement with Venezuela, Turkey, and Israel whereby they agreed not to demand a vote. I believe that vote is regrettable and that it will hover over the United States for many years to come. Even the moderates in the United States will have to overcome the fact that their government voted against the adoption of the treaty.

Anyone can accept that the United States might not sign the treaty. It's more difficult to accept the United States not actually having taken that position yet but actively investigating a means of setting up a seabed mining regime in competition with the one under the treaty. That is the damaging aspect. The United States hasn't made that move yet, and I think all of us hope that it will not.

Certainly in the negotiations there was mistrust and misinformation on both sides, and I think that's regrettable. A number of us did expect in the final stages of the negotiation that there would be changes on transfer of technology and on the review conference along the lines of the proposals made by the Group of Eleven, but it was not possible to get the Group of 77 to agree to those changes. They had unfortunately taken the view that these were ideas which the United States had in a large part originated. I think it is accurate, as you suggest, that at that stage there was no hope of bringing the United States to sign the Convention. So why make further changes which would erode what they had already been granted under the Convention?

There was some talk at the end of the session about possible changes to the text. We hope that that possibility still exists -- but we recognize that the potential for changes in transfer of technology and the review conference over the summer, perhaps in the Drafting Committee, are very slight indeed.

EDWARD MILES: I have long thought that the ocean mining industry, from an economic point of view, is a very small tail wagging a very large dog. And the dog, of course, is the revolution in coastal states' rights, which is the heart of the new ocean regime. Now a lot of comment has been made that UNCLOS III is the death knell of the ocean mining industry. I don't think the evidence supports that point of view.

If one looks at the economics, and admittedly as an outsider one's access to the numbers is much poorer than the industry has at its disposal from the inside, it seems that the total operational costs are so heavy relative to the potential return that irrespective of fluctuations in price for the component metals, this is from the point of view of shareholders a marginal economic activity at best. Whether or not the price of copper or nickel increases significantly in the short-run, the prospects for investment in ocean mining do not improve, no matter what happens in the Conference.

Secondly, as the price increases for copper and nickel, I wonder what is the potential competition between mining of laterite deposits and deep ocean mining.

And thirdly, I wonder what is the potential competition for mining within 200 miles versus mining in the International Area. Would Marne Dubs comment on these points?

MARNE DUBS: The first point I would restate in terms of a question -- Is ocean mining economic? Are the rewards worth the risk? There will be different views of this, of course, among the various companies, and I am no more privy to their numbers than you are. But I would point out that ocean mining has an enormous risk to start off with. It's not just the law of the sea, the legal and political risks that we are talking about, but there are also enormous technological risks. Now these aren't the state of the art technological risks that we talk about in going to the moon or to Mars or Jupiter, or even in building a new computer of greatly enlarged capability. But they are risks of operating in what is really an unknown environment.

The end result of that is that in order to tackle ocean mining, you would like to minimize as many of the risks as you possibly can. Another way of stating it is that the amount of risk you take is dependent on the rate of return.

In my first public comments on ocean mining, I stated that the economics of ocean mining are not a revolution. And by economics, I mean costs, not returns, because it's only cost that one can really deal with at any one time. You can deal with costs as well in a depression as you can in a boom time. The cost of ocean mining is not a revolution. It will not displace present day mines, nor will it be more economical than high grade new deposits that are discovered. If in Canada we should discover a new Sudbury, it could out-compete ocean mining on a cost basis with no difficulty.

But on the other hand, if one looks at the resources around the world, my conclusion is that there is a time when one looks

at production capability and at market demands, when ocean mining will be the low cost way of producing these products. It is only for that reason that we have pursued it. That time is not now. In 1970, before the oil crisis, before we entered into a period of stagflation, I would have said it would have been by now. But that time will come, and it will be economically viable. Anyone who says there will be ocean mining in the next five to ten years is not looking squarely at the economic facts as they now exist. So short-term, ocean mining is in trouble; long-term, it will compete handily. Or another way of expressing it, the short-term predictions of the amount of ocean mining are inflated and overly optimistic; the very long-term are probably too pessimistic.

With regard to the laterites -- and this is part and parcel of the same thing, because it is the laterite supplies that are the competitors for ocean mining -- I'll try to be a little bit more quantitative. I think if we had a "good" laterite -- and I'll put that term in quotation marks so that I don't get into trouble with some of the technicians in the audience -- if we had a material that, let's say, was 2 percent nickel, and if we did not have to depend on high price oil, it would be preferable to nodules. But, on the other hand, if we find after a few years that we are dealing with lower grade materials, nodules will compete effectively with laterites. But this is conditional on one proviso: we must avoid the double taxation that's now implicit in the law of the sea treaty.

With respect to the 200 miles, I'll make that very brief. At present there are no nodules within the 200 miles that are likely to be valuable. The polymetallic sulfides are exciting science. They're exciting geology. They may even be exciting science fiction. But it is difficult for me to get excited about the economic potential of those materials. From every indication today, although there may be high grade deposits, they are relatively small. They do not involve a simpler mining technology than the nodules. It's more complicated, more difficult, and I can't see their economic impact for a long time. A lot more research is needed to understand their true potential.

BERNARD OXMAN: I have a question for Marne Dubs. I think there are very few people in the room who, whatever position they had at the outset, are wildly enthusiastic about the end result on deep seabed mining. There is, however, a problem in evaluating the result. And that is that the Conference did something astonishing in the very last session, in adopting a resolution on PIP and in incorporating everything done in PIP by reference into the treaty, so that it retains full legal validity under the treaty. One of the problems I think we all have is in evaluating the impact of that. What I would propose to do is to read you a quotation of one evaluation of that effect and to elicit your comment on it.

The evaluation is as follows: "Under this resolution, four existing mining consortia, each of which includes or is

controlled by U.S. companies plus projects sponsored by the governments of Japan, France, the U.S.S.R., and India would have guaranteed automatic access to the strategic raw materials of the seabed for the first generation of seabed mining. Altogether, ten seabed mining entities are entitled to all the mineral production likely or possible from the seabed for the next 30 to 50 years. Metal market projections indicate that demand for manganese, copper, cobalt, and nickel from the seabed is unlikely to reach, much less exceed, the production capacity of these grandfathered miners during that period. Thus, with the notable exception of mandatory technology transfer and the procedure for amending the treaty, the offensive ideological provisions of the treaty would not effectively apply before the middle of the 21st century."

I'm wondering, Marne, if you could comment on that.

MARNE DUBS: I think I recognize the paper.

(Laughter)

I think the paper is in excess. The statements are so sweeping -- the middle of the next century, and that sort of thing -- and comments on supply and demand which none of us can guess at, that it would be difficult for me to endorse those statements in their entirety. But at the same time, there is a hard core of reasonableness to that statement in that the PIP resolution (and I'll overlook all the moles and warts I'd like to remove) does in effect solve a problem of access in the near term. I can't look out 30 years. I have difficulty looking out five or ten years. But if the treaty were adopted today, came into force today, and if, say, the first commercial operation were in 1990 -- because I think it would be physically impossible to get one in operation before 1990, even if you decided right now to do it -- then I suspect that over the next 20 years after 1990, let's say clearly over the next 10 or 15 years, there would be no problem with the production allocation.

Now we could argue about several points which are not clear in the PIP article. First is the rather open window for developing countries. There's an open window there that's not very well defined. I wish I knew what that were. But if the Preparatory Commission acted promptly, maybe there wouldn't be a problem. But I have a slight reservation. If we say there aren't many that come in that window and that window is taken care of, then I think all those that are most likely to exploit the seabed, certainly in the next 15 years or so, are going to have a chance to exploit it.

Now there are some problems that are unsolved, because under the terms of the PIP proposal -- and this has bothered some of my associates in other groups, not in our own consortium although we are concerned -- it is mandatory to comply with the rules and regulations adopted by the Commission. I do not know what they will be. One of my problems has always been that they could be almost completely satisfactory, or they could be awful, horrible. So that from that standpoint, the PIP resolution, as good as it looks, could be ruined by the development of those

rules and regulations.

I'm not sure I answered your question, but I think the PIP proposal is good and has gone a long way. From a very personal point of view, I felt that prior to this PIP proposal our consortium should not spend any money on ocean mining until we actually had a contract in hand, because there was no way of knowing whether we'd ever get one.

BERNARDO ZULETA: To Mr. Almond, the question is whether he seriously believes that in an international community made up of 150 nations with different legal, political, and social systems, customary law is a reasonable means of developing international relations -- customary law by itself without any reference to agreements, negotiations, or any form of diplomatic exercise.

HARRY ALMOND: There are 160 nations that have come together for UNCLOS III. I forget how many came together for the United Nations. The United Nations at present is beginning to wobble and fall apart. Many of you may disagree with this, but it is surely through its practice not fulfilling the expectations that many of us who lived through that period had for the future development of international law and a more acceptable world order. I guess I'm among those who are called realists as against those who are called utopians or idealists. I fear that notwithstanding the great interest of 160 nations in this treaty, most of them dislike certain parts. We heard the Canadian view and we heard the benefits that the Canadians would like to see from the treaty. I believe other nations have their likes and dislikes, but I believe they're disparate, disparate to the point that the international tensions generated by these differences have not been resolved. I regret this is so.

My great fear is that we are going to land in the same situation we found ourselves in at the United Nations, and that this tremendous competitive urge among major powers has not been quieted. I don't believe that a major treaty of this kind will be able to help us resolve those tensions. I regret to say I find the Convention for those reasons destabilizing. A detailed answer to it I'd have to give you later.

JOHN BAILEY: Before I address a question to Marne Dubs, I'd like to comment on Gary Knight's view of history. Capitalism could not have thrived, nor even survived, in the 19th and 20th century without the legal system which backed it up. And who are the creators of this legal system? It was not the innovators but the regulators. And likewise it was the regulators that produced the legal system contained in the law of the sea convention, and it is that system which will enable the users to fully exploit their own creativity.

But I have a question to Marne Dubs. He said that with the present uncertainty, ocean mining will not go forward. Now I ask, Marne, what is the industry trying to do with a view to obtaining changes in the transfer of technology provisions in the present Convention? Has it consulted with the U.S.

Administration in an effort to obtain any alterations in the text along the lines of that produced by the Gang of Eleven? Such changes could not be obtained without an assurance from the U.S. Administration that it would sign the text with those changes incorporated. Has industry consulted with the Administration with a view to getting changes in the text, or has it concluded that the present U.S. Administration is not interested in signing the treaty in any event?

MARNE DUBS: The American Mining Congress is the biggest segment of industry that deals with this subject, but we have yet to establish a total industry position on the law of the sea treaty, as it was adopted in New York. We will eventually do this, but it won't occur overnight. So in the meantime, as an industry, we're not doing anything.

Secondly, among the ocean mining consortia in the U.S. there are differences of opinion. A significant segment of the industry has been urging, and undoubtedly will continue to urge, the government not to sign the treaty. This group is relieved from their point of view that it's gone away. From my own point of view, I have not taken up the lists in any way regarding that matter, except that as I have interacted at the government level, I have tried to urge action in that area. But I've not taken up any lobbying activity.

In summary, I think it is unlikely at this stage that industry as a whole is apt to urge the government to make a few changes in the treaty and then go forward.

BRIAN FLEMMING: Thank you very much. Well, the time has come to end this session. I'd like on your behalf to thank each and every member of the panel. We had a mission which was designed to stir you up a bit in the first morning. I think we might have succeeded in doing that. I want to thank you all very much for your attention.

PART II
THE EMERGING PROBLEMS
OF
MULTIPLE-USE OCEAN MANAGEMENT

INTRODUCTORY REMARKS

Panel Chairman Edward Miles
Institute for Marine Studies
University of Washington

The focus this afternoon is on the emerging problems of multiple-use ocean management, which are conceptually among the most difficult problems to deal with, in the current period.

The first presentation will be given by Professor Timothy Hennessey, who is Professor of Political Science, and an Associate of the Center for Ocean Management and of the International Center for Marine Resource Development at the University of Rhode Island. Professor Hennessey will discuss the general issues in his paper, which is entitled "Multiple Use of Ocean Resources: Some Theoretical Considerations."

Professor Tullio Treves, who comes second, is Professor of International Law at the University of Milano. He has been a member of the Italian delegation to the Law of the Sea Conference, and also the coordinator of the French language group on the Drafting Committee. His paper, entitled "Accommodation of Multiple Uses of the Seas in International Law With Special Reference to the Mediterranean," will deal with legal aspects of the problem and review some recent developments in the Mediterranean region.

He will be followed by Dr. Alastair Couper and Hance Smith of the Department of Maritime Studies, University of Wales Institute of Science and Technology. Professor Couper is the head of the Department of Maritime Studies, and Dr. Smith is Lecturer in maritime geography. Their paper is entitled "The North Sea: Bases for Management and Planning in a Multi-State Sea Region."

The commentators will be Dr. Steinar Andresen, who is a Research Associate of the Fridtjof Nansen Foundation in Norway, and Professor Douglas Johnston of Dalhousie University.

We have the whole afternoon for this panel, so there will be ample time for discussion from the floor as well as presentations by the panelists. I now call on the first panelist, Professor Hennessey.

MULTIPLE USES OF INTERNATIONAL MARINE RESOURCES: THEORETICAL CONSIDERATIONS

Timothy M. Hennessey
Center for Ocean Management Studies and
International Center for Marine Resource Development
University of Rhode Island

INTRODUCTION

Multiple use of ocean resources is a complex topic indeed. A book length manuscript might just begin to do justice to the topic. A comprehensive treatment of the topic is, therefore, clearly beyond the scope of a conference paper. In recognition of these limitations, this paper is confined to introducing and utilizing several concepts from the public choice literature in order to clarify selected issues of multiple use.

In considering this problem some preliminary clarifications are in order. We should initially acknowledge that we can have situations of multiple use in which users concentrate on a single resource within a single jurisdiction, or we can have extraordinarily complex situations in which multiple users utilize multiple resources across multiple jurisdictions. There are obviously combinations of circumstances between these two extremes in which, for example, multiple users attempt to utilize a single resource with no appropriate jurisdiction.

Given these preliminary distinctions, in our discussion we shall consider: a) the number of users, b) the number of uses, and c) the number and appropriateness of the jurisdictions involved. We shall confine our discussion to the following resources: 1) fisheries, 2) off-shore hydrocarbons, 3) the ocean environment, 4) deep-sea minerals, and 5) marine science. These issues will be considered in the context of international relations.

The paper will address the following questions:

1. What are the characteristics of these resources?
2. What are the fields of effects and boundary conditions of these resources?
3. What is the degree of interdependence/jointness exhibited by these resources, as they are utilized among and between uses and users?
4. If there is interdependence, is it positive or negative?
5. If there are spillovers, can the associated costs be reduced through the use of institutional arrangements within existing jurisdictions, or are the boundaries of existing public agencies either too small or too large to internalize the problem?
6. If the latter is the case, are new institutions, either regional or global, required to minimize negative effects? If new institutions are called for, what are the concepts

which will inform judgments regarding the advantages/disadvantages of alternative institutional arrangements?

SELECTED OCEAN RESOURCES AND THEIR CHARACTERISTICS [1]

Traditionally, oceans have been viewed as consisting of common pool resources. We shall analyze the oceans from this perspective first, because such a treatment permits an introduction of the basic concepts in terms of which the general resource discussion can proceed.

Common pool resources are those for which no property rights exist but which are available to all for exploitation. They are basically open access pools of depletable resources. The fundamental features of common pool resources are non-exclusion and interdependence of users. Since no property rights exist (i.e. all is held in common), exclusion is not possible.

Given these conditions, it is expected that individual entrepreneurs will exploit common pool resources to their advantage, thereby bringing about scarcity, "crowding effects" among the users, and, ultimately, social conflict.

Deep-Sea Minerals as Common Pool Resources

Deep-sea minerals are clear examples of common property resources. In the utilization of such resources, there is a great deal of capacity for interdependence and "crowding" among potential users but not necessarily equality of consumption: that is, the value of the resource is subtractable as capacity is approached leading to a deterioration in the resource. Thus, for common pool resources without clearly agreed upon rules for use, consumption of the good is subject to the rule of capture.

The interdependence which is characteristic of such resources is by no means benign; it exhibits a rivalness, and ultimately, a social conflict feature. As the quality of the resource deteriorates and social conflict mounts, we have the potential for what is referred to as "the tragedy of the commons."

"The tragedy of the commons" can only be avoided if there is an agency established with the power to coordinate or ration the use of the resource. Indeed, it is precisely the nature, composition, and rules for operation of such an authority which has created difficulties for the U.N. Conference on the Law of the Sea with respect to the exploitation of deep-sea ocean minerals.

This brief discussion of common pool resources has served to highlight several concepts which will be used in what follows to consider other ocean resources: namely, 1) jointness/interdependence, 2) exclusion, 3) property rights, and 4) the necessity for a public agency to collectively manage the resource. Figure 1, which follows, uses the first two concepts to locate ocean resources. This figure will also be referred to in the discussion of other resources.

Figure 1.
Types of Marine Resources by Degree of Excludability
and Interdependence/Jointness

		Interdependence	
		Low	High
Possibility of Exclusion	High	<p>Cell A</p> <p><u>Private Goods</u> Discrete, packageable commodities characteristic of market.</p>	<p>Cell B</p> <p><u>Joint Goods Subject to Exclusions, Fees, Tolls, etc.</u></p> <ol style="list-style-type: none"> 1. Offshore Hydrocarbons (leases) 2. Fisheries - Nearshore (quotas, limited entry, etc.)
	Low	<p>Cell C</p> <p><u>Common Pool Resources*</u></p> <ol style="list-style-type: none"> 1. Deep Sea Minerals 2. Migratory Fisheries 	<p>Cell D</p> <p><u>Public Goods & Public Bads</u></p> <ol style="list-style-type: none"> 1. Marine Pollution (bad) 2. Marine Science Research (good)

* Common property resources exhibit interdependence but the actual consumption of the good under emerging scarcity conditions leads to subtractability and negative interdependence.

It is important to note at this juncture that, with the notable exception of deep-sea minerals, few marine resources have common pool characteristics, at least in the sense of non-exclusion. This is largely because the process of ocean enclosure has permitted nations to establish control over the resources within their 200-mile exclusive economic zone. Of course, spill-overs exhibited by some ocean resources are not completely captured by such jurisdictions, and exclusion is by no means complete. If the boundaries of existing public authorities are too small or too large, it may be necessary to have recourse to the formation of new collective or public enterprises [2]. In what follows we shall identify several instances in which such spill-overs are incompletely captured by existing public agencies.

In sum, the oceans have lost a great deal of their common pool features owing to the enclosure movement. This movement and its impact has been brilliantly analyzed by Ross Eckert [3]. It is interesting that Eckert argues that it has been UNCLOS III which made the largest contribution to the enclosure movement.

The third proposition is that the prospect of an international conference designed to settle ocean law tends to stimulate an increase in the rate of enclosure which, if the conference eventually generates a treaty, will be recognized as international law. There is more than a little irony in this result: many who believed (and may still believe) that international procedures are the most effective mechanism for halting enclosures may be somewhat galled to learn that this mechanism actually promotes enclosure. Thus, many of those who favored UNCLOS as the last chance to halt creeping jurisdiction find that their efforts contributed to galloping enclosure instead [4].

Despite the disappointment of some with the growth of the enclosure movement, our previous discussion and Eckert's extended treatment suggest that enclosure permits the establishment of property rights, albeit these rights are incomplete when the effects cannot be captured within the enclosed area. Let us turn to a discussion of several other ocean resources.

Polluting the Ocean Environment: A "Public Bad"

A healthy marine environment is a fundamentally important resource. Yet from all indications it is being increasingly endangered as nations treat the oceans as a "sink," into which a wide variety of pollutants are disposed. The sources of this pollution are both land- and sea-based, with the former perhaps the greatest problem to date.

The extent of the damage and its long-run impacts on the marine environment require extensive scientific study. But what is clear for our purposes is that ocean pollution has the

characteristics of a "public bad." Now public goods are goods from which people benefit (e.g., defense, public health, law and order) and from which individuals cannot be excluded: complete jointness and interdependence are the most pronounced characteristics of such goods. If public goods are made available to one person, they are made available to all. Moreover, the consumption of the good by one person in no way reduces the amount of the good available to others. (See Cell C in Figure 1.)

The case of ocean pollution as a public bad is the other side of the public good and is analytically identical except the effects are negative, not positive. In this case we must consider the fact that all seek to avoid public "bads" such as pollution because of the negative utility attached, but unfortunately it has the quality of non-rejectability. Once the ocean is jointly supplied with pollutants from a variety of sources over a very wide area, these become part of the ocean environment and are consumed jointly by those who use the oceans. Pollution is difficult to exclude from the oceans and the users cannot prevent themselves from exposure to its negative effects. Ocean pollution then is basically non-subtractable, what one man consumes does not reduce the negative effects on me if I choose to use it. In sum, the no-choice characteristic which follows from the non-exclusion feature means that the user may be forced to endure the negative effects of the resource.

The characteristics of joint production, joint consumption, and non-exclusion inhibit efforts to reduce pollution. Let us assume that the nations of the world with the greatest interest in a healthy marine environment wish to curtail continued pollution. In order to do so, funds would have to be raised for both research and operations clean-up efforts.

Let us assume that the costs are to be apportioned across a large number of nations and that the contributions are voluntary. Further, let us assume that the contributions are to be related to the intensity of the nation's interest in a clean ocean environment. If this is the case, we can expect each nation to minimize its contribution by misleading the others regarding their true interest in the problem. Alternatively, if contributions are tied to the degree of pollution each creates, then we can expect nations to mislead others with respect to the amount of ocean pollution they actually generate in order to avoid having to pay their full share. If we rely on willing consent among large numbers of contributors to provide funds in order to reduce "public bads" we can expect that the sum of such contributions will be less than the "optimal" amount required in order to remedy the problem. That is to say, some nations will free-ride on the contributions of others.

Mancur Olson has convincingly demonstrated the free-rider phenomenon [5]. He proves that in large groups with joint consumption and non-exclusion, individual choice and voluntary agreement will give rise to collective inaction or institutional failure, and above all, contributions to the collective venture will be sub-optimal.

This potential for free-ridership can be mitigated if the field of effects of "the bad" can be captured or at least partially captured within discernable boundaries. For example, if land-based sources are at issue, individual nations can attack the problem, as many are currently doing, by point-source detection, and thereby reduce the jointness of production problems by introducing an element of exclusion. Nations could then proceed to reduce pollution within their 200-mile EEZ. Where jointness production is strong and it is difficult to precisely identify national responsibility, regional arrangements would seem to have advantages. The UNEP Regional Seas Programme is one approach which would seem to have considerable promise along these lines, because the numbers of participants in the regional programs are relatively small and this tends to reduce decision-making costs. However, one suspects that as long as such arrangements remain purely voluntary, an aspect of free-ridership or contribution minimization will still take place as each country attempts to give the impression that its pollution is less than its regional partner's. This suggests that the rule of willing consent be relaxed and a decision-making body with rule-making capability be established to coerce the nations to pay at "optimal" levels. We shall turn to the analysis of such institutional choices at a latter point.

When the sources of pollution originate at sea, the problem of mitigating their negative effects is much more intractable. The classic case of "public bads" characteristics applies with a vengeance! No exclusion is possible and jointness of consumption is present, as the "bad" spills over into many jurisdictions. Strictly enforced international standards for tankers should help to partially mitigate the problem, but it is still highly intractable due to the characteristics identified above.

Marine Science: A Public Good with Increasingly Limited Domains

Marine science is theoretically a "pure" public good. Scientific research conducted on the oceans should be available to all persons, if it is available to anyone. Moreover, the consumption or use of marine science should in no sense diminish the worth of this resource. This resource is located in Cell C of Figure 1, and has the characteristics of non-exclusion and jointness. Theoretically the fruits of marine science are "owned" by all and cannot be denied to any.

But this "purity" feature of marine science is diminished due to the strategic behavior of nations confronted with uncertainty regarding the existence of valued marine resources within their jurisdiction, the jurisdiction of others, and in the deep ocean. It is to be expected, therefore, that marine science research will be utilized to strategic advantage by nations seeking to maximize their returns from marine resources utilization. Coastal states are expected to establish property rights in marine research, so as to exclude others who might use

information on the state of the resources within their jurisdiction. This strategy provides a degree of exclusion such that marine research functions as a public good with limited domain: that is, it is bound by enclosure and is not available to all. As Eckert observes:

The distributional gains that coastal states capture by restricting even basic scientific research almost certainly impose a cost on the world community by reducing the rate at which we learn more about the basic processes of the planet. Property rights in marine science have also placed some inconvenience on scientists themselves and in many cases the cost of the research projects [6].

What should be a resource available to all is increasingly becoming a commodity.

In the future, such nations increasingly will have to determine whether the value of their research activities is equal to the cash, resources, or other political objectives that they must sacrifice to compensate certain coastal nations for the risk to their wealth that additional scientific and related activities can impose [7].

The movement to "enclose" marine science and restrict its benefits to particular jurisdictions suggest that the "pure" public good characteristics assigned to this resource (i.e. jointness/interdependence and non-exclusion) are not completely applicable. Realistically, users of marine research can be excluded from this resource and the jointness characteristic confined to particular jurisdictions. Hence, we have a public good with limited domain. Marine science should more appropriately be located in Cell B of Figure 1, where exclusion is possible and fees are charged for use.

Marine Fisheries: Common Pool Resources or Joint Goods Subject to Exclusion

"The tragedy of the commons" described previously would appear to be a distinct possibility for marine fisheries, as long as they remain available as common property resources. This is the case for oceanic fisheries, if the lack of control on the resource accompanies the freedom of the seas concept.

As we indicated earlier, the common property nature of the resource creates a situation in which the individual fisherman has no incentive to conserve resources, since his inability to withhold the resource from others in the future means that he will not be able to reap the rewards of his conservationist action. The social costs of this resource exploitation do not become apparent until demand for the product rises to the point where one producer's activity affects the activity of all

producers on the commons. In the fishery commons this can lead to overcapitalization in vessels, a lowering of price, severe depletion of the resource, and conflict among the fishermen. This potential "tragedy" can only be avoided by recourse through some public agency, either currently available or to be established, in terms of which willing consent is relaxed and government action through some form of coercion is exerted.

Clearly, such agencies exist where fisheries are largely coastal and can be managed within existing extended jurisdictions. Within these jurisdictions we expect a variety of management approaches to be employed. Examples of these could include limited entry, quotas on catch, and seasonal openings and closing. Such management mechanisms are in place in most major fishing nations which rely on fisheries off their coasts. If this is the case, we can view such coastal fisheries not as common property resources, as in Cell C of Figure 1, but rather as joint goods subject to exclusion as in Cell B.

Migratory species, however, "spill-over" several national jurisdictions; and because several jurisdictions are involved, management of such species by national enclosure would appear inappropriate. If one uses the enclosure approach, we expect nations having jurisdictions which are crossed by the migrating species to have incentives to charge outside harvesters entry fees or use fees. Such entry charges or fees could have the long-run effect of raising the costs of fishing to the point where it would simply be uneconomical for outsiders to participate. Such a situation appears to be developing among the countries of Central and South America, for example, whose jurisdictions impinge on the migratory course of tuna. These countries are asserting property rights to the tuna and are attempting to exclude others from harvesting them.

Theoretically, of course, migratory species should be managed by some international or regional agency which would take into account the field of effects of the resource involved. Unfortunately, the International Tuna Commission, which for a number of years was an effective mechanism for just such regulation, is rapidly falling victim to the enclosure movement, as nations which can assert property rights to migratory species do so and withdraw from such international bodies. In the case of migratory fisheries, enclosure has a negative impact on the overall benefits, which could be generated through some form of international or regional collective decision-making body. Clearly, then, institutional arrangements must be established in order to manage migratory species. What type of institutional arrangement seems appropriate for managing migratory species will be treated in a subsequent section.

Off-shore Hydrocarbons

We have located off-shore hydrocarbons in Cell B of Figure 1: that is, in the category of "Joint Goods Subject to Exclusion." Such goods are characterized by high levels of interdependence in use, but are capable of exclusion through schemes of fees, tolls, leases, and other forms of charges.

This is a largely satisfactory alternative for utilizing such goods, as coastal nations assert property rights within their exclusive 200-mile EEZ. In this sense, off-shore hydrocarbons can appropriately be treated as collective or joint goods with "limited domain" and leased so that prices can be established.

Off-shore hydrocarbons have characteristics similar to coastal fisheries: both have an interdependence in use but are subject to exclusion under coastal state jurisdiction, which is normally large enough to capture their field of effects. There will be "spill-over" or boundary problems when two jurisdictions are involved, as is the case in the United States-Canada boundary dispute in the Gulf of Maine. Overall, however, spill-overs from off-shore hydrocarbons can be internalized within coastal jurisdictions with minimal spill-over problems.

In sum, we have discussed ocean resources from the perspective of uses, users, field of effects, and jurisdictional boundaries. We found that our classification of resources did not capture certain changes which have taken place as a function of enclosure.

Common pool resources such as migratory fisheries should be placed in Cell B: joint goods subject to exclusion, fees, and tolls. This exclusion is precisely what is happening as nations establish their property rights in migratory fisheries, thereby altering the original common property status of these resources. "Pure" public goods such as marine science research are being subjected to exclusion as coastal nations use scientific research for their individual strategic advantage, thus depriving the world community of important information and also raising the price of such research.

Pollution, which is essentially a "public bad," has some potential for containment by coastal nations, if they internalize the cost of cleaning the marine environment. Yet, as we noted, there is a potential for free-ridership in attempts by nations (or individual polluters within national jurisdictions) to minimize their own contributions to such clean-up efforts.

Pollution outside 200-mile jurisdictions is even more difficult to control, since responsibility for environmental damage is difficult to assign. Of the five resources we considered (six if we split fisheries into migratory and coastal), only two, off-shore hydrocarbons and coastal fisheries, appear to have fields of effects, the boundaries of which might conceivably be captured within existing exclusive economic zones. The remaining four resources all have jurisdictions too small to capture the effects of the goods, or have no jurisdiction at all, as in the case of the deep-sea minerals. If the social benefits of these resources are to be at or near optimal levels, attention must be directed at effectively utilizing existing public agencies or designing new institutions for collective decision-making in order to minimize the negative consequences of spill-overs in relation to inappropriate or non-existent jurisdictions.

INTERACTIONS BETWEEN OCEAN RESOURCE USES

Each resource has been discussed separately without consideration of the implications of resource characteristics on the interactions between multiple resource uses. Figure 2 specifies the relationships between our six resources.

One risks oversimplification in such classificatory schemes, but a number of interesting relationships do seem to emerge. We see an obvious negative relationship between fisheries, whether migratory or coastal, and general pollution and off-shore hydrocarbons, both of which may produce damages to the marine life. We also see a negative relationship between coastal fisheries and migratory fisheries. This negative sign is meant to indicate that, to the degree that migratory species are treated as coastal in the sense of national ownership, a negative overall social welfare situation may be created. Deep-sea mineral exploration could, in principle, damage migratory fish species although the likelihood seems somewhat remote. Marine research is positively related to a number of resources owing to the capacity of basic and applied research to enhance many aspects of marine resource utilization.

Off-shore hydrocarbons have a negative relationship with fisheries and a positive association with pollution, since they potentially contribute to the latter phenomenon. Marine research again is positive as it will help provide information and technology useful to mining off-shore hydrocarbons. There is no discernible relationship between deep-sea mining and off-shore hydrocarbons. Pollution is related negatively to all resources (including marine research which overall probably contributes to reducing pollution).

Overall, these relationships are not surprising. But if one examines those uses which have the greatest potential negative and positive relationships with other uses, we find pollution and marine science near the top -- two resources which are not easily "packaged" within any particular jurisdictions. Moreover, if one considers what sets of negative interactions are likely within existing jurisdictions, the difficulty of the problem is readily apparent. We often have situations of jointness of use among multiple uses of multiple resources across multiple jurisdictions. Off-shore hydrocarbon exploration, coastal fisheries, the use of the ocean as a "sink," all occur simultaneously in limited spatial circumstances and the effects cross over from one jurisdiction to another. These types of interactions take place between the United States and Canada, between the United States and Mexico, between the U.K., Norway, and Germany in the North Sea, and between a large number of countries bordering the Mediterranean. These are particularly difficult situations, because potentially negative "spill-overs" exist between users (i.e. crowding effects), and between uses (i.e. negative spill-overs of pollutants in mining efforts), and jurisdictional disputes arise over appropriate boundaries. The choice tends to be either to "package" the valued resources or to avoid responsibility for the negative impacts.

Figure 2. Interactions Between Ocean Resource Uses

	Fisheries (Coastal)	Fisheries (Migratory)	Offshore Hydrocarbons	Marine Research	Pollution	Deep Sea Bed Mining
Fisheries (Coastal)	-	-	-	+	-	x
Fisheries (Migratory)	-	-	-	+	-	-
Offshore Hydrocarbons	-	-	-	+	+	x
Marine Research	+	+	+	-	-	+
Pollution	-	-	+	-	-	+
Deep Sea Bed Mining	x	-	x	+	+	-

- = Negative
 + = Positive
 x = No Interaction

Solutions to such problems are complex and involve at least the following: 1) drawing appropriate boundaries to include diverse sets of users; 2) assigning appropriate costs among diverse users; 3) facilitating the articulation of demands of users; and 4) formulating and enforcing rules in relation to different patterns of use [8].

FORMING NEW COLLECTIVE DECISION-MAKING ARRANGEMENTS FOR OCEAN RESOURCE MANAGEMENT

If one contemplates the establishment of new public agencies for marine resource management it is necessary to utilize a concept which will permit a systematic assessment of the advantages and disadvantages of alternative institutional arrangements.

As Buchanan and Tullock argue [9], the establishment of new institutional arrangements involves two types of costs: deprivation costs and decision-making costs. Deprivation costs come about due to the fact that in collective decision-making someone must be forced to abide by decisions with which they disagree. These deprivations may be only slight or quite substantial depending on the degree to which the decision deviates from preferences.

Obviously, if only a few people or small groups of people make the binding decisions, deprivation costs can be very high indeed. In fact, deprivation costs will decrease as the proportion of individuals required to agree with a particular decision increase.

This relationship is illustrated in Figure 3.

The vertical axis measures the costs or benefits from collective action. The horizontal axis depicts the proportion of individuals required to agree before action can be taken: the more individuals required, the lower the deprivation costs.

Decision-making costs are also basic to collective action. Individuals suffer opportunity costs in the course of extensive discussions concerning the appropriate course of action. While such deliberations take place, other activities must be foregone.

Figure 4 illustrates decision-making costs [10]. As the number of people required to agree (the horizontal axis) increases, so do the opportunity costs incurred to reach collective decisions.

Obviously, as the Ostroms observe: "the most economic and acceptable method for dealing with common pool resource problems lies somewhere between the extremes of unanimous consent and dictatorship" [11].

One anticipates that the establishment of new collective decision-making agencies for ocean resource management would be characterized by relatively low deprivation costs given the large number of decision-makers involved but, at the same time, they might be expected to have relatively high decision-making costs. Such a situation is illustrated in Figure 5. There the low point of the total cost curve will occur towards the low

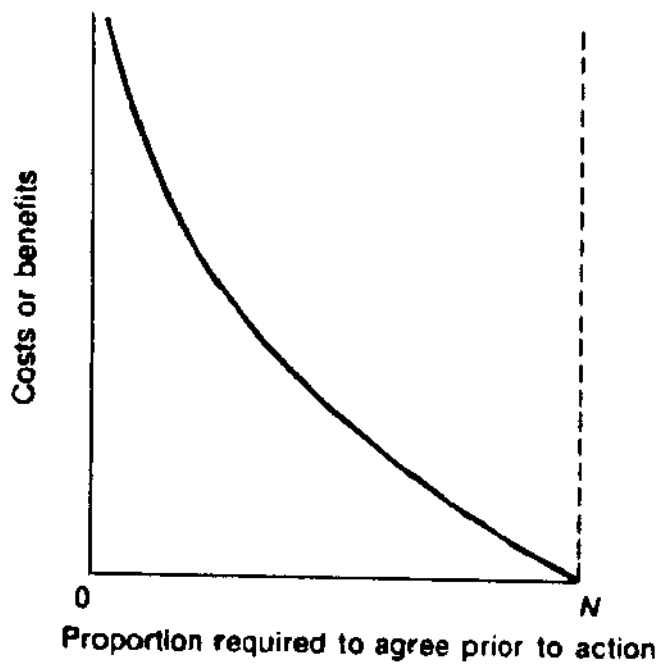


Figure 3. Potential deprivation costs.

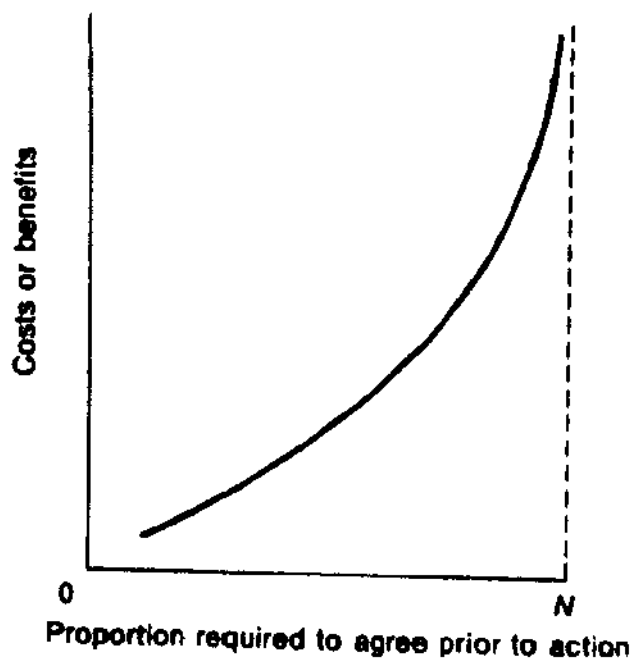


Figure 4. Potential decision-making costs.

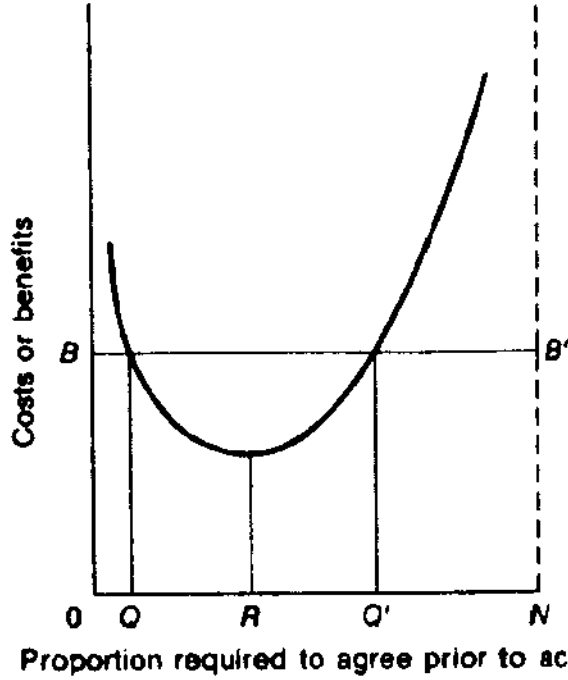


Figure 5. Total costs of collective choice, when decision-making costs are high.

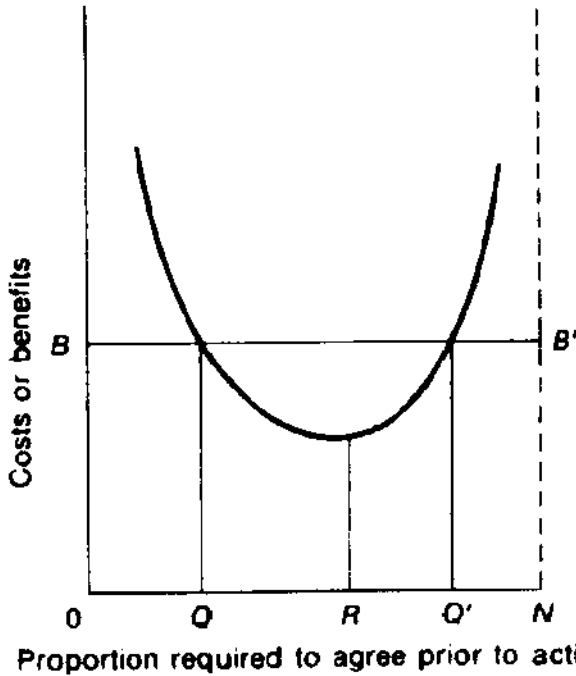


Figure 6. Total costs of collective choice, when decision-making costs and potential deprivation are reasonably balanced.

side of the proportion of persons required to agree in making a decision. BB' in Figure 5 represents the potential net benefit which could be derived from the collective act [12].

If both of these costs are balanced then we have the situation depicted in Figure 6. The optimal decision point in Figure 6 is R but this will move depending on the total cost curve. To each side of R, and to the left of Q and to the right of Q', we create either unacceptable deprivation costs or unacceptable decision-making costs respectively.

If we are thinking of collective decision-making efforts to address ocean resource management issues, we might choose to consider again the characteristics and field of effects of the particular resources in question. If the field of effects of land-based pollution can be identified with a reasonable degree of accuracy, and if these effects are bound by few jurisdictions, we have the potential to establish regional organizations for pollution control. Such organizations may have a membership the size of which generates costs that place the collective in the acceptable range between Q and Q'. Indeed, the success of the Regional Seas Programme may, in part, be attributed to an approach which considers the boundaries of pollution effects and then draws upon the preferences of a relatively small number of nations directly affected. This approach reduces the decision-making costs with such arrangements.

Pollution, which originates at sea from tankers or other sources, is much more difficult to control because the sources are difficult to identify and boundaries of the field of effects are unclear. Moreover, we can expect free-rider behavior, as each nation or licensee attempts to conceal or mislead others with respect to the degree of pollution they create. Large numbers and poor boundary delimitation effects produce uncertainty and high decision costs. This problem may prove intractable for some time despite efforts to design rules and procedures to minimize ocean sources of pollution.

The International Tuna Commission seemed to have promise as an example of collective decision-making in regulating migratory tuna. Unfortunately, such an organization can be viable only if the joint net benefits of collective action exceed the benefits any participant can obtain by "going it alone," so to speak. The enclosure movement has stimulated individual nations to assert property rights over such migratory resources, and the returns from such action may be perceived as greater than the yield from collective action. If this was the perception of member nations, we should have expected a number of them to withdraw from the Commission as they have done. Such calculations can lead to institutional weakness and failure.

Existing jurisdictions are considered too small to capture the effects of many ocean resources. But if we are to create larger jurisdictions for collective decision-making, we should be sensitive to decision-making costs. This requires that the number of participants must be kept within certain limits, lest these costs outweigh joint benefits.

Of course, there can be situations where the jurisdiction is too large for the resource in question: that is to say, there are so many participants that the decision-making process creates opportunity costs which some participants may see as outweighing the joint net benefits which accrue from such collective action. If this is the case, one can expect participants not to enter into such collective arrangements. One suspects that such cost calculations may, in part, underlie the reluctance of the United States to sign agreements regarding deep-sea mining.

The problem of deep-sea mineral extraction is far more complex than this, largely owing to disagreements concerning the extent to which the "common heritage of mankind" concept applies to this resource. The distributional requirements of this concept, as worked out at UNCLOS III, would seem to require participation from a very large number of nations who understandably are less sensitive to decision-making costs, since their potential returns from the proposed arrangements outweigh such costs. One suspects that this may not be the case for the industrialized nations, who anticipate high development costs and high decision-making costs. In short, depending on one's cost calculations, there may be quite a bit, or relatively little, under the benefit line in the previous diagram.

SUMMARY AND CONCLUSIONS

The oceans are a potential source of goods and bads for the people who utilize their potential. A number of ocean resources and uses have been categorized in terms of two factors: interdependence and exclusion. This yielded four cells: private goods, common pool resources, joint goods with limited domain, and public goods/bads. We then explored the characteristics of each resource and located it in a cell of the typology.

We noted that a number of the resources were undergoing change from common pool resources and public goods to joint goods with limited domain. These changes could be attributed to the enclosure movement, which established national jurisdiction over resources previously considered to be common property or "pure" public.

We then examined the negative and positive interactions which existed among selected ocean resources uses. We identified a number of problem areas which seemed to require new institutional arrangements for collective decision-making. The need for collective decision-making arrangements followed from the high degree of interdependence or interaction among the joint and alternative uses that can be made of ocean resources. Such patterns of interaction may, at times, be complementary or they may be conflictful, such that a use for one purpose (e.g., the ocean as a "sink") may damage or preclude the potential supply for another purpose (e.g. fishing).

These relationships among alternative uses can become extremely complex. There are resource uses which exhibit reproduction and joint use in relation to multiple jurisdictions.

In light of these complexities, the development of ocean systems requires the design of institutional arrangements capable of properly apportioning resources to joint and alternative uses. Obviously, there is no institutional arrangement which will completely solve complex multiple use problems. Indeed, there can be no permanent long-run solution because 1) the boundary of those affected by the spill-over costs may change; 2) individuals may obtain better or new information that shows a need for change in arrangements; and 3) new technologies may be developed that create or prevent spill-overs [13].

This potential for change should serve as a warning that the ocean management problems of today will not necessarily be the problems of tomorrow. Powerful theoretical and conceptual approaches to understanding such problems minimize the negative impacts of such changes by providing the tools to reason through the implications of such changes for collective decision-making.

NOTES

1. This statement of different resource characteristics and the consequences of these for social interaction and institutional design is partially derived from arguments developed in Vincent Ostrom and Timothy Hennessey, Institutional Analysis and Design (especially Chapter 5, "Characteristics of Goods and Services as Objects of Human Actions") [in press].
2. Vincent and Elinor Ostrom, "A Theory for Institutional Analysis of Common Pool Problems" in Garrett Hardin and John Baden, Managing the Commons (1977), pp. 157-72, at p. 161.
3. Ross Eckert, The Enclosure of Ocean Resources: Economic and Law of the Sea (1979).
4. Ibid. at p. 47.
5. Mancur Olson, The Logic of Collective Action (1965).
6. Eckert, op.cit., at p. 211.
7. Ibid.
8. Vincent Ostrom and Timothy Hennessey, Institutional Analysis and Design (1977), p. 31.
9. James Buchanan and Gordon Tullock, The Calculus of Consent (1962).
10. Ostrom and Ostrom, op.cit., p. 163
11. Ibid., at p. 164.
12. Ibid., at p. 165.
13. Ibid., at p. 167.

ACCOMMODATION OF MULTIPLE USES OF THE SEAS IN INTERNATIONAL LAW,
WITH SPECIAL REFERENCE TO THE MEDITERRANEAN

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INTRODUCTION

"Multiple uses of the sea" means the use of the same portion of the sea for different purposes, possibly by different persons or states. The development of marine activities well beyond the traditional uses of the seas has made multiple uses frequent and will make them even more frequent in the future.

Besides such traditional uses as navigation and fishing, many other uses, economic and not, are now competing for ocean space: marine scientific research, military activities, exploration for and exploitation of minerals, construction of artificial islands and installations, waste disposal, laying of cables and pipelines, ocean thermal energy conversion, and so on.

The international law problems this competition gives rise to concern accommodation of the various uses. Legal rules on accommodation of uses seem to be required as a response to the problem of multiple uses. Only when such rules fail, will it be necessary to resort to some form of conflict resolution.

Accommodation of uses may be obtained basically in two ways: by affirming that the users are in a position of equality, thus making the rights of each the limit of the others' rights, or by giving preferences and setting priorities between them. Of course, in setting priorities or in putting all users in a position of equality, two main factors are taken into account: the nature of the use and the position of the state whose use of the sea is considered. International law rules on accommodation of uses are either customary or treaty rules, and there are also domestic law rules implementing international law rules which may be relevant. If we look at the overall picture, we have to make a major distinction between the high seas, where the position of the state concerned is not relevant, and the various coastal zones, where the position of the state, as well as the nature of the different uses, is relevant.

In dealing with the Mediterranean, I must stress from the outset that this region is, unfortunately, a sea of conflict rather than a sea of cooperation and accommodation [1]. Moreover, although recent Mediterranean treaties such as the Barcelona Convention and its protocols on dumping and land-based pollution are interesting, they are not particularly original, as they are mainly drawn from previous conventions such as the 1972 London Dumping Convention and the 1974 Paris Convention on Land-Based Pollution.

THE HIGH SEAS

In the high seas, the principle of freedom prevails. Consequently, the general rule of accommodation between the various uses is that "they will be exercised by all states with reasonable regard to the interests of other states in their exercise of the freedom of the high seas." (Article 2, para. 2 of the 1958 Geneva Convention on the High Seas). The new Law of the Sea Convention says almost the same thing, though it uses the expression "with due regard" to replace "reasonable regard" (Article 87, para. 2) [2].

This rule implies that no priority is attributed to one use over another, nor to the uses by one state over the uses by another. Thus the rule of "due regard" seems to be a rule of self-restraint. The limit it sets to each use is that of permitting the same or other uses to other states. It is a rule aiming at avoiding conflict, but it may serve also as a guideline for solving conflicts.

The presence in the new Law of the Sea Convention of a new institution, the International Seabed Authority, may give rise to some new aspects of this problem. Article 147 contains a general rule and a group of special rules on this subject. They consider accommodation of the so-called activities in the Area (i.e. exploration and exploitation activities in the Area), and the other marine activities [3]. The general rule is set forth in paragraphs 1 and 3, and it says: "Activities in the Area shall be carried out with reasonable regard for other activities in the marine environment....Other activities in the marine environment shall be carried out with reasonable regard for activities in the Area." This means that no special priority is set for the new use, deep seabed mining. The new and the other uses are put exactly on the same footing. It seems likely, however, that in practice a situation will develop in which a certain preference will be given, at least in some circumstances, to activities in the Area. This assumption is based on the fact that the user will be an international organization, which will be able to claim that it is acting in the interest of mankind as a whole, which of course is a claim difficult to resist [4]. But the text, as I said before, does not provide for any priority.

Then we have particular rules which are set forth in paragraph 2 of the same article. They concern installations used for activities in the Area, and try to accommodate their presence with navigation and fishing. As regards navigation, it seems to receive a priority insofar as aspects concerning the safety of life at sea are concerned. Thus, due notice of the erection, emplacement, and removal of deep ocean mining installations is to be given to mariners, and the establishment of safety zones around such installations is compulsory. As far as navigation as such is concerned, the priority, seems to be weaker. Sea lanes recognized as "essential to international navigation" must not be obstructed, and the access of shipping to "particular maritime zones" or along "international sea

lanes" must not be impeded by a continuous belt of installations and their safety zones. So the standard is quite exacting. This holds even more true for fishing. Here priority for activities in the Area seems to emerge, because the rule prohibits installations only in "areas of intense fishing activity."

As nothing is said on installations emplaced for uses different from "activities in the Area" and their accommodation with these activities, it would seem that the general rule of "reasonable regard" applies. It appears reasonable, nonetheless, to think that the rules of Article 147, para. 2, on accommodation of installations used for seabed mining with fishing and navigation apply also to these other installations on the high seas.

The "reasonable (or due) regard" rule for accommodation of uses on the high seas has found application in some domestic laws. In the United States' Deep Water Ports Act of 1974 a particular and exclusive use of a portion of the high seas is claimed on the condition that such a use is conducted with reasonable regard to other uses. Licenses under the Act may be issued, if it is determined "that the deepwater port will not unreasonably interfere with international navigation or other reasonable uses of the high seas, as defined by treaty, convention, or customary international law" (sect. 4(c)4). Also all five of the existing statutes on deep seabed mining contain language similar to the one I have just quoted from the Deep Water Port Act of 1974 [5].

COASTAL SEA ZONES

Leaving aside the areas beyond national jurisdiction, I come to coastal sea zones. Here the problems may be arranged into three headings, even though not all of them have the same importance. First is the problem of accommodation between different uses by the coastal state; second, accommodation between uses by the coastal state and uses by other states; third, accommodation between uses of other states.

In internal waters accommodation of uses depends mainly on the coastal state. The problem comes within its own sovereignty, and the solution depends on its coastal management rules and practices. There are some states, for instance France, which have elaborate administrative systems for coastal management in particular areas that have been developed. Plans called "Schemas d'aptitude et d'utilisation de la mer" (sea utilization and aptitude schemes) make detailed arrangements to reconcile various uses in particular coastal areas [6]. There are however, limits to what the coastal state can do in arranging for accommodation of uses within its internal waters. There is the general rule set forth in the Trail Smelter case according to which a state may not use its territory or permit uses thereof, "in such a manner as to cause injury... in or to the territory of another state." This rule applies to the use of internal waters as well as to all other sea zones under national jurisdiction.

Then we have special rules contained in conventions on the protection of the marine environment from land-based pollution and especially, for the Mediterranean, in the 1980 Athens Protocol to the Barcelona Convention. These rules prohibit certain discharges up to the fresh water limit and thus well into internal waters. This kind of rule, general and particular, will bind coastal states in their decisions on multiple uses within their internal waters, and indeed within their coastal waters generally. In particular, limits to polluting activities will have to be set.

Of course, the limits to coastal states' sovereign powers set by the special rules, when applicable, are much more exacting than those provided by the general Trail Smelter rule, because they are independent from the fact that injury is caused to another state. From this viewpoint, the Athens Protocol on Land-Based Pollution breaks new ground in international law.

There is also a very interesting OECD recommendation on coastal management (October 12, 1976) which tries to accommodate not only different uses of the sea but also these uses with activities on land.

In the case of territorial waters most of the observations just made on internal waters also apply. But, in addition, the rules on innocent passage have something to do with accommodation of uses. Article 21 of the new Law of the Sea Convention sets forth the heads under which the coastal state may adopt laws and regulations relating to innocent passage. These heads can be read as a listing of the uses with which passage has to be accommodated: the laying of cables and pipelines, fishing and conservation of the living resources, preservation of the marine environment, and so on and so forth. The activities listed in Article 21 may be conducted not only by the coastal state but also by foreign states, provided that they are authorized by the coastal state. In such a case, the coastal state, when authorizing these activities and in setting conditions for them, will decide on accommodating these foreign activities not only with innocent passage but also with its own activities. I think the most interesting example is dumping.

Dumping is one of the uses of the seas foreign states are entitled to conduct in the territorial sea, and also in the economic zone, only with the coastal state's permission. Together with marine scientific research, it is, to my knowledge, the only one of such activities to be mentioned in the LOS Convention. According to Article 210, the coastal state is not entirely free in deciding upon the possible accommodation of dumping with other uses of its territorial waters. Before authorizing dumping by foreign states, it has to give the matter "due consideration... with other states which by reason of their geographical situation may be adversely affected thereby" (para. 5). Nothing is said about dumping by the coastal state in its own territorial waters that may adversely affect other states. One may assume that the general Trail Smelter rule applies, even though negative implications might be drawn from the rule of Article 210, para. 5.

The 1976 Barcelona Protocol on Dumping does not contain a principle similar to that set in Article 210, para. 5, of the LOS Convention. The reason seems to be that the Protocol considers the Mediterranean as a whole and provides that competence for authorizing dumping in it does not belong to the coastal state, but to the state of loading and to the flag state. Thus, the perspective is totally different. The traditional international law perspective of not causing injury to other states is replaced by the "common sea" viewpoint of preserving the sea considered as a whole.

In international straits and archipelagic waters we can see something analogous to these provisions on innocent passage, even though the list of activities in Article 42 of the UNCLOS III Convention is more limited than that of Article 21. Coastal State laws and regulations on accommodation of foreign States' transit with uses different from those listed in Article 42 of the Law of the Sea Convention do not seem to be admissible. This seems to indicate that passage is to be given priority and that no sacrifice of passage is admissible in order to obtain such accommodation of uses.

The problem of accommodation is more complicated under the regimes of the exclusive economic zone and the continental shelf [7]. Accommodation of coastal state uses in these areas is in general regulated by the coastal state itself. Very few rules of international law are relevant. As far as the continental shelf is concerned, domestic legislation has been adopted in many states in order to accommodate the purposes of exploration for and exploitation of hydrocarbons, as well as the maintenance of installations, not only with the exercise of the freedoms of the high seas by third states, but also with other uses by the coastal state and with authorized uses by other states. For example, under the French decree of 1971, French coastal authorities may prohibit wholly or in part drilling operations on the French continental shelf, if such activities may interfere unjustifiably with fishing activities [8]. There is a similar decree in Italy of 1979 [9].

The Law of the Sea Convention does not intervene in this field, as the matter rests with the sovereign discretion of the coastal state. However, I would mention one exception: namely, Article 246, para. 8, in the field of scientific research, according to which "marine research activities referred to in this article [i.e., research activities undertaken in a foreign state's economic zone or continental shelf] shall not unjustifiably interfere with activities undertaken by coastal states in the exercise of their sovereign rights and jurisdiction provided for in this convention." This article is quite interesting, because it seems to put marine scientific research in a slightly different and more favorable position, as compared to other activities (e.g. fishing) which have to be authorized by the coastal state in order to be conducted by foreign states in the economic zone. It would seem, for example, that even "justifiable" interference could be excluded by coastal states' rules on authorized fishing by foreign

states, while this cannot be done for marine scientific research.

I come now to accommodation between activities over which coastal states enjoy sovereign rights or jurisdiction and activities over which other states enjoy freedom according to the reference to Article 87 contained in Article 58 of the Law of the Sea Convention. The general principle for the economic zone is the so-called "reciprocal due regard" rule. According to Article 56, para. 2, of the Convention, "In exercising its rights and performing its duties under this Convention in the exclusive economic zone, the coastal state shall have due regard to the rights and duties of other states," while under Article 58, para. 3, third states "[i]n exercising their rights and performing their duties [which relate to the freedom of navigation, of overflight, of laying cables and so on] shall have due regard to the rights and duties of the coastal state." The same balance is sought, and the same language is used, that is found in Article 87 for accommodation of the exercise of the freedom of the high seas between different states.

As far as the continental shelf is concerned, there is a different rule. But we have to stress that it seems to apply only to the part of the shelf beyond the 200-mile limit, because the rest of the shelf coincides with the bottom of the economic zone. The rule is in Article 78, para. 2, which states that "the exercise of the rights of the coastal State over the continental shelf must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other States as provided for in this Convention." This rule seems slightly less balanced than the "reciprocal due regard" rule. It seems to me that it gives the principle of freedom a kind of residuary character for reasons which I have explained in another occasion [10].

Some special rules try to elaborate on this general principle. The most interesting ones concern installations. Articles 60 and 80 of the Convention try to accommodate with navigation the use of the shelf and of the economic zone for building artificial islands, installations, and structures. Here too accommodation is sought in such a way as to protect not only navigation but also safety of human life at sea, both on ships and on installations. No mention is made of fishing, unlike the otherwise similar rule concerning the international seabed area [11].

But the point I want to stress at this juncture is that a change was made to Article 60(3) in the last session of the Conference. It was the result of a British proposal on the removal of installations. The old rule was that abandoned or disused installations have to be removed. This corresponds to the 1958 Geneva Convention on the Continental Shelf. The new text says that these installations have to be removed "to insure safety of navigation, taking into account any generally accepted international standard established in this regard by the competent international organization. Such removal shall also have due regard to fishing, the protection of the marine environment, and the rights of uses of other states..." [12]

This new provision seems to me particularly interesting from the point of view of accommodation of uses because it establishes a hierarchy among uses. While removal is compulsory for ensuring safety of navigation, fishing, environmental, and other needs are only to be taken into account.

Another special rule on accommodation of uses elaborates on the "reciprocal due regard" rule. Article 79 of the UNCLOS III Convention, after having underscored that "all States are entitled to lay submarine cables and pipelines on the continental shelf," states in para. 2 that "the coastal State may not impede the laying or maintenance of such cables or pipelines ... subject to its right to take reasonable measures for the exploration of the continental shelf, the exploitation of its natural resources and the prevention, reduction, and control of pollution from pipelines." The "reciprocal due regard" is made more specific by imposing a standard of reasonableness for the measures to be taken in order to exercise sovereign rights and jurisdiction. To this the coastal state's powers of authorizing the delineation of the course of pipelines on its continental shelf must be added.

A further set of special rules of accommodation concerns limitations to the freedom of navigation in the EEZ due to the protection of the coastal state's interest to prevent pollution from vessels. These rules are clearly aimed at safeguarding, as far as possible, navigational interests, while permitting to coastal states serious interference with navigation of foreign vessels in the economic zone only in the most serious cases (substantial discharges, considerable pollution, major damages, etc.), or where navigation occurs in areas of the EEZ which have special characteristics.

We have now to consider problems of accommodation between free activities in the economic zone. These activities are conducted by non-coastal states and also by coastal states. For instance, one such problem concerns accommodation between navigation and the laying of cables. Here there is no specific rule. I think, however, that the general rule of reciprocal due regard, even though it is not applicable strictly speaking, has to be applied, because there is no reason for giving preference to the coastal state in the fields where it is in the same position as other states.

The most interesting rule which may be quoted on this question, even though it applies also to other areas of the sea, is rule 18 of the 1972 Convention on the International Regulations for Preventing Collisions at Sea. This rule sets forth a particularly clear set of preferences for accommodating different uses. All vessels have to keep out of the way of vessels engaged in fishing. However, a ship engaged in fishing, as well as all other ships underway, have, as far as possible, to keep out of the way of a "vessel restricted in her ability to maneuver" [13]. It would seem that there is here a hierarchy between uses. Perhaps this would be reading too much in this rule. It would seem to me that this rule sets preferences between the navigational aspects of the activities mentioned and

that it is inspired by the general preference for safeguarding human life at sea.

ACCOMMODATION OF USES IN THE MEDITERRANEAN: THE 1976 BARCELONA PROTOCOL ON DUMPING AND THE 1980 ATHENS PROTOCOL ON LAND-BASED POLLUTION

The very few rules on accommodation of uses in the Mediterranean are found in the protocols to the Barcelona Convention: the 1976 Dumping Protocol and the 1980 Athens Protocol on Land-Based Pollution.

As already mentioned, the approach adopted by these Protocols is not that of allotting competences on rule-making following the distinction between coastal and other states, but that of protecting the Mediterranean Sea as a whole. Of course, this is due to the specific subjects of the Protocols, to the regional sea approach, and to the particular characteristics of the Mediterranean.

In order to consider these two Protocols from the viewpoint of multiple uses of the seas, one has to acknowledge that, whatever negative value judgment one may have, about pollution, dumping at sea, and land-based discharges, they are considered by the Protocols as legitimate uses of the seas. Thus, in trying to abolish or limit especially the most dangerous of those forms of pollution, the Protocols confirm by implication that other forms of dumping and of discharges of land-based waste are legitimate uses of the seas. Some provisions concerning reduction of pollution by dumping and by land-based discharges may be read as provisions on accommodation of the uses of the Mediterranean for dumping and discharging land-based waste with other uses. It must be noted, however, that these provisions are not unique to the Mediterranean. There are precedents, *inter alia*, in the 1972 London Convention on Dumping and in the 1974 Paris Convention on Pollution from Land-Based Sources.

Both Protocols set forth different categories of prohibitions. Under the Protocol on dumping, the dumping of substances listed in Annex I is prohibited, the dumping of substances listed in Annex II is permitted only under a special authorization, and the dumping of all other matter requires a general authorization to be granted, taking into account factors listed in Annex III. According to the Athens Protocol, parties "undertake to eliminate" pollution from discharges of the substances listed in Annex I, and "shall strictly limit pollution" from discharges of substances listed in Annex II, such discharges being subject to authorizations which shall take account of factors listed in Annex III.

Both Annexes I are drafted in a similar way:

Persistent plastic and other persistent synthetic materials which may materially interfere with fishing or navigation, reduce amenities, or interfere with other legitimate uses of the sea (Dumping Protocol).

Persistent synthetic materials which may float, sink, or remain in suspension and which may interfere with any legitimate use of the sea (Athens Protocol).

Leaving aside the differences between the two provisions, which do not seem to be material, it seems important to underline that all other legitimate uses of the seas are given priority over dumping and over discharging persistent synthetic materials. This provision seems to be directly applicable (self-executing) at least in some domestic systems such as the Italian one. Thus it may also be invoked in private litigation before domestic courts.

In Annex II of both Protocols are listed substances which, though of a non-toxic nature, may become harmful to the marine environment or may interfere with any legitimate use of the sea owing to the quantities in which they are discharged. Here the non-automatic character of the priority given to the other legitimate uses of the sea (authorizations are required) depends on the importance given to the quantitative aspect which has to be evaluated on a case-by-case basis.

Annex II of the Dumping Protocol also lists among things which cannot be dumped without a specific authorization, "containers, scrap metal, and other bulky wastes liable to sink to the sea bottom which may present a serious obstacle to fishing or navigation." No similar provision is included in the Athens Protocol because it would not come within the definition of land-based discharges in the Protocol. The provision gives a clear priority to fishing and navigation over dumping of these particular substances. One may wonder, however, whether this kind of dumping can be considered as always permitted, if it causes serious obstacles not to fishing or navigation, but, for instance, to the laying or to the maintenance of cables and pipelines. I would think that, at least beyond the territorial sea, the general rule of due regard applies.

CONCLUSIONS

The survey of international law rules on accommodation of uses just conducted leads to the following observations.

First, problems of accommodation of uses are central in today's international law, because uses and users of the sea are becoming every day more numerous.

Second, most of the existing, especially general, rules of international law are competence-allocating rules, and do not set explicitly, criteria for accommodating uses of the sea.

Third, even the most important rules that attempt accommodation (e.g., those based on the "due regard" concept) do not go beyond setting a vague guideline for the balancing of interests.

Fourth, only rules on particular questions, considering specific problems of accommodation between a given set of uses (e.g., those on installations) or considering the same use when conducted for different purposes (e.g., rule 18 of the 1972

Regulations on Collisions), as well as some rules on pollution in the Mediterranean, go a step further by indicating substantive principles of preference.

Fifth and last, most, though not all, the priorities set forth in the special rules just mentioned can be explained not as preferences for one use over another as such, but as deriving from the principle of safeguarding life at sea. This principle seems to me to be perhaps the only principle of preference one can safely identify in the international law of the sea. Rule 18 of the 1972 Regulations on Collision at Sea and the rules on Installations in the Law of the Sea Convention are clear examples. Some uses are preferred over others not as such, but because another set of priorities would increase the risks for life at sea.

In the light of these observations, one might ask whether the international community ought to develop further rules for the accommodation of uses in order to permit multiple uses of the seas to be conducted in a safer and clearer legal framework. Of course this certainly is a worthwhile objective and it seems possible to develop further particular rules concerning accommodation of specific uses.

It does not seem possible, however, to solve each and every problem of accommodation by setting hard and fast rules formulating clear cut priorities. In most cases the objective to be pursued is to permit as many different activities as possible without one prejudicing the others. Moreover, when preferring one activity to another is inevitable, accommodation of uses depends on a case-by-case assessment of the relevant circumstances. Quantitative and qualitative aspects of each case are to be considered as well as various policy and interest aspects. All this cannot be done without the same kind of managerial authority intervening in the process.

Thus the road towards formulating substantive international law rules on accommodation of uses can be pursued only up to a certain point. Beyond that point, the road towards managing the competing uses of the seas has to be taken. This means developing international cooperation and organization, and the surrendering by states of some of their sovereign and jurisdictional powers.

The conclusion of the Third U.N. Conference on the Law of the Sea, by eliminating uncertainty regarding the extent of coastal state jurisdiction, may facilitate the taking of this new direction. However, one may also think that it will be difficult for states to surrender some of their newly recognized powers. Moreover, the lack of unanimity in supporting the new deep seabed regime set forth in the Law of the Sea Convention, which can be seen as a managerial regime with many elements of accommodation of uses, may be another forewarning of the difficulties that lie ahead.

NOTES

1. Two recent important studies on the subject are: B. Boxer, "Mediterranean Pollution: Problem and Response," 10 Ocean Dev't & Int'l Law J., 315-56 (1982), and T. Scovazzi, "Implications of the New Law of the Sea for the Mediterranean," 5 Marine Policy, 302-12 (1981).
2. On this change of terminology, see B.H. Oxman, "An Analysis of the Exclusive Economic Zone as Formulated in the Informal Composite Negotiating Text," in T. Clingan (ed.) Law of the Sea: State Practice in Zones of Special Jurisdiction (Proceedings of the Law of the Sea Institute 13th Annual Conference, Honolulu, 1982), pp. 57-78 at 70 and T. Treves, "Drafting the LOS Convention," 5 Marine Policy, 273-76 at 274 (1981).
3. On this point, J.P. Queneudec, "La compatibilite entre l'exploitation des fonds marins et les autres activites maritimes," in T. Treves (ed.), Lo Sfruttamento Dei Fondi Marini Internazionali (1982), 65-77.
4. Queneudec, supra note 3, pp. 71-74, T. Treves, "Military Installations, Structures, and Devices on the Seabed," 74 Am.J.Int'l Law, 808-57, at 853-55.
5. Under sect. 112 of the U.S. Deep Seabed Hard Mineral Resources Act of 1980 licenses "shall include such restrictions as may be necessary and appropriate to ensure that exploration or commercial recovery activities conducted by the licensee or permittee do not unreasonably interfere with the interests of other states in their exercise of the freedoms of the high seas, as recognized under general principles of international law." According to sect. 7 of the United Kingdom's Deep Seabed Mining (Temporary Provisions) Act 1981 "It shall be the duty of the licensee to exercise his rights under the licence with reasonable regard to the interests of other persons in their exercise of the freedom of the high seas." The French law of December 23, 1981 provides that the licensee must "not unduly hamper the exercise of the freedoms of the high seas," while art. 9 of the Soviet edict of April 17, 1982 provides that deep seabed mining conducted under the edict "must not create unreasonable obstacles to the exercise of the principle of freedom of the high seas and to lawful activities in the world oceans." The law of the Federal Republic of Germany of August 16, 1981 refers to the duty "to take into account the interest of third parties in the use of the deep seabed and the sea."
6. "Le schema d'aptitude ef d'utilisation de ia rade de Brest" in Le Moniteur (Brest), May 18, 1981.
7. See especially B.H. Oxman, supra note 2, pp. 70-77, and J.P. Queneudec, "Espace marin: des usagers antagonistes," La Nouvelle Revue Maritime, April 1981, pp. 58-71.
8. Decret n. 71-360 of May 6, 1971, "Journal Officiel de la Republique Francaise," May 15, 1971.

9. Decree of the President of the Republic, May 24, 1979, n. 886, "Gazzetta Ufficiale della Repubblica Italiana," April 26, 1980. n.1 (supplement) especially articles 28 and 29.
10. T. Treves, 75 Am. J. Int'l Law, 933-34 (1981).
11. The reason seems to be that as fishing in the exclusive economic zone is either conducted or authorized by the coastal state, its accommodation with artificial islands and installations is left to the domestic law of that state. Thus, for instance, the above quoted Italian decree of 1979 provides that, in authorizing drilling in the continental shelf, Italian authorities must take into account consequences for the "exercise of fishing" and the conservation of the living resources of the sea, and that, in establishing safety zones around fixed and movable platforms, they shall determine limitations and, if necessary, prohibitions as regards not only navigation and anchoring but also fishing.
12. Interesting comments on this provision are found in the "Report of the Committee on the Exclusive Economic Zone," presented at the Montreal Conference of the International Law Association (1982).
13. Rule 3(g) of the 1972 International Regulations for Preventing Collisions at Sea lists six categories of activities which render the vessels engaged in them "restricted in their ability to maneuver."

THE NORTH SEA: BASES FOR MANAGEMENT AND PLANNING IN A MULTI-STATE SEA REGION

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INTRODUCTION

The North Sea is historically the primary maritime segment of the European economy. In the past two decades greatly increased exploitation of biological and mineral resources has brought the North Sea into even sharper political focus. Today it is the world's most intensively used shelf sea. The intensity of the uses and complexity of their interactions have resulted in many environmental management problems, and led to the growth of a system of maritime management of increasing sophistication but geared largely to single uses. It has been suggested that more comprehensive planning would be a more suitable approach to ocean management in this region [1].

The primary purpose of this paper is a preliminary evaluation of the bases for a multiple use management approach in the context of existing management development. The paper adopts a synoptic approach to the evolution of North Sea administration and related management issues, followed by a general review of progress in North Sea management. Considerations in the establishment of a multiple use approach are outlined. The detailed aspects of the themes discussed are considered in the report presently being completed by the North Sea Research Unit in the Centre for Marine Law and Policy at UWIST. The work is sponsored by the Science and Engineering Research Council.

THE EVOLUTION OF MARITIME MANAGEMENT ISSUES AND ADMINISTRATION

The Historical Context

The development of the North Sea may be usefully considered in terms of phases, uses, and regional patterns [2]. The key to the spatial and temporal combinations of uses lies in the phases. The history of the North Sea is relevant in this respect and may be considered as consisting of four stages. The first dates from its origins at the end of the last glaciation down to Roman times, when arguably the first significant human impact occurred around the shorelines in the low-lying coastal areas of the extreme south. Much environmental research activity relates to this time scale.

The second and subsequent phases may be considered within a man-environment interaction paradigm, composed primarily of the economic, social, and political features of the bordering lands. The second phase, from Roman times until the commencement of the Industrial Revolution in Britain and the adjacent Low Countries in the eighteenth century, was characterized by increasingly

Intensive uses of the sea for trading, naval warfare, associated commercial port development, and fisheries. Important developments include the maritime ascendancy of the Vikings in the Early Middle Ages, the rise and decline of the Hanseatic League, the rise and demise of the Dutch North Sea herring fisheries, and the commercial revolution of the seventeenth century, which was associated with the rise of international sea trade, and was an important aspect of the rise of the colonial trades which culminated in the establishment of the world trade system in the nineteenth century. It is a phase of special significance in contributing towards the identity of the maritime nations and associated sub-national maritime cultures in the North Sea region, and is central to research provision for maritime historical and archaeological research, and related aesthetic appreciation of maritime culture.

The third phase is the period spanning the industrialization of Europe and the collapse of the world economic order between the World Wars. During this period the North Sea became simultaneously the main focus of the rapidly expanding European economy based upon industrial Britain and adjacent parts of the continent, and the focus of the first true world economy. Within the surrounding countries a trend toward regional economic specialization [3] began to emerge accompanied by enormous trade expansion leading to intense shipping and port development. The same period also witnessed a rapid development of coastal industries and fisheries. Probably for the first time outside the coastal reclamation areas of eastern England and the Low Countries, a widespread and measurable impact by man was exerted, especially through overfishing and river pollution. This was accentuated by progressive change from sail to steam in fisheries and sea trade, and from water power to steam power in industry. There was a great expansion of coastal settlement associated with waste input.

By the end of the nineteenth century the problems were being recognized, notably through the establishment of national fisheries laboratories and the International Council for the Exploration of the Sea [4], principally concerned with the scientific bases of fisheries management and the apparently related field of pollution. Also, the weight of legislation regained for administrative purposes in ocean affairs became significant. U.K. legislation was probably specially important because of that country's position as the world's leading maritime nation and as the centre of the British empire. It included, for example, several fisheries acts, merchant shipping acts (including the Merchant Shipping Act of 1894), and the Pilotage Act of 1913. There was much private legislation relating to harbor development. The first measures of significant regional co-operation also date from this period, including the convention for the Regulation of the North Sea Fisheries of 1882, in which a definition of the North Sea was proved necessary, perhaps for the first time.

The current phase began with the Second World War. Naval and air action had a tremendous impact through the sinking of

merchant ships and mining of wide areas of the southern North Sea. After the War, the field of shipping and port development was characterized by specialization and some rationalization, leading to the decline of many ports, the expansion of others, and acceptance of the need for marine traffic control in the most congested sea areas. Sustained pressure on fishing resources was the emergence of an international management framework [5]. Sand and gravel extraction and offshore hydrocarbon extraction emerged as major maritime industries in the 1960's [6]. The development of international management institutions with regional or global responsibilities gathered pace in the 1970's, notably in the fields of waste disposal, pollution control, oceanographic research, and fisheries [7]. The European Economic Community emerged as a potentially significant factor in maritime affairs [8]. Also significant was the key role in regional economic development played by maritime industries, evidenced by governmental and other research on the regional impact of the offshore oil industry in Scotland and Norway [9]. Less spectacular, but just as significant, have been studies related to fishery plan developments [10]. Ecological concern has been focused upon the fate of seabirds, seals, and coastal wetlands, notably the Wadden Seas of the extreme south [11].

The resultant pattern of uses has functional and regional characteristics. Spatial management which is functionally based institutionally is gaining ground. Administrative integration of functions is just beginning to respond in a number of ways at the national level. The most important themes are the increased intensity of use and the actual or potential conflict among uses. A related theme is the environmental impact of uses upon the sea and coast. Finally, there is the continuing development of political responses to the issues involved, especially nationally and at a European level, the EEC being a key institution.

The Evolution of Legal and Administrative Frameworks In Sea Use Management

It is notable that the modern history of the international law of the sea largely originated in the conflict between England and Holland, the world's two greatest maritime powers of the seventeenth century. One of the issues at stake, the herring fisheries, was specifically a North Sea issue. The present legal background to North Sea planning has been reviewed by Brown [12], and is the outcome of progressive developments since these early beginnings. Two points should be noted. The first is that of the hierarchical nature of the legal framework in the region, ranging from the local, through the national and supra-national (EEC), to the international. Secondly, the legal system as it stands is mainly the product of responses to specific problems as they arose, rather than some grand design imposed on the oceans after the fashion of UNCLOS III. The main thrust has come from the practices of state entities and the evolution of customary international law. The most significant

cases have been in the fields of fisheries legislation, delimitation of the continental shelf, and pollution. It is no accident that the maritime role of the EEC is advancing most strongly in these fields, where regional management seems crucial to the development of common interest.

Whereas the development of the legal framework may be seen as a response to conflict situations, the growth of administrative functions is in a real sense a response to a variety of practical problems, most of which were not primarily legal in nature. The roots of the administrative system which has been developed for the North Sea lie in the industrial phase and may be seen as the outcome of steadily increasing pressures of use. The earliest regulatory initiatives, in the fields of fisheries, shipping, and navigational safety, all date from the nineteenth century, and were dominated by national measures.

The National Level of Maritime Administration

Since the Second World War, both the scope and scale of national maritime administration have been greatly extended. The administration of these activities has been expanded, and other activities like mineral exploitation, waste disposal, and pollution prevention have come under regulatory controls. These controls have been applied not only to coastal zone areas but also to offshore areas by virtue of the progressive extension of national jurisdiction beyond the original territorial sea limits. The nation state has throughout been at the centre of administrative growth, and it can be argued that the main administrative purposes throughout were those which served the needs of the state directly, such as security, raising of revenue through taxation, and the regulation of the economy through its component sectors; or indirectly through social well-being concerns such as that reflected in marine safety legislation.

In general, the administrative trend in the region has been toward the establishment of specialist maritime sections within major government departments with at least superficially cognate land interests. This pattern has been particularly evident in the United Kingdom, the Federal Republic of Germany, and France. For example, in the U.K. agriculture and fisheries are grouped together, while shipping is allied to transport and trade. In the Federal Republic of Germany a similar approach has been adopted, while in France fisheries has been linked with transport until recently. The devolution of responsibility to the Scottish Office and the German Lander is another feature of the new administrative system for the North Sea.

As it happens, in all the smaller North Sea countries, including Scotland, maritime interests are relatively important, and this has tended to be reflected in administrative organization in the elevation of maritime affairs to separate ministerial status, as in the case of fisheries in Scandinavia. In such states, the move towards coordination of all maritime affairs has come first, notably in Norway and the Netherlands. But the most fundamental reorganization of maritime

administration is that of France, the first of the large states to introduce a comprehensive marine ministry in the form of the *Ministere de la Mer* in 1981.

Other Levels of Maritime Administration

At the supra-national level, maritime affairs in the EEC (established in 1957) remained relatively unimportant until the early 1970's, when the U.K., Ireland, and Denmark acceded to the Treaty of Rome. The scope of the Community's maritime jurisdiction remains limited compared to that exercised by national governments. The main focus of attention has been on those matters in which regional cooperation is crucial, namely, matters concerning the water column. Much heat has been generated in attempts to arrive at a Common Fisheries Policy. Pollution control has also been a major concern. Little progress has been made in the EEC in the fields of shipping and ports, or mineral exploitation which is closely linked to energy policy.

The role of local government is of greatest significance in coastal management and planning, and in dealing with waste disposal, pollution control, and recreation. It also has a role in emergency planning procedures, particularly those likely to be associated with environmental impact or quality. Quasi-governmental agencies sometimes have an important role in marine affairs: for example, in the field of fishing. Although it is perhaps not conventional to think so, a large range of non-governmental organizations are also involved in management. By far the largest group are of course the users, who belong mainly to the marine industries, especially fisheries, mineral extraction, merchant shipping, together with recreational interests -- principally, organized interest groups and the public at large. These groups are increasingly articulate in matters of management policy. By far the most significant are the mineral industries with their massive corporate structures, and the fisheries with their cooperatives and regional producers organizations. A role is also played by certain special interest groups, such as environmentalists' organizations and information organizations, which, although part of wider governmental or industrial structures, may be considered as having an independent existence from a management decision-making point of view. A prominent example is the International Council for the Exploration of the Sea (ICES).

A GENERAL REVIEW OF PROGRESS IN NORTH SEA USE MANAGEMENT

The temporal and spatial pattern of legal and administrative development has produced some distinctive arrangements for the management of several major uses of the North Sea. It is instructive to consider first of all the spatial organization of the sea, followed by the material uses -- extractive in the case of minerals and fisheries, and additive in the case of waste disposal. Finally, it will be necessary to consider those uses with primarily non-material or environmental

aims which focus upon the use of the marine environment as a whole, including defense, research, recreation, and conservation.

Sea Transport

The southern North Sea is the busiest area in the world for ship movements. Through it transits an enormous diversity of vessel types and cargoes. There may be between 170,000 and 230,000 ships per year passing through the area, and about 340 ships transit the Strait of Dover each day. The North Sea is also one of the world's major black spots for collisions and groundings due to high traffic density, bad weather, and multiship encounters [13]. Pollution from shipping is extensive and made more acute by the rights of tankers and chemical carriers to clean their tanks and discharge washings into the sea, although the strong tidal regime, water circulation, waves, and high oxygen content of the North Sea appear to mitigate the worst effects of this discharge.

All the states bordering the North Sea are signatories to the Conventions relating to navigation and safety at sea. There are also joint traffic control arrangements between Britain and France in the Strait of Dover [14]. Wider regional maritime safety measures for the control of shipping, pilotage, transmission of information on ships, crews, and cargoes between ports, and coordinated action against offending ships are still at early stages of discussion. In spite of the British desire to confine regulations to internationally agreed conventions, as distinct from regional and national unilateral measures, the Port of Sullom Voe in Shetland has refused access to ships regarded as unsafe or guilty of deliberate pollution of the sea [15].

There is, in fact, no significant shipping or ports policy within EEC other than the international conventions [16]. There are regional agreements on dealing with incidents of pollution and in search and rescue.

The pattern of shipping across the North Sea is undergoing a number of changes. Until recently the tendency was for "long-land, short-sea" routes, but with increases in the cost of road transport the pattern is towards "short-land, long-sea" movements. This has several implications, but primarily it illustrates the need for regular gathering and analysis of statistics for policy purposes.

Mineral Exploitation

Undoubtedly the greatest impact in the last two decades has been the result of mineral exploitation, which currently lies at the center of many conflicts in sea use as well as providing the impetus for delimitation of the continental shelf. Both the major industries, sand and gravel extraction on a large scale, and offshore oil and gas, are relatively recent. The key point about this type of activity is that it is static in locations determined by the occurrence of the seabed and subsea resources. Thus the interactions are in a sense foreseeable and almost

FIG 1 MARINE TRAFFIC

- IMO traffic separation lanes
- Deep water routes based on NSHC recommendations since 1966
- - - Additional projected routes proposed by the oil tanker cos, 1976

- Major cargo ports inc. oil terminals
- Offshore installations groups ●-oil ○-gas
- ICES Area IV abc boundaries

SOURCES: HYDROGRAPHER OF UK NAVY (REF 2)
LEE & RAMSTER (REF 37) WITH ADDITIONS

PROJECTION: MERCATOR

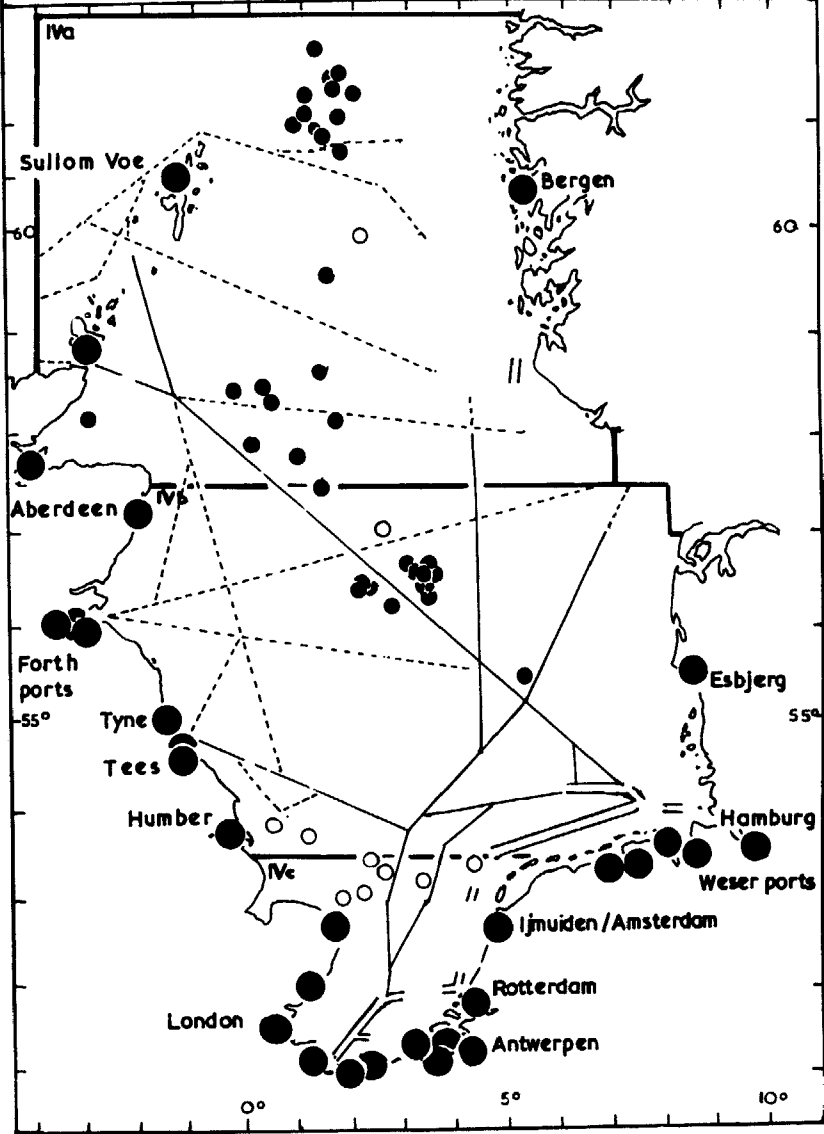
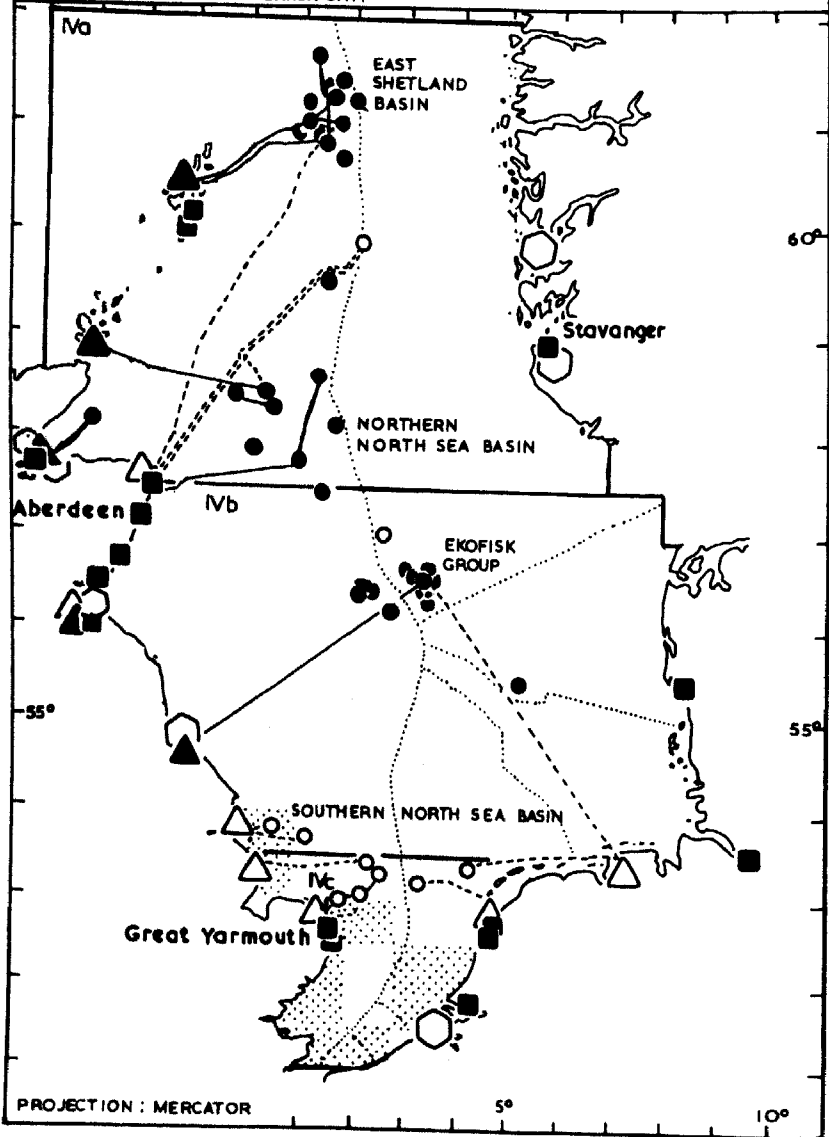


FIG 2 MINERAL EXPLOITATION

- | | | | | |
|-------|---------------|---|---|--|
| ● | Oilfields | } in production or
under development | ■ | Service bases/ports |
| ○ | Gasfields | | ⬡ | Offshore engineering
yards |
| — | Pipelines—oil | } existing or under
construction | ⋯ | Median lines |
| - - - | " -gas | | ▨ | Sand and gravel dredging
concession areas (major) |
| ▲ | Terminals oil | | — | ICES Area IVabc |
| △ | gas | | | |

SOURCE NORTH SEA RESEARCH UNIT



PROJECTION : MERCATOR

Immutable, once the pressure has built up sufficiently for the basic investment decisions to be taken.

The tendency is for other activities to have to adjust to the newcomer, a trend reinforced by the corporate structure of the industries involved and the general high priority given by states to these developments. Thus for example, there has been a series of ad hoc arrangements made with other sea users and in approaches to dealing with coastal impacts of offshore activities, notably in the U.K. In the case of the fisheries, the main conflicts have included loss of access to grounds, interference of offshore operations with fishing resulting in damage to fishing gear [17]. There is also concern about pollution risks. These matters are dealt with mainly through direct liaison between the users involved, although there appear to be wide differences in provisions made by the U.K. on the one hand, and Norway on the other [18]. In Scotland, in particular, no clear coastal planning strategy with respect to industrial development has appeared, and thus, for example, planning guidelines were published by the Scottish Office [19] only at the height of the speculative phase in the development of onshore installations.

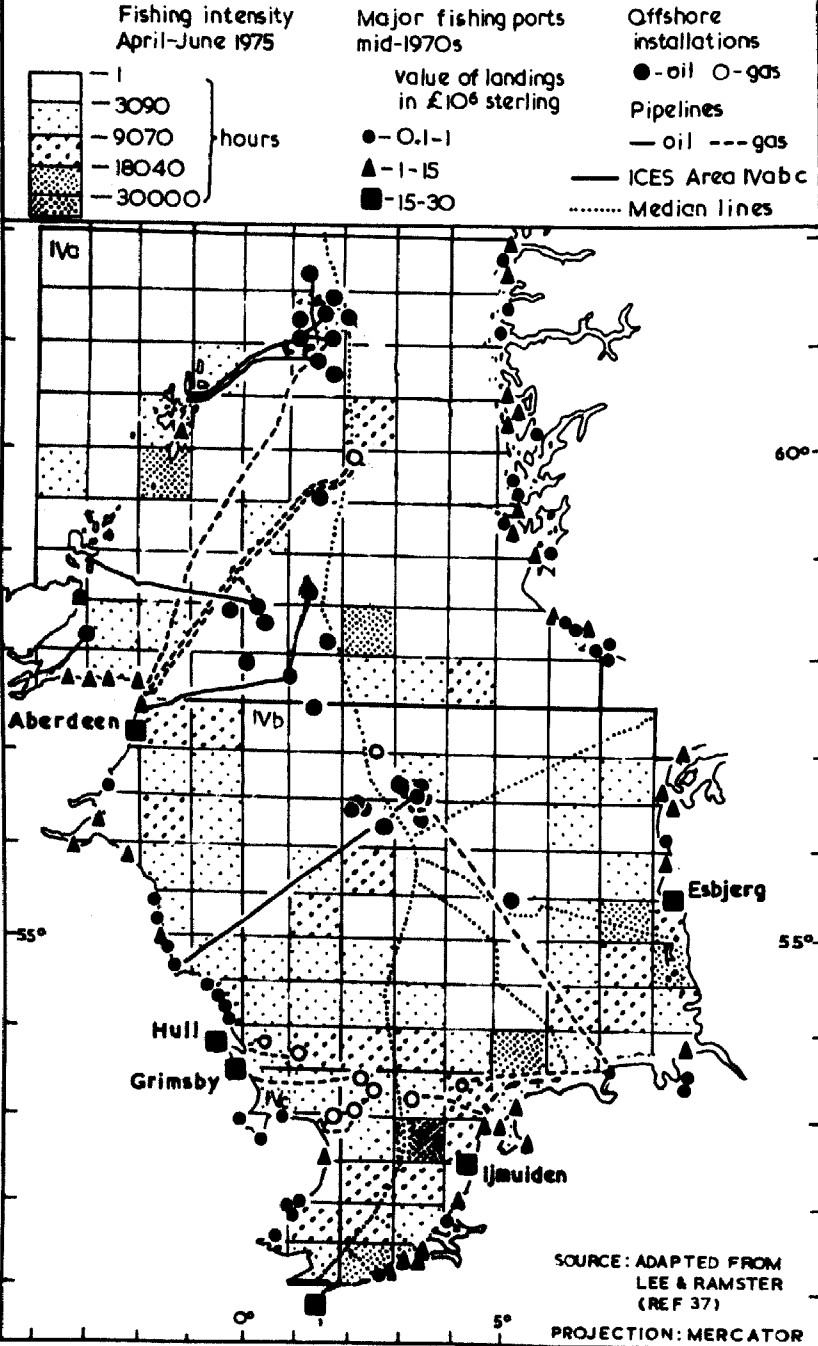
In the offshore oil industry the rate of development and consequent impact depends upon national policy objectives [20] with regard to depletion and utilization of hydrocarbon resources. In the North Sea there is a contrast, on the one hand, between the U.K. and the Netherlands, which have aimed for rapid development, and Norway, on the other, where the pace of exploitation has been deliberately restrained and where impact, notably on fisheries, has been more systematically dealt with. It is worthy of note that in a spatial management context there has been a substantial identity of interest between the corporate state and the corporate private sector, generally in the direction of rapid development. This is evident, for example, in the attempt to modify land planning legislation to favor unhindered development through the promotion of the Petroleum Development (Scotland) Act of 1975 [21].

The main reactions to this seeming identity of interests has come at the local level. In Scotland this has been very evident in the spirited contesting of planning proposals at numerous public inquiries, and through the legislative moves of Shetland and Orkney County Councils [22], which have attempted to gain stronger control over land and sea use than that provided in the planning legislation, together with participation in certain service activities, including the operation of the Sullom Voe Terminal, and financial compensation for the disruption caused by the oil industry. The success of local interests in this and in representations at planning inquiries is debatable; but political will for administrative reorganization has been clearly visible.

Fisheries

In contrast to the mineral resource industry, fishing is a traditional industry. The mode of social organization is mostly

FIG 3 FISHERIES



small-scale private enterprise, and the role of national government in management has been paramount from the beginning. From the national approach has developed the extensive infrastructures of fishery research, the increasingly sophisticated systems of surveillance and enforcement, safety regulation, and financial support for the respective national industries. Conflict has erupted usually with the industry, mostly over international, national, and local allocations of resources. This has a long history dating from the conflicts over the herring fisheries in the seventeenth century down to the so far unsuccessful attempts by the EEC to frame a Common Fisheries Policy [23].









The problem of fishery conservation [24] appears at first sight to have proved just as elusive of solution, although it is a century since the Convention for the Policing of North Sea Fisheries. The history of the Overfishing Convention, leading ultimately to the North East Atlantic Fisheries Commission and the parallel decline of important North Sea fisheries, is well known. The eclipse of NEAFC by the advent of coastal state jurisdiction to 200-miles, together with the advent of the EEC, has produced an uneasy situation in which effective management remains problematical in an area which ranks as a leading world fishing region.

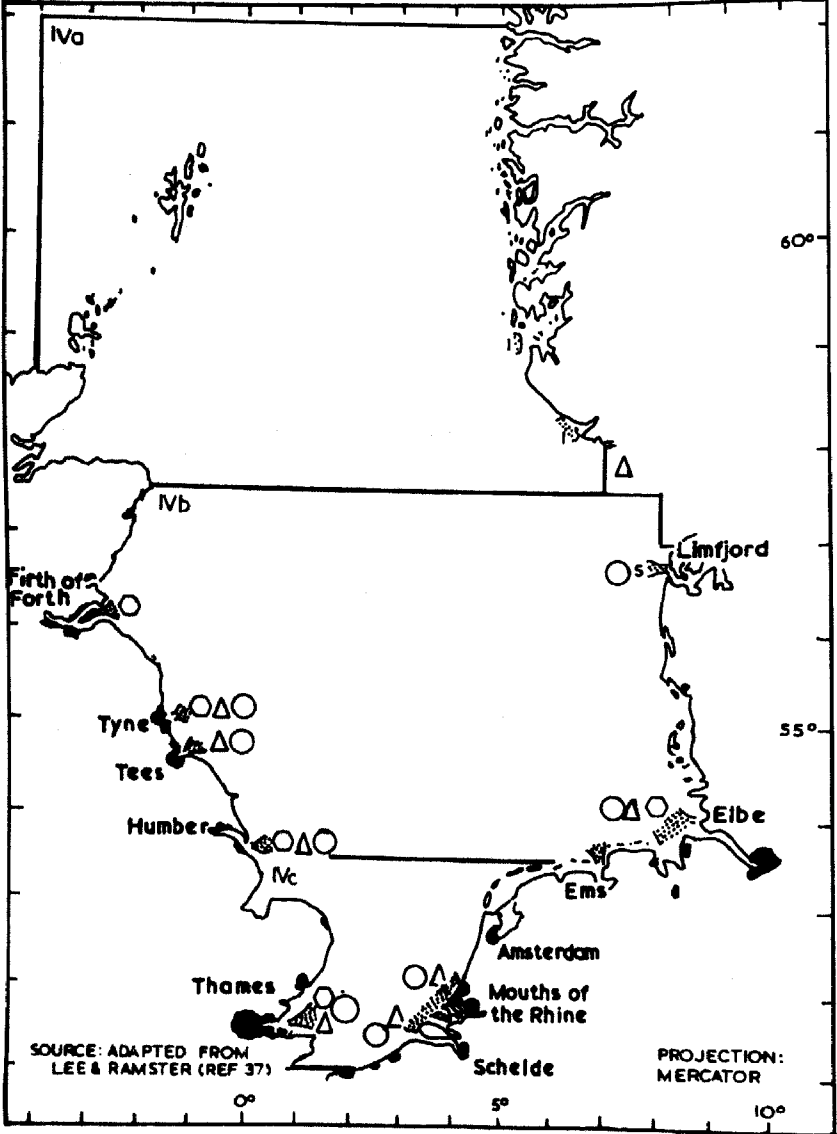
Inevitably under such circumstances there is strong pressure for unilateral national supervision of fisheries within the EEZ as evidenced, for example, by Norway's careful fisheries policy and by the United Kingdom's operation of the "Norway pout box" (an area in which fishing for Norway pout comes under special restrictive measures). Since there is no overall protective system such as that of the U.S. Fishery Conservation and Management Act, the threatened local communities are sometimes forced to take action on their own. Fishing community concerns were a major factor in keeping Norway out of the EEC; Faroe remained outside the EEC to safeguard its fishing interests; and Greenland has just voted to withdraw for similar reasons. In the northern isles of Scotland, especially Shetland, the approach has been to produce a regional fishing plan as a basis for negotiation with U.K. and EEC interests [25]. Yet the Northwest European area, and notably the North Sea and Baltic, has played a leadership role in the development of fisheries research around the world, the ICES remaining the oldest and most influential scientific organization of its kind in the field [26].

Waste Disposal and Pollution Control

In contrast to the long history of fisheries management, the control of marine pollution and waste disposal in the North Sea area is of recent (post World War II) origin, although regional research and monitoring of pollution associated with fishery research has a much longer history. The North Sea is, of course, subject to the global measures taken to combat pollution, especially those related to pollution from ships. However, like fisheries, marine pollution control is subject to

FIG 4 WASTE DISPOSAL AND POLLUTION

- | | | | |
|---|-----------------------------|---|------------------|
| Major land based sources ⁺ | | Dumping at sea ⁺ | |
|  | sewage and industrial waste |  | sewage sludge |
|  | mainly sewage |  | industrial waste |
|  | mainly industrial waste |  | dredge spoil |
| ⁺ major disposal areas are generalised | | | |
|  | major urban areas |  ICES Area IVabc | |



SOURCE: ADAPTED FROM LEE & RAMSTER (REF 37)

PROJECTION: MERCATOR

regional management through the Oslo and Paris Commissions and related measures [27]. The EEC is also developing a role in this field, for example, with regard to river pollution and the quality of coastal waters. Nationally, river authorities have responsibilities for the monitoring and control of pollution exercised within national legislative frameworks.

As with fisheries, therefore, there is a basis of national legislation relating to pollution from land-based and marine sources, upon which international cooperation is being built. However, the intense local dangers of pollution accidents, notably from ships, is again tending to produce local adjustments to general pollution control measures. Contingency plans must be locally based, even when operating in a national or international framework. For example, the emergency areas at sea operated by the oil companies for groups of fields [28] are designed to cope with serious incidents such as blowouts. Local authorities in the U.K., for example, are responsible for maintenance of the means for dealing with coastal pollution. Significantly this principle has been extended in the port of Sullom Voe, in which the local authority has a controlling interest, where a strict inspection of tankers is backed up by an aerial surveillance operation and the operation of a marine traffic scheme for tankers navigating in Shetland waters [29].

The Marine Environment

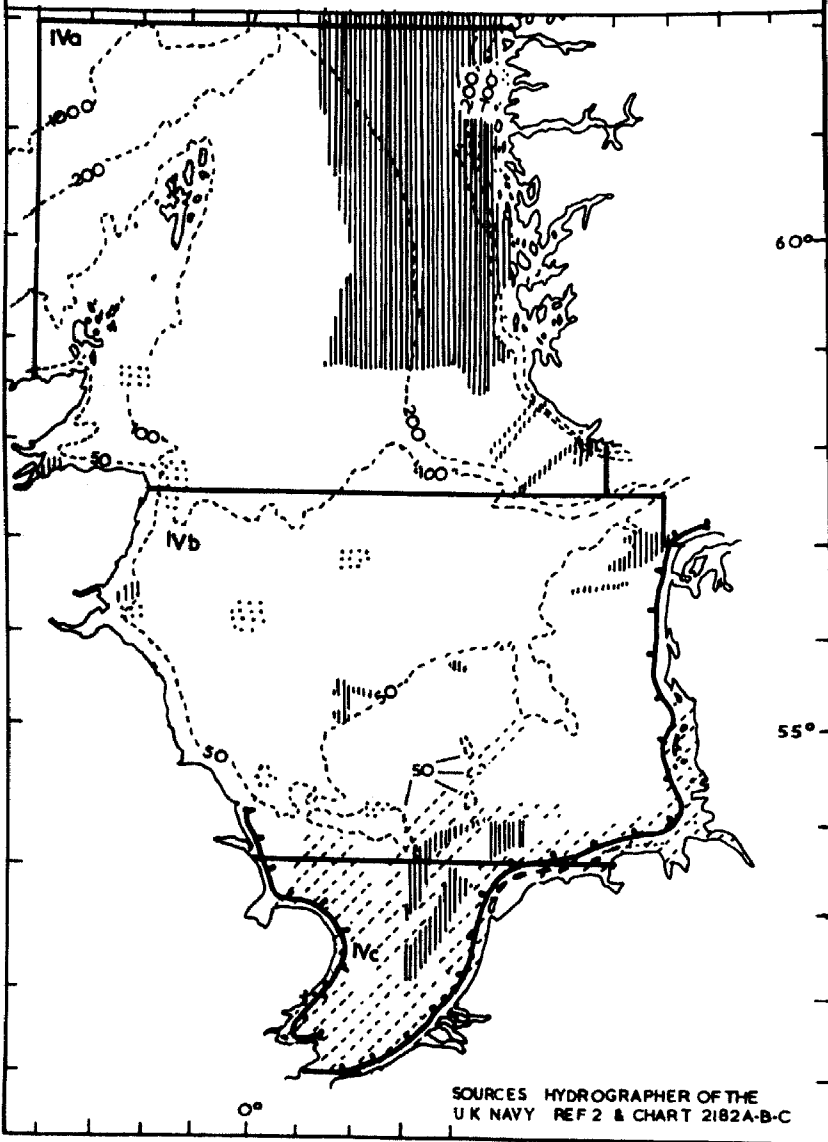
Finally to be considered are those uses which value the marine environment as a whole for "non-material" reasons, other than communication, extractive and additive material uses. These include defense, research, recreation, and conservation. The increasing significance of these uses may be regarded as a major factor in the increase in general awareness of maritime matters, as well as an influential factor in promoting more integrated management approaches.

The North Sea has been used more intensively for military operations than most other sea areas, because it lies in a strategic position at the heart of industrial Europe. For present purposes two factors arise. The first is the legacy of the war at sea during the two world wars, which has produced two major and lasting hazards, namely, minefields and related explosives, which have continued to be hazardous, especially for fishermen. Second has been the enormous number of wrecks, some of them made more dangerous by hazardous cargoes. The military use of the North Sea is also reflected in the conduct of training activities in coastal and offshore exercise areas reserved as submarine exercise areas, bombing and firing ranges; and the intermittent conduct of combined operations exercises, mainly under the auspices of NATO [30], and under continuous observation by Warsaw Pact nations.

As on land, the key thrust for the provision of scientific information in early days came from the military, in the form of hydrographic surveying, especially by the Royal Navy in the course of the nineteenth century. Despite intensity of use, attention has been drawn to the inadequate coverage of

FIG 5 THE MARINE ENVIRONMENT

- Submarine exercise areas
 - Changeable areas requiring periodic resurvey
 - Areas which have had an adequate comprehensive survey
 - in NSHC 1977 review
 - Low sandy coasts with extensive wetlands
 - ICES Areas IVa, IVb, IVc
- 50-- Isobaths in metres
- PROJECTION: MERCATOR



SOURCES HYDROGRAPHER OF THE
U.K. NAVY REF 2 & CHART 2182A-B-C

hydrographic surveys for modern conditions of use, and the need for continuous monitoring of the most intensely used areas [31]. In other fields of research, there has been continuous emphasis upon applied research, principally related to fisheries and pollution. Much of this work has been done by national fisheries laboratories, sometimes coordinated by ICES, including pollution baseline studies. More recently there has been intensive geological exploration and related environmental evaluation carried out by the oil industry. Research for purely scientific purposes has focused upon earth science research aimed at elucidation of the history of seabed deposits, and oceanographical and meteorological work for scientific and related weather forecasting purposes.

The recreational and conservation uses may usefully be considered together in the sense that these are concerned primarily with the appreciation of the marine environment. Although recreation is a very large industry, its impact on the coastal zone has been a spur to conservation movements in some areas. It is notable that the southern North Sea, together with parts of the Mediterranean and the Biscay coast of France, is a region in which the seaside holiday in some form is arguably the single most popular type of recreation. The pressure on coastal regions is exacerbated by the location of a substantial proportion of the population close to or within easy reach of the sea. It is likely that the environmental impact and conflict produced is only equalled by that of the offshore oil industry in the North Sea, although recreation is relatively concentrated in the coastal zone, and as such has hitherto been primarily a problem for land use planners.

The conservation of the living resources of the North Sea has of course been a prime objective of fisheries management for a century. Interest in the conservation of ecological characteristics is more recent, and has been largely limited to the coastal wetlands of the south, consisting mainly of pressure groups informing planners and governments concerned with the Dutch Wadden Zee. Much has been achieved by international scientific and conservation interests whose concerns have focused on the Wadden Sea coasts of Denmark, West Germany, and the Netherlands [32]. The need to consider the ecology of the open North Sea as well has recently emerged with attention devoted to multi-species fishery management problems [33], which have arisen in the wake of the collapse of the herring stocks.

The Legal and Administrative Divisions of the Sea

The legal and administrative divisions of the sea continue to evolve from the processes and frameworks outlined above. The first significant spatial division of the surface, between the territorial sea and the high seas, dates from early modern history. There are many complex administrative sectors within the territorial seas and the new exclusive fishing zones (EFZs). In contrast, the rapid seaward extension of jurisdiction over the continental shelf fuelled by hydrocarbon prospects has been exceptionally clear cut. The only major issue proved to be that

FIG 6 DIVISIONS OF THE SEA

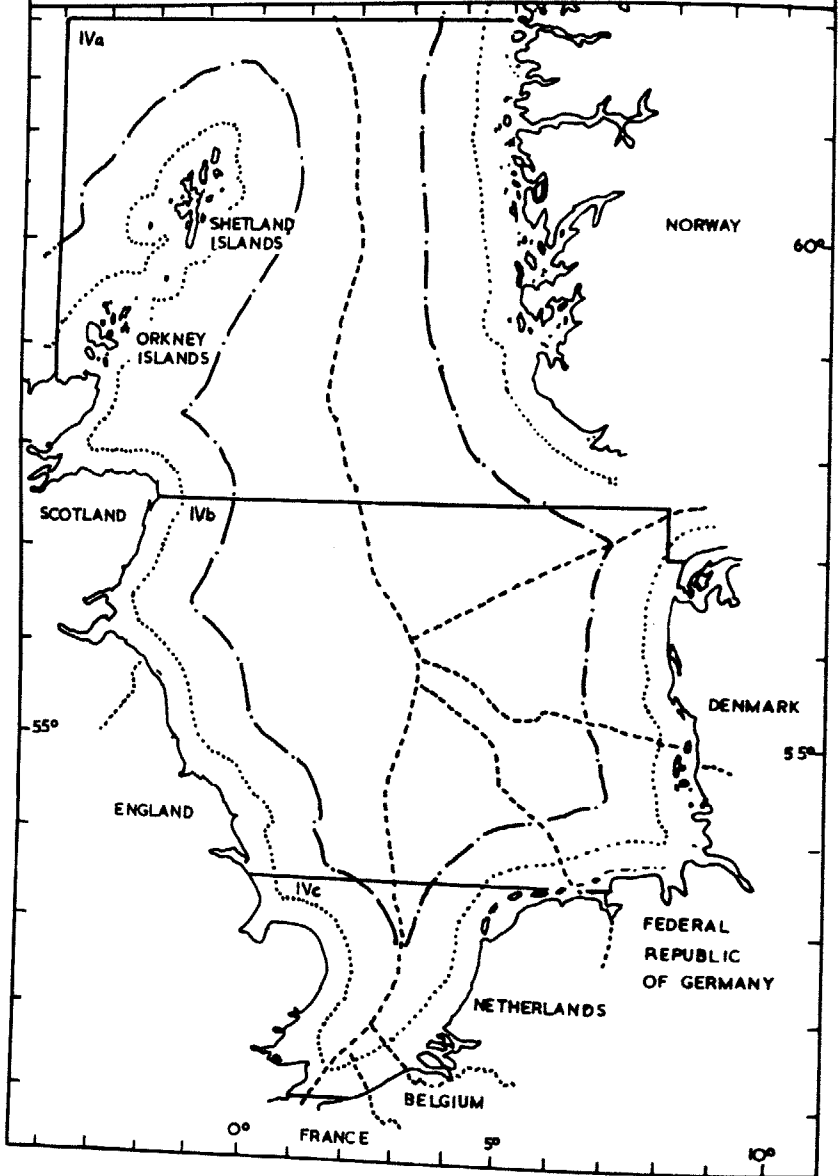
..... 12 nautical mile limit

— 50

----- median lines

—— ICES Area IVabc

PROJECTION: MERCATOR



of the share to be allocated to the Federal Republic of Germany [34]. With some difficulty, it was possible to work out subdivision arrangements between those states (Federal Republic of Germany, Denmark) with limited hydrocarbon resources, and those (United Kingdom, Netherlands, Norway) with substantial prospects. Traditionally, fisheries have been regulated in accordance with territorial seas limits. However, pressure for national and even local regulation of the water column continues to build up.

The coastal zone as a whole constitutes a special case in the management of the sea [35]. In the southern North Sea it is especially important because of the great intensity of multiple uses discussed above. The management of this area is primarily the responsibility of the land use planners and the river and port authorities, but overall management is lacking. The wadden seas apart, there is no real coastal management approach in individual nations or groups of nations in the North Sea comparable to, say, the U.S. approach evidenced in the Coastal Zone Management Act, which recognizes the coastal zone as a special area. Jurisdictional conflicts and complications have militated against any coordinated approach to marine planning [36], even though most spatial and environmental planning *per se* is restricted to this area.

THE ESTABLISHMENT OF A MULTIPLE USE APPROACH

The Long Term Context

A detailed historical analysis of the problems of conservation and conflict surrounding marine and coastal uses might well reveal that much of the pressure has been due to the advent of the offshore oil industry, and to the greatly increased pressure on the coastal zone produced by the expansion of recreation and continued industrialization, a significant proportion of which is itself oil-related. But there are a number of other key issues which are not primarily spatial in the first instance. These include the continuing problems of navigational safety and traffic management, fish stock conservation and related ecosystem changes, the allocation of fishery resources, and the nature and level of pollution, all of which have implications of a spatial nature.

The degree to which these issues require new approaches, and in particular multiple use planning, is open to debate, and a first stage is the establishment of criteria upon which to base judgment. Environmentally, the problems of fisheries management, ecological conservation, and coastal pollution are considerable. Economically there are substantial costs and benefits to be gauged in the proper management of the resource, though much detailed analysis arguably remains to be done. The conflict between oil and fisheries has been subject to this type of approach.

Social and political factors have been most clearly evident in the controversies surrounding the onshore impact of resource industries, especially the impact of offshore oil development,

and the implications of restructuring the Western European fishing industries. Coastal management and conservation is also an emerging focus of interest in this context. Legal development is complicated by the problems of the coastal zone and the increasing sphere of responsibility of the EEC.

The Existing Framework

There are two important points to make about existing management structures in relation to the North Sea environment. Those activities, which are firmly located in relation to the coasts and seabed, are strongly controlled by central state administrations, although certain matters are subject to global conventions on shipping and marine pollution control. The activities include shipping and port management, seabed and subsea mineral extraction, recreation and related coastal zone management, river basin management, and a good deal of scientific research including hydrographic surveying. In contrast, those activities which are dependent upon the water column, notably defense, fisheries and pollution control, can be brought under a strong regional framework, which should not be underestimated despite the political difficulties attached to fisheries management and pollution regulation from time to time. Although national control is substantial, it is in these fields that regional management is developing most rapidly, albeit extending to the Northeast Atlantic and adjacent waters rather than just the North Sea.

These management structures, and the uses and environment with which they are concerned, have been the focus of sustained interest over the past decade [37]. From the institutional point of view, ocean management has been regarded as a "challenge of disorganized opportunities" [38] in a number of quarters. But on the whole, a distinction has been consistently maintained between the seabed and coasts, on the one hand, and the sea itself, on the other. Further, ocean management has remained closely tied to cognate land management in most fields. Organizational structures vary in detail from country to country, as each national system represents in many respects the outcome of a history of responses and to a changing succession of national and international political priorities and considerations.

Viewed in terms of objectives, the emphasis continues to be decisively functional: the approach is management-oriented rather than planning-oriented in practically all fields except defense. Also, the objectives are usually those of the cognate organizations, or even of national government. Although spatial management techniques are used as a subsidiary tool, "spatial management" as such is low in priority. It is this situation which has led to suggestions for "sea-use planning" [39].

Integrated Management Approaches

The practical approaches to multiple use management may be initially considered in relation to the considerable element of spatial management already in existence. The most significant

aspects of this include navigation provisions for ports and some open sea areas, mineral exploitation licensing, fishing limits, waste disposal licensing, pollution, and other scientific monitoring systems. Also important are surveillance systems for resources and defense, emergency systems, and military strategy. Arguably, only defense is a true planning system, and corporate planning by oil companies and "structure" planning by local authorities treat the marine environment in a peripheral way. Fisheries plans are in the offing, but not applied.

The reorganization of maritime administration as a whole is, of course, a topical subject. It may be considered at national, regional, and local levels. The dominance of the national level is clear. The problems of regional administration by supra-national authorities are also clear from the immense political difficulties encountered by the EEC in the maritime field. At the local level the situation is likewise difficult, notwithstanding the great efforts of such bodies as the Scottish Island authorities and related interests.

Whether or not further fundamental reorganization of maritime affairs continue, and the signs are that it will, the question remains how multiple use management issues are to be handled. One possibility is that these could continue to be handled by functionally oriented organizations. An alternative approach is to create a special organization. Already, for example, there are moves to create a consultative North Sea Forum with a European framework [40]. But the structure, legal status, functions, and geographical sphere of responsibility of a fully fledged planning organization remain problematical. Its creation would have to be an international (or supra-national?) political decision, taking fully into account the enormous functionally oriented management infrastructure already in existence, with its present regional and functional connotations.

A General Interaction Approach

A less ambitious, and perhaps more realistic, initial approach is to begin with existing organizations and legal frameworks. In the first instance, understanding may be furthered by developing a general interaction approach with regard to uses, organizations, and places, giving due weight to the legal situation. As far as uses are concerned, there exist interaction matrices [41]. In the North Sea the number of uses is large, if not comprehensive, in range, and the number of interactions is even more considerable. Criteria for assessment of these interactions must, of course, be established; it may be that an analysis of locational and environmental relationships, and legal cases, with due reference to social and economic considerations will form the basis for continued refinement of these matrices.

Classification by users, or organizations, may be a more meaningful approach to decision-making. A good starting point is to analyze the existing provisions for dealing with interactions within each field. In spatial organization terms,

It may only be national defense departments and NATO [42] which take account of this. In mineral extraction, the problems are addressed in liaison with the private sector through the offshore operators' associations, whose committee structures reflect these considerations to some extent [43]. The interactions of fisheries are arguably only fully reflected at the research and advisory level in the working group structure of ICES [44]. For the remaining uses organizational structures are largely absent, except in the sense that certain scientific research and conservation organizations are concerned primarily with a range of interactions [45].

The location aspects of a general interaction approach is at once the most obvious, and yet perhaps most difficult to deal with, as it must form the basis of multiple use environmental management and planning. It is made difficult first of all by the legal constraints already referred to [46]. However, perhaps the data problem is paramount, since, except in the key area of hydrographic survey material, data on specific locations is generally organized functionally rather than regionally. Thus, it is at this point that serious attention must be devoted to more systematic and perhaps theoretical approaches to management and planning.

Analysis of Organizations

The essential elements of management, upon which decision-making is based, include the law, administrative organizations, the uses, and the information input and output. So far, the uses have been the primary criterion in organizing maritime management. Major objectives of the organizations tend to be functional -- e.g. fish stock conservation, mineral depletion policy, marine safety, and scientific research -- rather than environmental or spatial. The formulation of a locational system of management would require a common approach based upon analysis and use of the existing substantial systems. Further, such a system should be as simple as possible, with the minimum number of organization, user, and data categories commensurate with attaining its, as yet, poorly defined aims.

The starting point would be a classification of the existing organizations involved in management, including both specifically marine management organizations and those with ocean management objectives as part of their wider functions. Such organizations are the concrete expression of marine management decision-making. A preliminary analysis suggests an eight-element classification based firstly upon governmental and non-governmental divisions. These are then classified empirically in the first instance in terms of geographical and political scope and function thus: local, national, supra-national, international government, quasi-governmental organizations, industrial organizations, "information" (R&D) organizations, and special groups. Obviously problems arise and the classification is to some extent arbitrary. At the present stage of research, however, it seems useful to identify the main decision-making organization units, as a first priority.

Specialists in land planning may not have taken sufficient account of the merits of this approach, due to their preoccupation with the production of master "uses" plans.

Analysis of Uses and Data

As already noted, classification by uses provides a ready means of classifying the organizations. Although the sea is not used for human settlement as such, the range of uses is surprisingly similar to that on land. An elementary spatial interaction approach is to produce matrices which both classify uses and demonstrate interactions. However, in a fully fledged spatial management system, simplicity would suggest a simple categorization into spatial organization of the sea with the emphasis upon communications uses, the material uses of resource extraction and waste inputs; and the "non-material" uses: defense, research, recreation, and conservation.

Apart from the interactions of the users themselves, the nature and availability of information relating to management issues remain perhaps the most influential factor in the perception of problems. As any spatial management system would presumably use data from the enormous infrastructure of existing management institutions, the first priority is the classification and analysis of existing data sets which are themselves evolutionary and complex. In designing such a classification the first need is for a simple but comprehensive approach, which may be used with complex and diverse data sets, and yet which is as far as possible clearly related to these, bearing in mind that they have been constructed with very different objectives in view. It may also be important to have a common system, which is as far as possible a model of the real world of man-environment interactions.

Current work has produced a preliminary five-element data classification. In fisheries, for example, the basic divisions are respectively, fish stock/catch data, method of capture, fleet data, landings, and products. These may be generalized respectively as environment/activity interactions; technical elements relating to these interactions; the operating or control units in the environment; the output of the use system in the environment; and the "final demand" components which are the starting point for the operation of the system. Further works in progress will try to elaborate and refine the approach for application to all of the use areas [47].

An Information System Framework

The outcome of the review of organizations, uses, and data is to produce a theoretically based general interaction approach for which matrices have been selected as the basis of information storage and retrieval [48]. This involves combining the organizational and data classifications just outlined into an 8 x 5 primary matrix for each major use category. Thus in the fisheries case, for example, all data on method of capture held by national government departments may be readily stored in the matrix.

FIG 7 A MATRIX EXAMPLE
-illustrative only

A Biological Resources	RESOURCE	METHOD OF CAPTURE	FISHING UNITS	LANDINGS	PRODUCTS
LOCAL GOVERNMENT					
NATIONAL GOVT DEPARTMENTS					
EUROPEAN ECONOMIC COMMUNITY					
INTERNATIONAL INSTITUTIONS					
GOVERNMENT AGENCIES					
INDUSTRIAL ORGANISATIONS					
INFORMATION ORGANISATIONS					
SPECIAL GROUPS					

B National government departments/ method of capture

		PELAGIC TRAWL	BOTTOM TRAWL	NEPHROPS TRAWL	SEINE NET	PURSE SEINE	LINES	TRAPS	OTHER GEAR
		1	2	3	4	5	6	7	8
DAFS UK	1				R G	Y B			
MAFF UK	2								
FRANCE	3								
BELGIUM	4								
NETHERLANDS	5								
DENMARK	6								
NORWAY	7								
GERMANY	8								

R TIME SPAN
Y QUALITY
G AUTOMATION
B ACCESSIBILITY

SOURCE:
LALWANI & SMITH
(REF 48)

Further subdivision relating to the first-order classification may then be used to produce a secondary matrix which approaches more closely to the original data sets. For example, statistics relating to purse-seine catches held by the Department of Agriculture and Fisheries for Scotland may be retrieved. Vector coding is employed in the matrices to retrieve data in a variety of forms including maps, statistics, and documents. As far as possible the basic data is specified in terms of holders (including location) time span, format and quality (including accuracy), automation, and accessibility. A logical extension may be to include information on users.

It is envisaged that the marine activities may be covered by as few as five matrix classes: namely, spatial organization, mineral resource exploitation, biological resources and fisheries, waste disposal and pollution, and the marine environment covering defense, research, recreation, and conservation. The full set of primary matrices corresponds with the disaggregation of the basic set in each of the five cases. For example, the main components of the mineral extraction set are hydrocarbons and sand and gravel. The coastal zone is again a special case. It may be most conveniently handled in the first instance by adding a coastal zone primary matrix to each of the five categories.

CONCLUSION

The initial reason for designing such an information system is that it may be used as a research tool systematically to build up data and examine interaction problems in depth within a spatial management context, as a first step towards a multiple use approach deemed desirable in further examination and possible implementation of spatial sea use management and planning measures. Whether such an approach is desirable remains open to debate, as does the information system any integrated management body might use. Meanwhile, work is continuing on the development of the information system, and attention is also being devoted to consideration of abstractions which may be made from the system to produce environmental interaction and impact manuals suitable for specific groups of users.

Finally, the North Sea must be set in the wider context. From a European point of view, it is the easiest sea to manage in the substantial measure of agreement among the states involved, already evident in the division of the continental shelf and the working of ICES. There could conceivably be pressure to adopt similar approaches for the Baltic and Mediterranean. Rather strikingly, other world sea areas subject to intense use, such as North America, South Africa, and parts of Australia and New Zealand, are mainly located adjacent to single federal states rather than multi-state situations. In the developing world, the major multi-state complex occurs in East Asia. In many tropical and polar areas, emphasis may fall upon conservation rather than conflicting uses as the primary management concern.

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COMMENTARY

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I think both the review of the present situation and the suggestions about designing an information system as a first step towards a multiple use approach, presented by Drs. Couper and Smith, were most interesting. Since I have not been able to find any statements or ideas in their paper that I strongly disagree with, I shall give some comments of a more general nature, stressing some of the problems related to North Sea management and planning. I am primarily going to address the policy problems related to ocean management and the activities at the national level, both crucial factors in the management of the North Sea.

First, I will pose the question, is there a need for a revised and more comprehensive management system of the North Sea? The majority of those doing research in this field tend to answer this question in the affirmative. A trivial fact that sometimes seems forgotten, however, is that researchers most often have only limited influence upon the future developments(s) of the North Sea. Rather, the future of the North Sea will be decided by the politicians in the North Sea countries, the users of the North Sea, and the people living in the North Sea countries. The answer to this question is hardly obvious to all these actors.

Most users of the North Sea represent sector interests and are seldom preoccupied with the totality of the activities of the North Sea. The "ordinary man" does not like oil on the beaches or contaminated fish, but the protests are most often limited both to certain areas and to certain times. There is no mass-movement or rally from the "people" calling for a more comprehensive and coherent North Sea policy. The politicians who are supposed to transcend the sector perspective and to evaluate problems on the basis of their effects on some aggregate measure of utility, do not seem to give this problem very high priority either. Even though these statements are quite trivial, I think it might be useful (assuming they are correct) to keep them in mind for those doing research in this area.

Using a somewhat more "objective" or logical approach, several arguments can be made for the need for better coordination of the multiple uses of the North Sea. As we have heard, the North Sea has become the subject of increasingly intensified and diversified use by an increasing number of actors. The activities of one party frequently affect the interests of other users. The proposal for some kind of coordination or integration thus seems logical. Some measures along these lines have been taken, both on the national and international level. An enormous number of committees and

organizations -- national, international, intergovernmental, and nongovernmental -- have been set up, which in one way or the other are concerned with various aspects of the activities in the North Sea. These organizations undoubtedly work with a lot of effort, but it is difficult to observe any consistent coordinating policies, either horizontally or vertically, emanating from the work of these organizations. This may lead to a call for some kind of supranational authority able to take a panoramic view of the totality of the activities in the North Sea. In my opinion, little realism can be attributed to such a suggestion. A large, overarching organization is not necessarily more efficient than smaller units working closer to the actual activities and problems, provided there is some kind of interrelatedness in their work.

To the extent there is a need for improved North Sea planning, and there probably is, the most realistic approach seems to begin with improving and coordinating the activities of existing organizations and the existing legal framework. The reason for stating this opinion is closely linked to the starting point of this comment: The policy problems related to a more comprehensive North Sea management system. I do not think that the governments of the North Sea states have too much enthusiasm for extensive institution-building of this kind. Rather, they prefer to retain as much national control over the different kind of activities as possible. A major new supranational body will hardly be looked upon with favor by the North Sea states.

To my mind, the slow progress towards a consistent policy is not primarily due to problems of a technical or legal nature, but rather to the lack of political will. At the international level a coordinated marine policy for the North Sea seems to have a low political priority. The political pressure seems to be marginal, and bureaucratic procedures tend to come to the forefront. Fisheries, shipping, mineral extraction, and to a certain degree also pollution, attract the attention of all governments bordering the North Sea, but not marine policy in general. At the national level, at least in some of the North Sea countries, there seems to be a slowly growing awareness of the interrelatedness between these issue-areas. So far it is quite weak, one major reason being that the level of conflicts between the different activities is rather low, or at least it is perceived in such a manner.

For those claiming that most ocean-related problems, including ocean management and planning, can only be solved at the international level, it might be looked upon as a step in the wrong direction to stress the significance of ocean management at the national level. I would claim, however, that marine policy-making at the national level is quite decisive for the future of North Sea planning. An integrated national policy might be a necessary, if not a sufficient, precondition of an overall ocean management system for the North Sea, especially after the adoption of the 200-mile economic zone. It is no longer only the seabed of the North Sea that is split into

national areas. So also is the water column, and to a certain extent the surface of the sea. Unless the problems related to an integrated marine policy are perceived at the national level, I think the chances are slim they will ever be discussed in a serious manner at the international level.

This emphasis on the importance of a national marine policy for the future of the ocean policy of the North Sea gives me an opportunity to say a few words about the way in which ocean management is being conducted and perceived in Norway. The sea is very important in Norway, probably more so than is the case in other North Sea states. Activities such as oil and gas extraction, shipping, and fishing all represent important sectors of the Norwegian economy. The conflicts arising from these and other ocean-related activities have so far tended to be rather low-level conflicts. Those conflicts and linkages that have attracted attention have been bisectoral rather than multisectoral. The policy being developed has therefore been characterized more by adjustments at the bisectoral level rather than comprehensive coordination arrangements at the multisectoral level.

The sharpest conflict has been between the oil and fishing industries. In the initial phases of the oil and gas activities on the Norwegian continental shelf, the interests of the fishing industry were inadequately represented in the decision-making process. Partly as a result of pressure from the fishermen's organizations, the institutional structures and procedures have been changed, and today seem to be satisfactory, even from the viewpoint of the fishermen. To the extent that the oil interests prevail over fishing interests now, it is a result of policy decision, not of poor ocean planning.

The fact that the level of conflict has been rather low, and has tended to be bisectoral does not imply that the question of a more comprehensive and overall coordination of marine policy has not been raised. The question of a superagency for marine policy was discussed in a parliamentary report some years ago. The conclusion was that the cost of such an institution would outweigh its expected benefits. The question has been put back on the agenda quite recently, by the former Minister of Fisheries, but by and large very few have challenged the conclusion of the report.

In other words, little has been done in terms of comprehensive sea use planning, and no plans seem to exist that will radically change the present Norwegian approach in dealing with marine affairs. The reason seems obvious; the decision-makers do not perceive a need for such a plan. New inter-use linkages are, however, constantly developing, and demands for more comprehensive sea-use planning may grow in the future. It does not seem probable that such demands will result in radical institutional innovation within the next few years. If and when such a need arises, serious problems may arise, in implementing a coherent marine policy, simply because systematic data and information on the different resources and activities are lacking. In other words, there is probably bound to be a

considerable time-lag between a decision to create such a plan and the feasibility to implement it. Even within such a relatively limited area as the North Sea, the data base is weak. In my opinion, this is one of the areas in which researchers may contribute significantly towards the realization of ocean planning in the future. The research being conducted by Drs. Couper and Smith seems very useful and valuable in this respect. Before leaving the subject of national offshore drilling, I would like to stress that the absence of an overall ocean management plan does not imply that policy in this field is accidental and incoherent. Even if marine policy in Norway cannot be said to be guided by clearly formulated goals, sector planning and new procedures seem so far to have been rather efficient in solving inter-use conflicts.

The future of national ocean management cannot be predicted only by looking at the internal forces and development. The ocean has been referred to as the "tragedy of the commons"; and one of the favorite concepts in political science, "interdependence", seems to have special relevance here. The manner in which ocean-related activities are regulated in one North Sea country often has profound consequences upon other nationals in this area, and vice versa. This mutual dependency calls for cooperation and consultation as a means of incorporating the interests of these countries in decision-making. If this is done in a balanced way, by weighing costs and benefits against each other, it might reduce the possibility of conflicts and countermeasures in the spheres of interest controlled by other states.

Apart from the need for consultation procedures, clearly formulated goals and somewhat rational decisionmaking process are probably prerequisites for such a policy. Findings from a current research project indicate that actual policy falls short of this ideal. A certain discrepancy seems to exist between the Norwegian decision makers' perceptions and those of the decision makers of the other North Sea countries regarding Norway's willingness to take other countries' interests into account, and especially regarding her willingness to consult and inform other countries before decisions are made. The reasons why this is so are probably complex and manifold, but this observation may indicate a need for improved consultation and cooperation procedures among the North Sea user states.

Finally, as to the future of North Sea planning, it is probably safe to predict that things have to get worse before they get better. In other words, as long as there are, or at least are perceived as being, relatively few acute conflicts or collisions between different activities, no radical innovation can be expected. On the other hand, because of the enormous complexity of ocean planning, the tools for an efficient planning system ought to be developed before the conflicts will mount. This will be an intriguing and demanding task, but I think suggestions like those presented here today are most useful in this respect.

COMMENTARY

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Unlike the other speakers, I'm not closely familiar with the problems of multiple use ocean management. My preliminary thinking about it is pretty rudimentary and comes from looking at the problems that present themselves in the Gulf of Maine. So if my views sound a little limited, it may be due partly to the geographical orientation of my thoughts these days. The Gulf of Maine is a region that seems to require a serious approach to these problems and is certainly a very different setting from that of the North Sea which we have been hearing about in very interesting detail from the previous speakers.

Perhaps I could divide my short presentation into two parts. In the first part I shall outline what seem to be the three salient models of multiple use ocean management, at least for the Gulf of Maine: the three that occur to me as the main alternative modes of thinking. In the second part perhaps I could talk briefly about each of these, as they seem to apply to that region.

The three models that occur to me are the bureaucratic or administrative, the transactional, and the organizational. Now I concede at the beginning that one can predict that in the years to come elements of all three models will get hopelessly mixed up in practice. All the more reason, I would suggest, to try to separate them now, ahead of events, and see what we can learn about the significance of these different approaches. If we are bound to end up with an eclectic mess, at least we can try to discern that ahead of time and perhaps head off the worst excesses of eclecticism.

What I'm calling the administrative or bureaucratic approach to multiple use ocean management would be an approach that begins with the argument that the new zones of national jurisdiction, whether economic zones or continental shelf zones, are after all extensions of national jurisdiction, and therefore extensions of the public administration system of the coastal state, or of two coastal states in the case of the Gulf of Maine. With that point of departure one argues that the onus falls on him who would argue for introducing significant changes in the existing land-based system (or systems) of public administration if projected out to the ocean. The onus falls on the person who wants to make significant changes to take stock of the oceanic properties of these regions. Presumably also with this point of departure, one accepts as inevitable the kinds of bureaucratic politics, for example, that come with a public administration approach. Above all, this model gives saliency to the problem of coordination of existing national agencies and mandates.

If we think of this model projected in different regions of the world, I think we have to predict divergence rather than convergence emerging in state practices, since there are significant differences and variations in public administration systems and practices around the world, not least because culture plays a role. Therefore, in the absence of any assumption about change in the existing land-based systems, you would have diversity in ocean management around the world under this model.

The second model I call transactional, because instead of focusing on the existing bureaucratic system, like the first model, it focuses on process. It assumes at the beginning, particularly if applied to a shared region or shareable region like the Gulf of Maine, that maximum attention will be given to the transactional aspects of rational ocean management in the region, that a great deal of thought would be given to the problems of diplomacy, and that it would therefore be vulnerable, or at least sensitive, to the political systems of the two countries. That, I would think is the essence of the transactional approach. It assumes the desirability of flexibility of response to changing conditions, to changing data in the region. It assumes the need to come back to the negotiating table every so often to revise and review. It assumes political vulnerability may even be desirable under some concept of democratic philosophy, that it is desirable that the electorate should have a voice in everything including technical problems of ocean management. We have the recent experience of the East Coast Fisheries Agreement in the Gulf of Maine between the United States and Canada, which failed precisely because this transactional approach to ocean management became exceedingly vulnerable, as we all know, to the political system, especially that of New England. So the valiant work that was done by the diplomats was undone by the political system. We should have learned something from that.

The third model, the organizational model, assumes that it is desirable as well as possible to begin with a perception, a comprehensive view of the requirements of the region that would require maximum use to be made of all existing mechanisms. So the focus would be not so much on bureaucratic systems or transactional processes as on networks of global, regional, and national mechanisms in a very complicated framework of coordinated arrangements. This, of course, requires us to be analogical in our thinking, to draw upon ocean management experience in other regions of the world. We may, for example, ask what we have learned from United Nations "action plan" thinking, the contemporary pattern "framework" thinking about complex problems in the late 20th century. Perhaps we should be looking at the Regional Seas Programme of the United Nations Environment Programme to see the similarities as well as the dissimilarities between these regions and our own region in the Gulf of Maine.

To avoid the difficulties with model two, the transactional, one would want to design an Action Plan that

would not be too vulnerable, at least initially, to diplomacy or to the political system. So you assume under model three that it is humanly possible to bring together very considerable human capabilities to design a proposed, albeit unofficial, Action Plan for the region.

This may not be such a visionary notion, because, as many of you in this room know very well, the first step has been taken, albeit tentatively, to draw together the university communities of New England and the Maritime Provinces to give some collective thought to the case for a concerted study of the problems of multiple use ocean management in the Gulf of Maine. Indeed a workshop to this end is being held in October at Digby, Nova Scotia, co-sponsored by various research organizations of the two regions of New England and the Maritime Provinces. Without purporting to predict the outcome, I think it will be interesting to see what kind of common thinking can emerge from that meeting of minds.

These are the three models. If we apply them to the Gulf of Maine, I would suggest that the first is immediately to be rejected. Why would anybody wish to propose that the Gulf of Maine should be managed by two separate and distinct national bureaucratic systems: the American on the U.S. side of that line still to be drawn, and the Canadian public administration system on the Canadian side? I cannot think of any rational merit to that idea whatsoever, although for reasons of political failure this may indeed be the short-term outcome.

What about the other two models? It seems difficult to choose between them, but I would have thought that, immediately after the experience of the east coast fisheries failure, this is hardly the time to strike out confidently in the direction of the transactional model applied to matters of ocean management that are much more complicated than matters of fishery management. So I'm inclined to suggest that if we are to experiment in one of these three ways, it should be primarily in the organizational manner.

DISCUSSIONS AND QUESTIONS

GEIR ULFSTEIN: I would like to address a question to Professor Treves. He referred to various provisions in the UN Convention on the Law of the Sea on the duty to give due regard to the rights or interests of other states. But is this "due regard" rule a part of customary international law, or only part of this Convention? For example, is the coastal state's right to impose restrictions on shipping in its exclusive economic zone in the interest of fishery protection qualified by, or subordinate to, its duty to give due regard to the shipping interests of other states?

TULLIO TREVES: As to the second question, I would say that the coastal states' right is qualified by its "due regard" duty, because shipping is one of those activities which are free for the coastal state as well as for third states in the economic zone, whereas fishing is an activity over which the coastal state has sovereign rights. These sovereign rights are intended under the Convention to be restricted by virtue of the coastal state's duty to exercise them with due regard to free activities such as shipping. It is difficult to say how far a coastal state can go in restricting shipping to protect fishing. We might draw some analogy from the situation of installations on the shelf, where the competition between uses is the object of more detailed provisions. I don't think fishing should get better treatment legally than oil exploration and exploitation.

As to the first question, I think at least on aspect of the "due regard" rule is customary in origin: that part which applies to the high seas. It exists in the 1958 Convention on the High Seas, and seems to be a general rule. Also, in the 1958 Convention on the Continental Shelf there is a "due regard" rule in the form of a principle of non-interference. To the extent the exclusive economic zone regime already exists in customary international law, I would say that a customary "due regard" duty also now exists in the EEZ, at least as it applies to fishing within 200-mile limits. Admittedly the detailed features, as distinct from the general principle, of the EEZ regime may not yet be established in customary international law. Detailed rules and exceptions, and exceptions to exceptions, can only become binding through written law.

LEWIS M. ALEXANDER: I think the enclosure movement has set regional planning back perhaps 50 years. Countries having just acquired more real estate in the 200-mile zone are less likely than ever to go into serious planning on a regional seas basis. I think they would do it if they saw a common danger or if they could conceive of a common benefit coming out of really serious planning. So far as a common danger is concerned, two seas where the common danger has been recognized are the Baltic Sea and the Mediterranean, in both cases because of the very low flushing action of the seas. There is a very serious pollution problem there, which is not true in the North Sea yet because of

the water movement. And in both of those cases the countries around the seas have done something about this.

In the Baltic Sea recently a convention went into effect. In the case of the Mediterranean, they've been lucky enough to be the pilot project for a very energetic regional seas program under a very energetic director, Dr. Keckes, who almost single-handedly and with some money has brought the 16 Mediterranean countries together in pollution control operations. We have to wait and see how much real effect this whole program has, how much more money he's got, how much more time he's got. But at least a serious effort along these lines has been made and something has happened. As many of you know, UNEP has other regional seas programs planned and beginning, though I understand with less money than was put into the Mediterranean Action Plan.

I think it's very good to gather information in leading towards some type of regional seas management, but I think I'd like to ask the two gentlemen from Britain, what do you honestly expect to come out of a North Sea type management plan? Is this merely something to avoid disaster? Is it something to look ahead to in the future?

I should also mention you talk about whether the governments are really organized in a way which sets apart the marine activities. In the United States we went through a period when we had a very strong senator in Senator Magnusson from the state of Washington, and also a president, in this case President Johnson, who decided the seas were very important. And for a relatively short time, we began to be reorganized toward a sea agency. But unfortunately, the tides have changed and this no longer happens. This may also be true in Europe.

ALASTAIR COUPER: Thank you for these comments, Professor Alexander. I certainly agree with the first one. It is very unlikely that one would achieve a regional bureaucratic organization for the North Sea. But I think there are perceived dangers in the North Sea which seem unavoidable at some stage if regional coordination doesn't take place. One is moving towards this gradually.

What we are trying to do is identify the degree of control over each use by the various bodies around the North Sea basin. When one does this, what emerges is an extremely complicated pattern. One would expect national control over coastal zone management. There is no indispensable regional component.

Similarly in petroleum development, it is primarily a national effort. None of the countries in the North Sea will allow any interference with their decisions where they will allow drilling, the rate of depletion of the resource, and so on. These are national decisions. But here also one begins to see small regional components related to safety, action on rig disasters, and so on.

In minerals (sand and gravel aggregates), again decisions tend to be national, but it's very difficult to make these without a regional component, because of the fish stock

involved. The countries around the North Sea are dependent on the same stocks of fish. The fish circulate in the area. The action of extracting sand and gravel, though it doesn't interfere with adult fish, does interfere with the hatcheries in some species. One country may regard the fishery as less important than the sand and gravel aggregates, but it must take into account the effect of this policy on the other countries, on the smaller countries dependent on the fishery.

Fisheries, of course, have a very strong regional component through ICES, and navigation in the North Sea also has a regional component. What we have found is that the bodies making these decisions haven't always had access to the facts that they need. They don't always know the degree to which there is dependence on fisheries, in the case of the sand and gravel operators. One could envisage a small coordinating group, perhaps without any real powers but at least being able to guide various sectoral users towards the data, which would then be used to determine the type of impacts that are likely to occur. That seems both desirable and possible to many of the users we've spoken to. It's a matter of getting that type of organization that meets their needs.

One might have thought that navigation would have been the easiest to coordinate. But in fact it does present difficulties. There are IMCO (or IMO) separation zones in the straits, and the countries have agreed on the Convention. But outside the straits, in the approaches, there is a very complicated pattern of traffic, partly because of the existence of these zones. You get many multi-ship encounters. So one has to extend the planning of navigation (vessel traffic management) beyond the zones. Recommended routes have been drawn up which really don't take full account of the concentrations of fishing vessels, nor do they take full account of the proximity of the rigs. Some of the recommended routes go very close to the areas of high intensity hydrocarbon exploitation.

What this study aimed to do was simply to identify whether there was a need for coordination, how it could take place. It's a very limited study in a sense. It was funded by the Science and Economic Research Council which has funded research into the bigger aspects of sand and gravel extraction, petroleum, and so on. They thought it would be a reasonable idea to look also at the impact side of it. So that's what we're trying to do.

JULIAN PARKER: I just want to take up a point that my colleague made a minute ago about the possibility that regional development plans will be downgraded as a result of UNCLOS III. I don't really think that's likely to happen. I just want to broaden things out a little bit. We still have the International Convention for the Preservation of Collisions at Sea, which contains some very straightforward rules: for example, that passenger vessels under way give way to fishing vessels. There's no need to regulate this. It doesn't give rise to conflict.

We might decide in the North Sea to extend the traffic routing system, or throw out the rules that vessels under way give way to fishing vessels. Both would be very big decisions. You can't just say that we'll change the routing system to accommodate these fishing vessels and then forget the collision regulations.

The other point I want to make is that there may be a great advantage in having an arbitrary median line as a boundary, simply because nobody can think of a better way of doing things. Government agencies, by and large, want to regulate things as efficiently as they can. The United States has a different coast guard structure to Canada, and its approach to ocean regulation is bound to be different. It seems to me that it may be simplest just to have a median line in a shared ocean area like the Gulf of Maine.

We haven't talked about customs barriers. We haven't talked about the policing of oil rigs and things of that sort. You need to have your constables on the beat. They need to follow one administration. By and large, there's a great deal to be said for having a simple line, even though it might not seem logical in the geographical sense.

BURDICK BRITTIN: I have a very brief comment which applies to this entire panel and indeed to the panel this morning. I think one of the subthemes this morning unfortunately was that the way to go in looking for something in a common arena is through unilateral action. This afternoon all the panelists have recognized that, regardless of how far their countries will be able to go, solutions will only be found along the international route.

EDWARD MILES: Well, I want to thank the panel for a most instructive set of presentations. If I might take just a few minutes to put on the table, as it were, my own impressions of the significance of this topic.

Two things are happening now. One is a really major jurisdictional revolution, for which the conference has been the midwife. The most settled part of that, in my view, is the question of coastal state jurisdiction over resources and a number of other uses; the most unsettled part is perhaps the question of navigation within the economic zone -- unsettled without the entry into force of the Convention, I mean. The other thing is quite different and doesn't in any way depend upon the jurisdictional revolution for its energy; and that is the trajectory of technological advance and the relationship to economics. These things come together in time and space, and we don't quite know how to think about them. We don't quite know how to deal with them. Even those countries which are the most advanced in maritime affairs and where the necessary infrastructure is present, do badly in trying to manage these activities. The coastal state revolution has resulted in coastal states, both developed and developing, having a great deal more authority with respect to the zone than ever before;

and the zone has become a multi-purpose zone. However, the coastal communities that have evolved historically are sectorally based, and the technologies are separate and do not talk to each other very well. Only recently, under increasing stimulus from production activities on the outer continental shelf, the oil people and the fish people have begun to learn to talk to each other.

I think the question posed by the panel is, what are the objectives of coastal state management of the zone? Presumably even any one single coastal state will have objectives that compete with each other. How do people deal with the task of deciding how to optimize their use of the area and its resources?

Some of these problems transcend national boundaries. But it is no good raising the jurisdictional question once again, when it has just been settled, or zeroing in at this early stage on the question of regional versus national jurisdiction. That, I think, would be counterproductive, because our basic task right now is an analytic one. We simply don't know how to think about these things well, and I think Tim Hennessey's presentation was an attempt to suggest how one might do so.

The Couper-Smith paper is an extremely important one, in my view, as it suggests a number of alternatives with some very realistic political objectives in mind.

Tullio Treves' masterful survey of the law, and the gaps in the law, leaves us with the very clear conclusion that this is not something in which the new law offers much help by way of guidelines. It's a question of developing adequate policy and adequate analytic tools for dealing with the problem that we face. It's a new problem. There are no successes. We had better continue developing the way we think about these.

It strikes me that international organizations, both global and regional, can play an extremely important role in this connection, both with respect to data and information exchange and to assistance to developing countries in developing adequate management approaches. At least that is my own interpretation of what the panelists had to say, and I would be very happy if that were widely shared.

Thank you very much for your patience.

PART III
THE UNITED POSITION
ON
THE LAW OF THE SEA

THE UNITED STATES POSITION ON THE LAW OF THE SEA

Dr. John P. Craven
Discussion Leader

JOHN CRAVEN: We all had our own anticipations as to the nature of the final session in New York City, and its probable outcome. Most of us perhaps anticipated that it would begin with a debate over the U.S. concerns and an attempt to accommodate those concerns, culminating in a final text which would have been brought to completion by a consensus of the entire conference.

It was, I believe, a surprise to almost all of the observers when the United States requested that there be a vote. It is already well known that within the United States administration there was a great debate whether to go along with consensus or whether to insist upon such a vote, and perhaps by the narrowest of margins the decision was made that a vote would be requested.

The result of this was that nations which would have been perfectly willing and pleased to bring the Convention into force by consensus found themselves in a position of having to declare either in the affirmative or in the negative, or to abstain. In the result, 17 nations abstained and four nations voted in the negative. The consequences of these votes are probably more profound than the votes themselves, or the magnitude of the votes. Therefore, it seems to most of us as observers that a perspective on the New York session would be in order, from the viewpoint of a number of people who have been closely associated with the Conference.

It is with that thought in mind that we convene the panel here this evening. Our first perspective will be presented by Dr. Renate Platzoeder, who has been a member of the delegation of the Federal Republic of Germany and who is a senior member of the staff of the Institute for International Affairs in Munich. It's my pleasure to introduce her now.

RENATE PLATZOEDER: From the discussions of this morning, one could gain the impression that the Convention on the Law of the Sea contains mainly provisions regulating deep seabed mining and military uses. It does not seem inappropriate to recall that the Convention represents a heavy and weighty document of 320 articles, 9 annexes and 5 resolutions dealing with all aspects of the uses of the sea and the sea-bed.

This panel is set up to deal with the future or fate of the Convention on the Law of the Sea, which was not adopted by consensus. At the request of the United States, the Convention was adopted by a recorded vote on April 30, 1982. The Convention is expected to be ready for signature by the end of this year. Therefore, to sign or not to sign, that is now the question to be answered by governments concerned about the development of the law of the sea.

It is evident that states which have voted for the adoption of the Convention are anxious to know whether the United States and other major industrialized countries will sign the Final Act of the Third United Nations Conference on the Law of the Sea and/or sign the Convention on the Law of the Sea. The United States and others have given ample explanations why they would not support the adoption of the Convention. The question of interest today is, however, whether all the arguments which have led the United States to cast a negative vote, and all the arguments which have led others to abstain, are still viable and will be used to determine whether those states will refrain from signing the Final Act and/or the Convention.

In my opinion, whatever considerations prevailed on the United States to request a recorded vote and vote against the adoption of the Convention, that decision was a very prudent one, not only with respect to the development of the law of the sea but also with respect to the development of international law in general. If the Convention on the Law of the Sea had been adopted by consensus or by general agreement, the overwhelming majority of states would have interpreted such a result most likely as the instant creation of customary international law. In such a situation the traditional legal institutions of signature and ratification, as well as the well-established principle that treaty provisions which provide new law are only binding upon parties having ratified that treaty, would have been weakened or perhaps even jeopardized. In this connection, I only want to refer to the United Nations Declaration of Principles governing the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction. The adoption of this declaration by the UN General Assembly in 1970, without votes against it, was interpreted by the overwhelming majority of states and very prominent lawyers from various regions as affirming the concept of the Common Heritage of Mankind as a principle of customary international law. As a consequence, it was concluded that national legislation on deep seabed mining as well as agreements among potential deep seabed miners constituted an unlawful act. But the adoption of the Convention on the Law of the Sea, by recorded vote, cannot be interpreted as creating or affirming new customary international law. The recorded vote clearly indicates that the Convention is unsatisfactory to a number of states from East, West, North and South. The adoption of the Convention does not contribute to the blurring of the two major sources of international law, customary and conventional.

In providing advice to decision-makers in my country, on the question whether the Federal Republic of Germany should sign or not sign the Final Act and/or the Convention, I have come to the following conclusions. The Convention on the Law of the Sea departs in many respects from our conception of a desirable legal regime for the uses of the oceans and its resources. We have stated on many occasions that a more equitable international political and economic order, for which there is a growing need, requires different solutions. In our view, a more

balanced attribution of rights and duties to coastal states, a more explicit definition of the legal status of the 200-mile zone as high seas, a more precise limitation of the continental shelf, a more liberal regime for marine scientific research and the incorporation of much more economically feasible provisions on the exploration and exploitation of the deep seabed, would have enhanced benefits for all countries and for the international community as a whole.

Nevertheless, I would recommend that my government sign the Final Act and the Convention and convince others to do the same. The Convention on the Law of the Sea is the first comprehensive international document covering all aspects of the uses of the oceans and its resources. Countless issues and problems arising from technological developments, from increasing numbers of sovereign states, and from new and more intensive uses of the sea, had to be identified, written into treaty language, systematically arranged and finally sandwiched between book covers. In my opinion, these significant efforts and achievements deserve to be properly safeguarded.

In addition, the Convention reflects not only the prevailing global power structure but also gives evidence of the intellectual capabilities, political aspirations and moral dispositions of the hundreds of delegates who have been involved in the negotiations throughout the past 15 years. Although one would have wished that more oriental wisdom and more common sense had dominated the deliberations, instead of philosophical and ideological disputes in the First Committee and national egotism in the Second and Third Committees, it is unrealistic to believe that a significantly different Convention could have been negotiated or could be achieved in the near future.

Furthermore, although 38 states have expressed dissatisfaction by casting a negative vote, abstaining, or being absent when the Convention on the Law of the Sea was adopted, I firmly believe, from my experience of being part of the negotiating process for many years, that there is enough common ground and mutual understanding to achieve generally acceptable solutions in practice. The reason for this assumption is that I do not consider the 130 votes in favour of the Convention as clear-cut support for the entire content of the Convention, and I do not consider the votes against it, as well as the abstentions and the non-participations, as clear-cut rejections of the Convention as a whole. Of course, one recalls the philosophical and ideological disputes and endless debates over the deep seabed mining regime, as well as the arguments of a number of states with long coastlines and broad continental shelves fighting for a multitude of sovereign rights and jurisdictions. If one reads the Convention in light of the numerous possibilities for such disputes to continue, and for various provocative actions to follow accordingly, one is certainly tempted to search for ways and means to prevent the Convention from entering into force.

In spite of these arguments, the fact remains that 130 states have expressed the opinion that the Convention on the Law of the Sea will establish, as stated in the Preamble of the Convention, "a legal order for the seas and oceans which would facilitate international communication and promote their peaceful uses, the equitable and efficient utilization of their resources, the study, protection and preservation of the marine environment and the conservation of the living resources thereof." The last decades have shown that a few western industrialized countries alone cannot solve the most pressing problems of the developing world. Keeping the peace is becoming more and more difficult, and even more expensive. Therefore, one simply cannot afford to miss the chance to establish a generally acceptable order for the oceans and the uses of its resources. Those States which have expressed the view that the Convention on the Law of the Sea can serve as a peace-keeping instrument should be challenged and urged to cooperate to such ends.

Finally, I suggest it is important to take a critical but positive view towards the development of the law of the sea. The Third United Nations Conference on the Law of the Sea and the Convention on the Law of the Sea should be regarded as an integral part of the development of international law, which cannot be ignored by any means. The Convention should not be seen as the final act of a drama. It is only an important milestone on a long road before us. For these reasons, we have to make all possible efforts to convert the unsatisfactory aspects of the Convention into opportunities for intensive studies and other activities aiming at cooperation in various fields of ocean development and management. These efforts should include the negotiation of interpretations of provisions of the Convention and the promotion of dispute settlement by peaceful means.

However, I do not suggest an early ratification of the Convention. The Preparatory Commission for the Establishment of the International Sea-Bed Authority and the International Tribunal for the Law of the Sea, to be set up after 50 states have signed the Convention, should be given the opportunity to complete its work with care. Pending the entry into force, the Convention can serve as a framework of political and legal guidelines for implementing a selection of provisions and for bilateral, regional and multilateral agreements and arrangements necessary to meet the immediate requirements of coastal states, ocean users and the international community as a whole. The international organizations and commissions which have functions and competences in the development of the law of the sea, and in ocean development and management, will have the opportunity to apply their expertise to further the goals of the Convention in view of their assigned roles.

Of course, one might argue that such a testing period for the Convention on the Law of the Sea will result in the unravelling of the entire package, as contained in the Convention. This brings me to my final remarks. In my view, it

is not useful to regard that package under any circumstances as the end of a process. Instead, it should be understood that the Preparatory Commission will work out a set of rules, regulations and procedures which could facilitate the ratification of the Convention by a large number of states, including the United States, other major industrialized countries, and the European Economic Community.

JOHN CRAVEN: Our next speaker is Gordon Becker, also well known to our entire community, a former legal counsel for Exxon, and at the present time the chairman of the petroleum subcommittee of the advisory committee to the United States delegation.

GORDON BECKER: I shall try to review briefly the reasons, at least the ostensible reasons, given by the United States through Ambassador Malone, head of the U.S. delegation, for its negative vote. I think this may supplement the fine introduction made by Dr. Platzoeder and serve as a backdrop for the speeches yet to come.

You may recall that Ambassador Malone in his speech explaining the negative vote of the U.S. noted that some modest improvements had been made in the draft treaty text during this session. He may have had in mind such things as the two resolutions which were described to us this morning by Marne Dubs: the resolution on the Preparatory Commission and the resolution on Preliminary Investment Protection. He may have had in mind other improvements which respond to U.S. requests for change, such as the decisions requiring an increase in the majorities required for certain decisions of the Council, the executive arm of the International Seabed Authority. He may have had in mind the provision which in effect guarantees the United States a seat on the Council. He may have had in mind provisions in the changed draft which encourage the timely issuance of regulations for minerals other than nodules upon the demand of parties to the treaty.

But let us go through Ambassador Malone's speech more carefully. This may involve repeating some of the points that have already been mentioned, but that won't do any harm.

You'll recall that the Presidential Statement urged that changes be made in the Draft Convention, so that the development of deep seabed mineral resources would not be deterred and so that national and world demand for these resources could be satisfied. Now Ambassador Malone contended in his speech that, although some improvements had been made in the deep seabed provisions, they were still basically objectionable and would deny the operation of basic economic forces. What did he have in mind?

You must think it's strange that I ask "What did he have in mind?" Don't I know what he had in mind? I'm not sure. Since his speech and subsequent press statements were couched in rather broad, general terms, one has to speculate to a modest degree what was in his mind.

Well, in suggesting that the Draft Convention still was a drag on the development of deep seabed resources, and would interfere with the satisfaction of world and national demand for them, Ambassador Malone had in mind, I think, what Marne Dubs called the imaginary objections of some portions of the U.S. hard mineral industry. I think he had in mind, for example, production controls. I think he had in mind the unchanged provisions of the draft treaty which authorized the International Seabed Authority to enter into commodity agreements that would affect not only production by the Enterprise, the operating arm of the Authority, but also by all other miners in the deep seabed area. But apart from objections, which some might call unimportant, I think he had in mind the failure of the U.S. to get removed from the text a number of provisions which the U.S. claimed discriminated in favor of the Enterprise.

Now the Presidential Statement had asked for changes to grant assured access to deep seabed resources by current and by future mining entities, so as to enhance security of supply of these minerals to our country, to avoid monopolization, and to encourage economic development of the resources. Ambassador Malone, of course, was aware of the two resolutions, one on the Preparatory Commission and the other on PIP, parts of which surely represented substantial advances towards meeting U.S. objectives.

What I think he had in mind, however, was the fact that future mining applicants for a right to mine were not guaranteed access to minerals as proposed by the U.S. You'll recall, for example, that the U.S. and its allies had proposed a system whereby a state which sponsored a particular applicant for a right to mine (application for a plan of work), a state which sponsored a particular miner, could certify that the miner was qualified to receive permission from the International Seabed Authority. This is a rather interesting and sweeping proposal, and would take away, or almost take away, from the Seabed Authority the examination of qualifications and make the certification of the sponsoring state almost tantamount to a final determination that the prospective miner was qualified.

Ambassador Malone, as I have said earlier, undoubtedly had in mind the numerous provisions in the treaty text which do seem to give a competitive edge to the Enterprise at the expense of private miners. Now certainly Malone could take satisfaction with some of the changes I've already mentioned: for example, the one that gave the United States virtually a guaranteed seat on the Council. However, he undoubtedly was disappointed that the efforts of the U.S. to obtain a proportionate voice on the Council for nations which he believed would be most affected by the Authority's decisions were not successful. Although the U.S. was a beneficiary of the change which guaranteed it a seat, the other provisions sought by the U.S. to give Western nations a greater voice on the Council and in Council decisions were not accepted.

Ambassador Malone also must have had in mind the fact that U.S. efforts to increase the decision-making power of the Council, probably at the expense of the Assembly, were not successful. So while the U.S. undoubtedly felt that its power to prevent the Council or the International Seabed Authority from making decisions adverse to U.S. interests had been strengthened, there had not been a corresponding grant of power to the U.S. and its allies to bring about affirmative action in the Council itself as a result of the New York session.

We've heard a lot about the Review Conference, and we know that one point strongly emphasized by the President in his statement of U.S. objectives was the need to prevent the coming into existence of a treaty regime which could be amended without the consent of all of its parties, and especially the U.S. This was a restatement, in a sense, of the doctrine that if X number of parties enter into a contract, X minus two parties should not be permitted to change the contract in such a way as to bind all the original parties. ("I agreed to the original contract. If you want to change it, you've got to get my consent.") The changes made in the Convention did not satisfy this objective.

The U.S. had asked for changes that would avoid the setting of undesirable precedents for other international organizations, that would set aside provisions for the mandatory transfer of technology by private and governmental miners to the Enterprise, and that would displace provisions that might be used to fund national liberation movements. As we all know from this morning's session, Mr. Malone landed especially hard on the transfer of technology provisions. Speaking personally, I find it very difficult to understand how the conferees, with all the ingenuity that was at their disposal, were not able to find a solution to the objectionable transfer of technology provisions.

One can view with concern those provisions of the Convention which can be interpreted as authorizing the International Seabed Authority to grant support and monies to national liberation movements. I think it is an unfortunate error that this is present in the text, in that portion relating to the deep seabed. One must acknowledge, however, that the U.S., if it were a party to the treaty, would be in a position to block a decision, say, to give part of the Authority's monies (if it ever has any money) to organizations like the PLO.

Ambassador Malone must have been concerned that U.S. efforts to enlarge the rights of states to challenge actions of the Authority as beyond its powers, or in violation of its powers, were unsuccessful in bringing about appropriate changes. He must also have been disappointed that efforts to make changes in the draft text that would have prevented the Authority from changing the rules applicable to a particular successful mining applicant, after the application had been granted, were unsuccessful. It does seem reasonable, I suggest, to think that a mining entity which is given permission to mine pursuant to certain rules should not be subject to having the rug pulled out from under it by a drastic change later on.

Mr. Malone also had in mind that the U.S. efforts to insert provisions in the treaty assuring a separation of powers among the organs of the International Seabed Authority (the Council, the Assembly, the Legal and Legislative Commission, the Economic Commission, and other organs) were similarly unavailing. I have already mentioned that he must have been disappointed that the powers of the Council, for example, were not increased to give it primary responsibility in determining the budget of the Enterprise.

Perhaps I should leave this grim litany of points, and wind up with a few bright spots. The improved provisions on PIP, the Preparatory Commission and other matters have already been mentioned. But I have to reveal my parochial attitude with some further, but brief, comments. At long last, and largely through the efforts of the U.K., the provisions which would have required oil companies which have drilling rigs in the exclusive economic zone to remove them completely when they are no longer used, or when they are abandoned, was modified in favor of a somewhat more reasonable standard. Environmentalists among oil companies (and believe me, there are some) tell me that a drilling rig properly cut off, so as to protect navigation, is a wonderful haven for fish and that to try to remove it completely could create many serious environmental hazards.

As you know, the New York session defeated determined efforts to introduce transit provisions that would have required warships to give advance notice to coastal nations before transiting their territorial sea, or even to get consent. The New York session made it clear that national liberation movements could not become parties to the treaty. That is a plus, although organizations like the European Economic Community certainly can get aboard. I look forward, as you do, to the commentaries, criticisms and opinions of the remaining speakers. Thank you very much for your kind attention.

JOHN CRAVEN: We are very fortunate this evening in having on our panel Ambassador Thomas Clingan, who was the vice chairman of the U.S. delegation and is well known to all of us. Probably Ambassador Clingan is in the best position of all to give us some perspectives on the New York meeting.

THOMAS CLINGAN: Let me say, as I must at the outset, that my ruminations in many of the areas that I shall touch upon are purely the product of my own clumsy imagination and they do not necessarily, or even probably, reflect any view of the United States administration.

First, I must lay to rest an impression which, despite the best efforts by the United States delegation in New York this spring, appeared to grow throughout the conference, and lingers on to a surprising extent even today. That is the impression that the United States was not in fact prepared to accept any law of the sea treaty.

In his January 29 public statement, President Reagan clearly stated that the United States was "committed to the

multilateral treaty process." Should the Conference meet the objections set forth in that announcement, he said, "my administration will support ratification." Therefore, I think that any expressions to the contrary, either by members of the public or by members of the Conference, should be immediately laid to rest. It was never the intention of the United States government to do anything other than engage in a serious negotiating process (although I must confess we were not overly hopeful). It was the U.S. government's intention to seek the changes that would be necessary to achieve a law of the sea treaty which all, including the United States, could accept. I think it's important to understand that.

In his January statement, the President outlined six objectives. As has already been said this morning, the specific problems contained in the Draft Convention which had to be addressed and resolved in order to meet the president's objectives and alternative possible solutions were put forward by the United States in a document widely distributed throughout the conference on February 24. This is commonly referred to as the "approaches" paper. But in that paper no specific draft texts were suggested. Subsequently, in response to requests for specificity made by certain influential members of the Group of 77 (as opposed to a formal request from the Group itself), the United States prepared a detailed set of draft amendments which would, if acceptable in the judgement of most people, come close to achieving, if not completely achieving, the President's objectives. The United States clearly stated, at the time when this document was distributed, that the so-called "Green Book" (the book of amendments) should not be viewed as an ultimatum by the United States; but it should be viewed only as indicative of possible textual solutions to issues raised in the previous "approaches" paper. It was, nonetheless, received by the Group of 77 with shock and consternation, and was quickly rejected by them as any basis for further negotiations.

I suppose in retrospect one could say that the atmosphere created by the "Green Book" was so bad that questions could be raised regarding the tactics, timing and mode of presentation of that book. But it is, of course, always easier to judge after the fact than at the time when a decision has to be made.

After the rejection of this document by the Group of 77, the Conference was left without any document which could be agreed upon by both sides as a basis for negotiations. It was into this vacuum that the Group of 11 (the "friends of the conference", or "Good Samaritans") stepped, in the hope of producing a document that could be agreed to by both sides as a basis for further negotiations. For those of you that have been following the Conference, or are familiar with multilateral negotiations in general, you know that it is not possible to discuss issues in a vacuum. One simply has to have some document to which both sides will agree as a starting point. It was the hope of the Group of 11 to provide such a document, since the United States had rejected the existing text, and the Group of 77 had rejected the U.S. changes.

It has been said -- not here, but in other places -- that the United States and their industrialized allies rejected the G.11 proposals, but that is not entirely correct. There was much in the proposals of the Group of 11 that held appeal for the United States and its allies, and it went quite far in the direction of satisfying some of the U.S. objectives. Transfer of technology, for example, was mentioned in that regard this morning. Thus, the industrial allies were willing to accept them as a basis, but not the sole basis, for negotiations, because the Group of 11 paper did not address at all some concerns previously elaborated in the February 24 paper and in the President's statement of objectives. Included in this category, for example, were issues relating to production controls and decision-making in the Council. For their part, the Group of 77 made it absolutely clear that they were unprepared to discuss any issues other than those contained in the Group of 11 paper. It can be said that even the old diplomatic technique of fudging the issue by saying, "Well, let's take the Group of 11 paper and start to talk and see where we go," even that old technique failed, because the response of the Group of 77 was, "Fine, provided that it is clearly understood that we will never discuss with you decision-making in the Council."

Thus it was that with only three weeks remaining in the final session of the Conference, proceedings were deadlocked, with the exception of the completion of the negotiations on issues that had been mentioned by the President as "outstanding issues" -- the so-called three P's (PIP, Prepcom, and participation by national liberation movements) and others. Thus, at that point the work of the Conference with regard to deep seabed mining had been essentially completed. A last-ditch effort by the Conference president, Tommy Koh, to bring the two sides together failed to produce any real negotiations. But, because there was no agreed agenda, these meetings only resembled what we in the U.S. understand as administrative hearings, where each side presents its case and makes its old arguments.

The Conference ended on that note with the adoption, as has been said, of the treaty by an overwhelming majority. Dr. Platzoeder has made some very good comments on the significance of that outcome and I won't repeat them. It's clear to me -- in my own judgement -- that mistakes were made by both sides -- let me emphasize, both.

On the part of the United States (and I don't know whether you can really classify this as a mistake, but it's a fact that led to the ultimate outcome) the rigid instructions to the U.S. delegation did not permit the kind of flexibility that would allow us to find a way to get into truly substantive negotiations on mining issues, or on a reasonable agenda to see where such negotiations might possibly lead. They might have led nowhere, but it was not even possible for us to engage in that operation because of the necessity to have agreement to meet certain objectives.

Second, I suppose, looking back, the distribution of the "Green Book" could be viewed in a certain way as a tactical mistake. Certainly, it is clear that the impact of the package that was presented therein was overwhelming for the Conference. It was difficult, at that early stage, for the Conference to adjust to the magnitude of the changes that were included in that document. I think, therefore, it was viewed by some, and certainly by the Group of 77, as a declarative statement of intent by the United States to reject any reasonable compromise.

Third, there may have been a somewhat incorrect evaluation of the internal workings of the Group of 77, which led the U.S. to treat them more as a homogeneous group than they really were -- as though they had immense internal discipline and were subject to control or persuasion by a few perceived leaders. This perception proved ultimately to be incorrect.

On the part of the Group of 77, I think there was a failure within the Group to believe in the sincerity of the United States' desire to negotiate seriously the changes that had been set forth in the President's objectives. I criticize them, secondly, for a refusal to exercise flexibility in any form with respect to the negotiating agenda. Finally, related to what I said earlier about our own assessment of the Group of 77, I believe in hindsight that they demonstrated a high degree of inability to resolve their own internal disagreements. This led the Group to adhere to the lowest common denominator they could identify, which inevitably became hard line positions.

So for these reasons and others, a last-minute attempt to revive the negotiations with the Group of 11 proposals failed totally. Gordon Becker has commented upon the decision by the United States to force a vote on the proposed text. As an oversimplified explanation, that decision came as a result of the belief of the United States delegation leadership that any other procedure than demanding a vote and casting a negative vote could mislead many delegations about the depth of the United States concern regarding the provisions of the treaty, and about the probable course of future United States action regarding the treaty.

The question now, after the Conference, is, what happens now? Well, on matters of substance, there is, in my judgement, no real prospect that this Administration will sign, or that the United States Senate would give its advice or consent to ratification of the treaty, in anything like its present form. I think there should be no false hope along these lines, although no official decision has yet been made by the Administration in this regard. I'm not here to debate the wisdom of the decision, but merely to state my firm conviction that such a decision will be made. I think I would also lay to rest any real hope that the Administration would agree to further attempts to revive the Group of 11 papers, unless other changes could also be agreed. Even then -- and here I'm referring to other changes that would meet other aspects of the president's objectives -- even then, I regretfully say, the prospect is too dim, in my judgement, to warrant encouragement. But again, that's my personal opinion.

There are certain procedural questions that still need to be answered, even given that perspective. Should the United States continue in its role in the forthcoming session of the Drafting Committee? Should it sign the Final Act? Should it participate in any form or manner in the work of the Preparatory Commission?

There's a very strong view in certain sectors in Washington that the United States should do none of these; that it should, instead, completely disassociate itself from the treaty in all its aspects. This view favors, in lieu of a treaty, the Reciprocating States Agreement mentioned earlier today, and warns against any steps taken by the United States, such as those that I have mentioned, which discourage completion of that Agreement, and thus encourage our industrial allies, perhaps because of signals that they might misperceive, not to join us in refusing to sign the treaty.

Those taking the opposite view see advantages in further U.S. involvement without sacrifice of substance. Under this view, further United States work in the Drafting Committee could be a useful undertaking. While the treaty, should it come into force, may not be legally binding upon the United States, the argument goes, it is still a legal document and it will have to be contended with as a fact. Thus, as the argument goes, it is desirable to have its provisions as clear, consistent, and well drafted as possible, and desirable that the United States should assist greatly in this endeavor, as it has in the past.

Signing the Final Act, of course, has no legal significance. It simply verifies that this is the text that was in fact approved by the Conference and indicates that the signing delegation was there. But failure to sign the Final Act, it is argued, has certain consequences. First, it deprives the state that does not sign of the important opportunity to make critical interpretative statements on the record of the Conference. This loss cannot adequately be made up by relying on surrogates who might make similar statements. Second, it deprives that state of the ability to assume observer status at the Preparation Commission, where rules, regulations, and procedures implementing or supplementing the Convention will be developed. If time permitted, the drawbacks of this could be elaborated; but I think they're so obvious that I can pass over them here. Finally, it is argued, failure of the United States to appear and sign the Final Act would be an act of international discourtesy to all the delegations who labored long in the process, and would thus invite serious critical public statements against it and generate bitterness regarding the global position of the United States and its credibility in world affairs. While I list this as an argument in favor of signing the Final Act, it is by no means viewed necessarily as such in certain circles in Washington or by the U.S. public in general. In other words, the concern, at least as it is raised by those who make these arguments, is that United States withdrawal from this particular process holds a portent for broader impacts upon the international community; and that the international community should therefore be appropriately forewarned.

Others on this panel will probably comment on the critical questions concerning reliance by nonsignatories on customary international law. I'll simply state, very briefly, that one argument made is that states not a signatory to the Convention can "pick and choose," rely upon certain portions of the treaty that it desires to rely upon as customary international law, and reject others. The other side of the argument is that no state can claim benefits under the treaty without accepting the obligations of the treaty. Now, these are tough questions. I will just say that in my judgement, neither of these arguments is entirely valid. But I'll leave this to others present, who may wish to go into it in further detail.

JOHN CRAVEN: Our next speaker is Professor Edward Miles, Director of the Institute for Marine Studies, University of Washington. So we have come to know him in one more new capacity. Those of you who heard him this morning know that he will certainly have some insightful comments this evening.

EDWARD MILES: Thank you, John. I should preface what I'm going to say by two remarks. First, I arrived here last night exhausted and defenseless from a very complicated red-eye flight and was ordered by John Craven to appear on this panel tonight and tell you what I think. I had not expected to be asked to do this, but I will tell you what I think. Some of you will find what I have to say about U.S. performance at the 11th session harsh. It may be harsh, but I think it's fair, and I am prepared to substantiate this point of view in the discussion, if you wish. Second, I also want to emphasize that nothing I do say about the United States should be taken as implying substantive criticism of Tom Clingan or Bernie Oxman, since I assume that they do not write their own instructions.

(Laughter)

I must confess that during the latter part of the 11th session I sat and watched the United States delegation with increasing puzzlement and alarm. It seemed to me that the Conference leadership had taken, with great personal courage and considerable risk, a major step in seeking to get both sides, and in particular the Group of 77, to accept the PIP resolution as a means of getting out of the thicket of the "Green Book." I also think the "Green Book" was a colossal tactical mistake.

Now the PIP resolution is in my view a brilliant tactical maneuver to defer the major, very difficult, very contentious issues until a much later time. The general expectation was that those issues would be deferred for at least the entire interim period: i.e., the first generation of seabed mining. In doing so, they gave the United States and U.S. miners guaranteed access to the area and the opportunity to mine. The production controls issues (I agree with what Marne Dubs said this morning), were much more imaginary than real.

Now, in addition to all the fuss over Committee I, something extremely important happened with respect to Committee II. In the Plenary, more than 80 states in effect made a challenge on an issue that the United States considered of vital

importance. More than 80 states asked for revision of the Convention in respect of prior notification for passage of warships through the exclusive economic zone. These states, at the end of the meeting, were told by the President that they were not enough; that the Convention would not be changed because the cost of changing the Convention in that direction would make it absolutely impossible for the United States to sign the Convention. The sum total of those improvements, (i.e. the changes in the Committee I text plus the refusal to change the Committee II text) were really almost more than the Group of 77 could accept.

It sometimes surprises me to hear the way in which American diplomats refer to negotiations in the United Nations and to the reception given their own proposals. They speak with surprise that everything they ask for in negotiations is not given to them. The President of the United States said there were six areas in which they would have to get improvement. The Group of 11 made Herculean efforts to go even beyond the PIP resolution. The United States delegation said this was not enough.

But if you look at the other side, the Group of 77, it was never clear that even the PIP resolution would be acceptable to the Group until noontime on the last day of the Conference (April 30th). The Group of 77 is a very difficult phenomenon in which to work and in which to negotiate problems of great complexity and substantive importance. The fact that the compromises that were made withstood challenge in the Group of 77 should not lead you to assume that they did so easily. It is, therefore, with astonishment that I continue to hear U.S. diplomats complain that the Conference did not accept everything demanded by the President of the United States.

So this suggested to me, sitting in New York at the back of the room, that there were only three possible explanations for the behavior of the U.S. delegation. I can deal with two. I really can't deal with the third, and I'll explain why in a moment. The first possible explanation is that the U.S. delegation felt that seabed issues left outstanding, those that Gordon Becker so nicely summarized, were so crucial to United States interests as to outweigh all other gains the United States made in the Convention. Alternatively, one could argue -- and this in effect was the lasting result of the "Green Book" maneuver -- that the United States was in fact playing a very cynical game: one in which they sought to get the most improvements they could, to retain the parts of the Convention they liked by way of state practice and assumed customary law, and reject the rest. Rejection would mean that they would not have to pay the costs of what they did not like, which, in effect, was the seabed regime. The "Green Book" called into question U.S. motives and raised considerable ambiguity in the minds of the Group of 77 as to what the United States was about. The assumption was, at least in some quarters, that the U.S. was seeking simply to prolong the negotiations by several years. This, in turn, reinforced the intention in other quarters to conclude the negotiations as originally scheduled.

These two alternative explanations I can and will assess. There's a third possibility. One might call this analytic and diplomatic bungling, in the words of Ambassador Jeanne Kirkpatrick. That is, since the spectacular housecleaning of March, 1981, the new U.S. team did not in fact understand what U.S. substantive interests were in the Law of the Sea Conference and lacked the diplomatic skill to realize them. Since I'm not part of the U.S. delegation, I am unable to assess the extent to which this possible explanation may or may not be true. But I confess that, on occasion, as I have watched their behavior, I have harbored unkind thoughts.

(Laughter)

Most recently, the three occasions that bring this to mind are the historic General Committee meeting in the spring of 1981 over the Program of Work of the resumed 10th session. Believe me, that was spectacular. Then the "Green Book." And third, the demand -- not the request -- the demand of the U.S. delegation that there be a vote on the adoption of the Convention irrespective of requests from friends, allies, and enemies that this not take place. But, as I say, those just stimulated my unkind thoughts.

Now to assess the first argument: was the residue of seabed mining issues which the United States did not succeed in getting changed so crucial as to justify the rejection of the whole treaty? What is at stake for the United States in the treaty? Its first priority, I think, has been maintaining relative stability on the nature of the ocean regime and the components of that regime: stability which comes from the large scale international acceptance of that treaty. In fact Under-Secretary-General Zuleta had quite a bit to say about this point this morning. The treaty, let us not forget, contains very significant innovations on the protection of navigation, which the United States delegation for years went around telling the Conference was the prime objective of the United States in the negotiations. Now, we ought to recognize that customary law is not an acceptable substitute for securing transit passage and archipelagic sea lanes passage and for settling the host of attendant issues that arise in moving from a three-mile to a twelve-mile territorial sea, and the straits provisions are unlikely to be secured without a treaty. If the straits provisions are not secured without the treaty, then overflight is not secured.

Second, the United States makes very large gains, in fact indecently large gains, in control over living and nonliving resources. The United States is one of the biggest winners in this business. But let us also point out that these gains are unlikely to be affected whether or not a treaty comes into force.

Third, there is for the United States an acceptable balance between controls over ship generated pollution versus protection of navigation; and the United States does have a considerable security interest in the protection of large-scale tanker movement. These, allow me to point out, are unlikely to be secured without a treaty, because there are very significant

movements within the developed world -- in France and the United States in particular -- which would like to overturn that balance, thereby putting much greater controls on the navigation of tanker traffic.

Fourth, the United States gets a parallel system in the seabed regime and guaranteed access for miners to the international seabed area.

What does the United States pay for these gains? In the first place, U.S. tuna fishermen face a very difficult future. It is fair to say that very few countries agree with the U.S. position on tuna. Therefore, whether or not there is a treaty, the interests of U.S. tuna fisherman are likely to remain in jeopardy. In fact, the only significant safeguard the U.S. tuna industry has is the embargo provision in the FCMA, the Magnusson Fisheries Conservation and Management Act, because in the tuna business there are only two major players, the United States and Japan with Europe third but not as large as the first two. However, the market is divided. The Japanese market is primarily a sashimi market. The U.S. market is the canned market. In fact, the U.S. market drives the Japanese market for skipjack. That is the only protection, and it's a very significant protection, that the American Tunaboat Association has; but this remains at the moment anyway without a treaty.

Now another cost is that there are adverse impacts for university-based distant-water oceanographers. Military oceanographers are not touched by this treaty. Only the university-based distant-water oceanographers are touched by it, and in ways that are onerous. But the fact is the future will be worse for them without a treaty, because university-based distant-water oceanographers will be held hostage by both those states in whose zones they wish to apply for access and the U.S. government, which does not wish to recognize those zones, and they will not be able to find an acceptable way of doing so.

Third, the financial arrangements governing seabed mining are costs. There are two parts to this. The financial terms of contracts which, as Marne Dubs pointed out this morning, really won't be a problem, if the U.S. Treasury would agree not to insist on double national and international taxation. The other part to that is the financing of the Enterprise, which one would have to count as a financial cost.

The fourth cost is the technology transfer provisions in Annex III. In my view, those are more apparent than real, but the U.S. government made a big issue of that, and so we leave it.

I will not count production controls, nor will I count decision-making in the Council. I will leave the Review Conference to Bernie Oxman; I wish only to say there is much less here than meets the eye.

How then to weigh the costs versus the gains? The U.S., to recapitulate, has secured its major objectives in the Conference established prior to 1974 and carried through several Democratic and Republican administrations. These gains cannot be secured without a treaty. The U.S. has secured its interests in

resources, though for a long time it denied those interests. Whether or not there is a treaty is not much help to U.S. tuna fishermen, and a no-treaty scenario is worse for university distant-water oceanographers.

So what, then, are the remaining costs? The financial arrangements, or one part of it, for the seabed regime, and technology transfer. It is really difficult for me to see how these two remaining issues, or even these two plus the Review Conference and decision-making in the Council, are worth rejection of the whole thing. But, of course, I come from that crazy Seattle group.

Now, how about the tactical question that I raised? Is this a move by the United States to get what it likes and to reject what it doesn't like? Well, this really ties in with the bungling argument, you know. I don't really know if some people in the U.S. government think like this. I suspect that may be the case. But if it is, it would be seriously mistaken, because, as I've argued, it is not possible to secure what the United States likes (what it likes most) without a treaty.

Furthermore, if this were the intent, the rejection of the treaty will in my view lead to considerable complication of U.S. foreign relations. It will invite the game of "linkage politics" on the part of the Group of 77 and the Soviet Union, and in my view the Soviets and the Eastern Europeans will sign this treaty. The temptation for "linking" accession to the treaty by the United States, by holding hostage a variety of other unrelated issues in which the United States is interested, will be too great to resist.

Second, the rejection splits the Western Alliance. France and Japan voted for the treaty. In my view, more of the Westerners will sign this treaty. That will leave the U.S. not necessarily isolated, but lonely. Now, when one raises this issue in private with people from Washington, the response is, "Yes, they may sign but will they ratify it?", as if this is a big protection necessarily. We are back to the bungling argument again.

One could also say that rejection of the treaty will not lead, for the United States, to resolution of the question of title to mine the resources of the international seabed area because, since the Western Alliance is split, it will be extremely difficult, if not impossible, to have a Reciprocating States Regime by itself. So what are we left with?

One is led to the conclusion inexorably that ideology of a certain kind, some of which we heard this morning, is now the determining ingredient in U.S. foreign relations and that everything the United States does in the international system must meet the criteria imposed by this ideological test, and that the United States is willing to insist on ideology irrespective of substantive gains or losses made on the issue at hand. If this is the case -- and I would be delighted to be proved wrong -- then I fear for the implications for the nature of the current international system of the adoption of this strategy by U.S. diplomacy. I fear that the costs of maintaining such a stance in the future will be great, not only

for the United States but for the rest of the world, because, willy-nilly, what the United States does affects quite a lot of people in the world.

JOHN CRAVEN: Thank you very much. You have certainly blown your cover and revealed you are not a member of the U.S. delegation. [Laughter]. Our wind-up speaker in this panoply of balanced perspectives on the New York meeting is Professor Bernard Oxman, who is a senior adviser to the law of the sea delegation and has been for many years an active participant with the delegation and with the Drafting Committee of the United Nations Conference on the Law of the Sea.

BERNARD OXMAN: Let me deal first with the issue adverted to by Ambassador Clingan and discussed by Ambassador Zuleta this morning. As we all know, when you make decisions in the real world, you are never choosing between what is presented to you and what would be absolutely desirable in Heaven, but rather between real alternatives. We learn, as we grow up, that most of the choices we have to make are between alternatives that have undesirable features attached to them. Therefore, as we proceed into the treaty/no treaty debate, we have to look at the real alternatives that face us. Those real alternatives are written law and unwritten law.

I at least interpret Ambassador Clingan's prediction that this Administration would not sign the treaty and that the Senate would not ratify the treaty as a short-term prediction. I certainly think it is critical that the public debate on this subject be continued for as long as it takes -- two years, four years, six years. I think there is a great deal of consistency in fact between Ambassador Clingan's discussion of what went on and Ed Miles' discussion. I have no doubt whatsoever that President Reagan's instructions to Ambassador Malone were exactly as Ambassador Clingan stated. I also have no doubt whatsoever that there were those in government, including possibly employees of Ambassador Malone, who never did agree with the decision reached by President Reagan to continue in the Conference and to work towards a successful conclusion. The United States government, like any other large organization of people, is not a monolith. It is, nevertheless, an organization that, at least in theory, carries out the decisions of its President once they are made.

The first point to be made is that the law is an absolutely neutral tool. It can be used for good, and it can be used for evil. It is inherently neither.

The question we have to ask ourselves when we talk about the law of the sea is, what do we want from the law of the sea? Now aside from specific policy goals, when we ask what we want from law, we give two classic jurisprudential answers. One is that we want to discourage the resort to violence, and the other is that we want to increase order and predictability. Basically, what law represents is an agreement on the part of each of us to restrain ourselves, because we want others to restrain themselves.

I think we should use this as a yardstick to deal with the various issues raised by Ambassador Zuleta this morning. Specifically, at this point I want to exclude the notion of law as simply a piece of rhetoric, which you use to deliver pleasing speeches to your own constituents and colleagues who already agree with you. That is not law. The test for law is that it has to be something that will discourage resort to violence and tend to increase order and predictability. It must say something about the way other people behave, not just the way you behave.

Now the important question that arises in this treaty versus customary law debate is, why ratify any law-making treaty? All such treaties state in the preamble, one way or another, that they are announcing the law on the subject for the world. If that is the case, you take what you like as customary law. Even if you are not a party, you have all of those rights and duties implicitly, because the text is representative of customary international law binding on all nations. Then you consign what you don't like to the status of mere contract. That is, what you don't like is only binding among the parties to the contract, if any, and is not binding on you.

With a large and complex treaty like the Law of the Sea Convention, this is a very complicated dilemma. Dr. Platzoeder, for example, expressed great skepticism about the customary law status and indeed about the desirability of enhancing the customary law status of the Convention, when she spoke to you earlier, because she was addressing the issue of deep seabed mining. I would venture to guess that if Dr. Platzoeder were talking to you about the issue of straits, she would have expressed somewhat different opinions regarding the customary law status of exactly the same document.

The underlying problem here is that one man's quid is another man's quo. This raises the difficulty of fairness. If you go into a bargain, you get things in exchange for something you give. You cannot come around later and say, "What I got is law and what I gave you is mere contract, and I'm not signing the contract." Not only is this unfair, it is ineffective, if the objective is law-making, because the entire thing unravels as the quids and quos get separated from each other.

Let me give you an example, and it will be a controversial example. The 200-mile limit has been referred to in almost biblical terms by participants in this Conference. I would like to know what rule of customary international law says that coastal states' interests in the deep ocean floor beyond the continental margin extend up to, but no further than, 200 nautical miles from the coast. If the treaty is the source of that rule of customary international law, some people might ask, why is the 200-mile rule in the treaty a legal restraint on action beyond 200 miles, while the regime in the treaty regarding action beyond 200 miles is not such a legal restraint? Surely, if European states are free to select a high seas alternative to the treaty regime for Pacific nodules, some people may argue, why aren't the Pacific coastal states at least equally free to select a coastal or regional alternative to the

treaty regime? I really would like to know whether those with ideological objections to the deep seabed mining regime, as set forth in the treaty, would seriously expect that coastal states such as Mexico, Ecuador, Peru, and France, if they controlled those areas, would base their mining laws on Chicago School economic models.

Another example can be given of the *quid* and *quo* problem. Both coastal states and maritime nations each agreed to less protection than they wanted on the question of balancing environmental and navigation rights, on the condition that each one had the right to sue the other for breaching its duties. This balance is in fact the central issue in deciding whether both freedom of navigation and the marine environment can be protected in the exclusive economic zone. If there is no treaty, there is no right to third party dispute settlement. If there is no compulsory dispute settlement, then some may ask why should either side (the coastal states or the maritime nations) respect the concessions they made in exchange for a right to sue?

But going beyond the problem of "picking and choosing," there is another problem in the statement that we can rely on customary international law. There are certain things that simply cannot be achieved readily by relying on customary international law processes. Let me give a few examples, and I start deliberately with an issue which is of considerable importance in this part of Canada. It is said that no one can exploit the continental rise without coastal state cooperation. The coastal state has entrenched rights to its continental margin, whether or not there is a treaty guaranteeing these rights. The first problem I see -- and some of you may think about it in the context of the South Atlantic -- is that even if that statement is true, there remains the question of identifying the coastal state with these rights. But putting that question aside, no one has reflected on whether the opposite may also be true. It may be that the coastal state is in a position to stop anyone else from exploiting the outer reaches of the continental rise without its cooperation, but can it not also be that others, for various nefarious motives, may cast doubt on whether a particular area of the continental rise is within coastal state jurisdiction? That doubt may not be enough to permit exploitation by others, but it may certainly be enough to deter highly speculative investment under coastal state laws in an area which is far from the shore and will be expensive to develop.

It is frequently forgotten in Canada, as in the United States, that even without an International Seabed Authority there will always be someone who prefers not to deal with the coastal state, or prefers to pressure it into a better bargain, or prefers to deter production altogether. Complete security of tenure to the frontier areas of the continental rise can only be delivered by the mining agencies of the coastal state, if that coastal state has agreement in advance on the precise limits of its jurisdiction in those areas.

Second, I'd like to advert to the example of scientific research. You can certainly establish coastal state control over marine scientific research through customary law processes. Scientific research vessels of universities are not going to travel escorted, nor do they want to travel escorted. But through customary international law, you cannot get a usable rule that silence of the coastal state means consent without a written agreement in principle that that is what it means and without a written agreement on the terms. In other words, under the treaty you can get a rule of implied consent, if nothing is said. You cannot get that under customary law.

Let's turn to another example, the duty of full utilization of fisheries. It would be exceedingly difficult, indeed in my personal view probably impossible, to develop a duty of optimum utilization of fish stocks through the processes of customary international law. Indeed, that rule was written into the treaty, because all the coastal states knew that they were under immense domestic pressure not to optimally utilize the fish stocks. In effect the treaty provision is as much a protection of the coastal state against its own internal political processes as it is a protection of distant water fishing states. But let's go beyond that to the issue of principle. The duty of full utilization says, for the first time in an international treaty, "living resources must be reasonably exploited to meet world demand." I find it astounding that not one of the consumer-oriented economists that are fretting over the ideology of manganese nodule mining ever noticed that this revolutionary new principle regarding living resources is contained in the text.

We could turn to the issue of environmental law. I think everyone who's been engaged in international environmental negotiations would agree that the provisions in the treaty on environmental protection may well be the most significant stride in the history of international environmental law since the movement began. It would be difficult, indeed in my view impossible, to negotiate and get ratified the environmental provisions of the Convention as a separate treaty. I think you also have to recognize that it would be exceedingly difficult to move those principles into customary international law, because customary international law simply cannot easily supply the detailed safeguards and technical qualifications that were necessary to make the broad principle acceptable.

Let's turn to another issue, that of title to deep seabed minerals. I personally have often wondered why title to deep seabed minerals is necessary for exploitation to occur, but everybody keeps assuring me that it is. If title is what you need, then I think any lawyer will tell you that title is a right not against specific people, but a right against any challenger. Now, even by that definition you can acquire title through processes of customary international law. But you cannot make the customary international law that gives you title unless those who disagree are prepared to acquiesce.

Next, one might look at the whole problem of specialized exceptions, and the treaty is rife with them. Customary

International law is a very blunt instrument. It tends to abhor specialized exceptions, unless, for example, there is a local custom that is positively accepted by the state against whom you are complaining. I'm sure Ambassador Zuleta has had occasion to look carefully at the case which establishes that principle. Thus, just to cite some examples of concern to North America, the special exceptions in the treaty for ice-covered areas, for anadromous species, and for highly migratory species, may be more difficult to impress upon the corpus of customary international law.

Having recounted all of this, I think we have to consider that the greatest loss in comparing a treaty with customary international law would be that you cannot have procedures for compulsory settlement of disputes resulting in a binding decision without a written agreement accepting jurisdiction. We have to face the fact that states, like people, will always make claims on each other. One key to discouraging resort to violence in order to vindicate those claims is to provide an alternative, if all else fails. One of the most important functions of requiring a defendant to accept the judgment of a court of law is not to control the defendant, but to discourage resort to violence by the plaintiff.

The loss of compulsory dispute settlement will also greatly effect the efficacy of both the navigational and environmental provisions that are much touted in the text, because both of them currently are amenable to compulsory process. In particular, if courts of law do not develop the new complex law based on the balance between coastal and navigational rights in the economic zone, who will? I do not see the United States leading the charge to protect navigation from coastal state erosion, not only because it might lack the ability or will, but especially because I see the United States in the forefront of those making claims in its own economic zone that erode those very freedoms. The United States has never developed an effective internal mechanism to protect its own navigational interests from its own coastal state claims. In that regard, a system of compulsory third party dispute settlement, in a very odd way, can be seen as a different kind of attempt to bring some rationality to the internal decision-making process.

I would also note, in weighing the issue of customary law versus written law, that private industry, unlike government, is required to be cost effective to function. We have to recognize that legitimacy is not only cheaper than force, but it is essential if government control is to be kept at a minimum. The environment of customary international law is grounded on the threats and violence of governments; and that is simply not an environment that is optimally conducive to private enterprise and private investment. I think we should all consider whether it is mere accident that the spectacular growth of written international law, such as the Law of the Sea Convention, parallels the spectacular growth of capitalism.

I raise the issues in part now, because I think that in the interim when you hear arguments to the effect of "let's rely on customary international laws and alternatives" -- and there may

be certain benefits -- I would hope you would at least ask two questions. First, can customary international law achieve the ends we want law to achieve in this particular case? Second, what are the costs of relying on customary international law? It is not a cost-free exercise.

I will go on with two more points since they were adverted to. First, the provision on national liberation movements. If the United States becomes a party to the treaty, it will have a position on the Council of the Seabed Authority to prevent all distribution of benefits to the PLO. That was the negotiated compromise, and was understood by the Arab states at the time. I would note, by the way, that most of the Arab states certainly would hope that by the time the Law of the Sea Treaty entered into force the Palestine Liberation Organization will no longer be a liberation organization in any event, which was also part of the underlying motivation on that issue. But it is a highly emotional, fake issue, which is masking a real debate.

Second, the Review Conference. This issue seems to have produced an extraordinary amount of misunderstanding on both sides. On the domestic side, it should be clear to anyone who looks at the decisions of the U.S. Supreme Court that there is no constitutional impediment to the Senate of the United States deciding to ratify a treaty which contains a clause in it such as Article 155. The power to delegate decisions to the President in the field of foreign affairs was discussed and decided a long time ago in the Curtis Wright case, and none of the things said in the recent Ague and Damson Moore cases in any way alter the power to delegate decision-making authority to the President in the foreign affairs field. Concerns expressed regarding the Curtis Wright case focus on dictum which tended to speak of inherent powers of the President to act alone. I really think that an argument that we need not consider the treaty because it is unconstitutional really ought to be put to one side.

Second, however, a majority of other states including the United States' Western European allies fail to understand the political significance of the constitutional issue, because their own governments are organized differently. Interestingly enough, the Latin American states understood it and I am deeply disappointed, because they have constitutions that are similar to ours, that a better result was not worked out for that very reason.

The problem is that the Senate may well choose not to delegate to the President the authority to keep the United States in a treaty, which has been changed over the objections of the Senate, which in effect would be the result under the Review Conference. It may refuse to do so as a matter of constitutional principle, even though it would have the legal right to do so. Surely you can conceive of situations where you would not delegate a power, even though you had the right to do so. In my opinion, that remains a serious constitutional problem of a political dimension, not so much of a legal dimension. I am indeed disappointed that nothing more was done about it. I do think, however, that lawyers who wanted to find

a solution for the United States to the current text that would solve the internal political dilemma could easily do so. It is not an insoluble problem to protect the prerogatives of the Senate in this case. It's a question of whether you want to do so, or you don't want to do so.

Next, I will cite disturbing evidence of the length that some people in government seem to be prepared to go to in order to denigrate this treaty. As some of you appreciate, it was considered important to achieve in the treaty a very positive article on the protection of whales and marine mammals in order to bring on board the lobby in favor of this treaty, a very active group both in the United States and in a lot of other countries. Ambassador Clingan undertook that negotiation. There is no doubt whatsoever that he had successfully completed it, in the opinion of American and foreign whale groups. Five weeks ago I received a phone call from a local "Save the Whale" group saying that a State Department official in Washington had informed the organization that entry into force of the Law of the Sea Treaty would impede the State Department's efforts to protect whales, because the United States had had to make concessions to Canada that destroyed the efficacy of the article.

I think that there are certainly sound arguments that could be made against acceptance of the Law of the Sea Treaty. But I also think it is important that we insist that this debate be kept somewhat within the confines of rational discourse and rational debate. I suppose that debate in fact will go on for a long time, and I would hope that somehow the Law of the Sea Institute and the Dalhousie group could broaden the scope of it. The choice is not an easy one, and I am not for a moment suggesting that one can very lightly decide to swallow some of the bitter pills contained in the Law of the Sea Convention. Like Marne Dubs, I would not have written it this way. The economic zone would have been high seas. There would have been freedom of scientific research, and so on and so forth. Nevertheless, I think it is important that the real issues in that choice be addressed.

JOHN CRAVEN: Thank you very much. This has been such a superb session, that I know many of you here would like to raise some questions and have some discussion from the floor. Unfortunately the hour is too late. I will look for a consensus from the floor that we call this meeting adjourned for this evening with the full recognition that all of the participants will be around for the remainder of the conference and that you are encouraged to catch them in the hall. Do I have consensus in that regard? I do. Thank you very much.

(Laughter and Applause)

PART IV

SHIPPING:
THE POLITICS AND ECONOMICS OF REGULATION

INTRODUCTORY REMARKS

Panel Chairman William Tetley
Faculty of Law
McGill University

Our panel today, as you know, deals with the top of the ocean rather than the bottom. We are dealing with shipping and the ships that ply the sea. In discussing the regulation of shipping, we are dealing with a problem that is actually with us, unlike yesterday's topic of deep ocean mining, which lies in the future. Should we have had regulated shipping before now? Is the regulation which we have too severe? These are problems of today, yesterday, and the future.

We have an excellent panel. Our first speaker will be Bernhard Abrahamsson, who was born in Stockholm and is a master mariner as well as a Ph.D. from the University of Wisconsin in economics. He is now Dean of the Graduate School of International Studies at the University of Denver.

Our second speaker will be Mario Valenzuela. He was born in Chile, and he is now living in London. He is a graduate of the Universities of Chile, Princeton, and Oxford. He has taught; he has been an adviser to the foreign ministry of his country; and now, since 1975, he works with the legal division of IMO in London.

The third paper is by Mike Shah, Chief of UNCTAD's Maritime Legislation Office, and Barrister-at-Law, Gray's Inn, London. Unfortunately Mr. Shah was required to attend a special Council meeting which conflicts with the Conference, but Professor Gold has kindly agreed to present his paper to us this morning.

The fourth speaker, Don Murphy, is a native Haligonian, which distinguishes him from all the other speakers here today. After graduating from Dalhousie Law School, he joined the firm of Dally, Ritchie, Black and Moreira before moving to Calgary to practice admiralty law with the Canadian Pacific. In more recent years he has been senior counsel with the Canadian Transport Commission. Mr. Murphy will give us a Canadian perspective on the topic of shipping regulation.

Last, but certainly not least, of our speakers this morning is Frank Wiswall. Allegedly he was born in Albany, New York, but I never knew anybody who was really born there. (I always thought they got elected to Albany.) He is a Doctor of Law from Cornell and a Doctor of Philosophy from Cambridge. Like Professors Abrahamsson and Gold, he is a master mariner. In recent years he has been chairman of the Legal Committee of IMO. (They've dropped the "Consultative" out of IMCO. They're just going to be pure regulators, I guess, which bodes ill for us but may speed things up.)

ECONOMICS OF REGULATION IN SHIPPING

Bernhard J. Abrahamsson
Graduate School of
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University of Denver

INTRODUCTION

Ten years ago, a paper on the economics of regulation in shipping would have dealt with liner shipping only, and would have focused on the well known issues of the century-old conference system. In the last ten years, however, the world of shipping has seen the emergence of a new type of regulation: social regulation.

The difference between economic and social regulation is substantial. Essentially, the former impacts on liner shipping only, while the latter impacts on all shipping. The philosophies underlying the two types of regulation are different. While both philosophies are social in the sense that they aim at the maximization of human welfare, the need for optimum resource allocation drives economic regulation, and explicit concerns for health and environmental protection drive the social regulation.

ECONOMIC REGULATION

The economic market for shipping has many facets. In some trades, and at some times, it is very monopolistic; in other trades, at other times, it is very competitive. In general, we assume closed liner conferences to be in the monopolistic range of the spectrum, while open conferences together with independent and tramp operators are at the other end of the scale.

Historically, transportation has tended toward monopoly, and with the conference system, liner shipping appeared to be following this trend. There has always been a great deal of controversy connected with the conference system. Conferences are often referred to as monopolies, but a more appropriate term is oligopolies, because their behavior must always allow for the possibility of outside competition if freight rates are too high. However, the potential monopoly power is a concern that has been with us from the very beginning of the system. Professor Marx, in his classic study of conferences [1], mentions a British Blue Book of 1897 that complains about differential rates injuring British trade. Regardless of the originally defensive reasons for forming conferences to prevent ruinous competition, the increased complaints raised the question of the abuse of monopoly power. The argument was that if conferences were strong enough to prevent rates from falling in a slump, then they were probably also strong enough to take advantage of a boom.

In 1902 the first official investigation into conferences took place when the Straits Settlements appointed a commission to investigate the effects of the conferences on the trade of the colony. The findings were that secret rebates and substantial rate increases had occurred since the conferences began operating. Several investigations followed, the most important of which were the Royal Commission on Shipping Rings (1906) in England and the Alexander Committee (1912) in the United States. The findings of the two groups were essentially the same: the conferences exhibited monopoly characteristics, but were nevertheless accepted as useful institutions because there were competitive elements as well; the power of conferences was limited by outside competition from tramps and new lines. Within the conferences, there was competition to provide better services and facilities. The British commission, however, recommended collective bargaining between associations of shippers (as representatives for the whole trade) and the conferences as a means of counteracting the latter's monopoly power. The U.S. committee, on the other hand, stressed governmental regulations. Later investigations in both countries reaffirmed their respective approaches to conferences: regulation in the United States and shippers' councils in the United Kingdom [2]. The basic arguments in favor of conferences are that they provide regular, reliable service with stable rates. The main arguments against them are abuse of monopoly power with misallocation of resources, excess capacity with unnecessarily high freight rates, and, particularly, price discrimination.

While all official investigations have found elements of monopoly in the system, most have also found sufficient competition, potential or real, to counteract possible abuses. UNCTAD, which represents the interests of the less-developed countries, has for the most part accepted these conclusions in favor of the conference system [3] as well as the approach of relying on shippers' council.

Nevertheless, there has been mounting criticism of the conference system in recent years and more studies have flown from both official and academic sources [4]. Some findings are for the system, others against. The most recent studies in both the United States and Canada call for the abandoning of conferences [5]. The U.S. study has been extensively criticized [6], but is likely to have some impact on U.S. shipping policies.

On balance, we have regulation of conference practices in the United States and, to a minor extent, in Canadian trades. Closed conferences with consultations by shippers' councils is the rule in other trades. In the traditional maritime nations, the Committee of European and Japanese National Shipowners' Associations (CENSA) and the European Shippers' Council (ESC) attempted to set a framework for consultations in a Note of Understanding in 1963. This was followed in 1971 by a Code of Conference Conduct, intended particularly to meet the demands of the LDCs. However, the following year UNCTAD issued its own

code, which was accepted as an international convention in April 1974, and will undoubtedly soon enter into force. The Convention calls for a system of international control of shipping based on the acceptance of closed conferences and the principles that:

1. Governments will have a major role in all relations between shippers and shipowners.
2. Admission to conferences should include noncommercial criteria, one of which should be the development of national shipping lines.
3. Flag discrimination to aid national shipping is accepted in principle, the guideline being for trading partners to carry 40 percent each with the remainder left for cross traders. This is the so-called 40-40-20 rule. (It is interesting to note that the 40-40-20 rule is not entirely new; it has been practised for several years in the U.S.-Brazil trade.)

Although the Code accepts the conference system, indeed, seems to favor it, there are questions about the future. Official investigations into conferences have, in the past, concluded that there are several forces preventing conferences from assuming and abusing monopoly power. These forces were: competition between conferences; real or potential competition from tramps and independents; large conference membership, making collusion difficult and adding a competitive element within the conference; counterbalancing shippers' councils; and threat of national legislation and national fleets. However, most of these countervailing forces have disappeared or weakened. To the extent that superconferences and interconference agreements exist, they reduce the power of competition between conferences. Technological progress resulting in differentiation between tramp and liner services removes much of both real and potential competition from tramps. The formation of international container consortia and the high capital barrier to entry into this trade reduce the threat from independents, although to some extent, the capital barrier is mitigated by the development of companies leasing containerships and equipment. In addition, shippers' councils appear to have relied on government support for effective bargaining: for example, in India and Australia. The final outcome is that non-market regulation of conferences is the only remaining counterforce and the UNCTAD Code is providing that element. It is clear that international liner shipping is moving toward some form of national or international regulation based on bilateral agreements and cargo sharing, and a much more political environment than in the past.

Any form of cargo sharing requires a mechanism to steer the appropriate cargo to the appropriate ship. Many ingenious cargo steering schemes have been devised in the past, ranging from complex foreign exchange allocations to explicit legal flag requirements. Under the Code, however, the conference system

becomes the cargo-steering mechanism. The liners of the trading partners will belong to the appropriate conferences. The only measure that is then needed is to steer the cargo to the conferences, which is easier and more acceptable than direct flag discrimination. Since the proper share of revenue rather than cargo volume is the objective of cargo sharing, revenue pooling will be the norm. Cargo preferences are giving way to conference preferences. Indeed, it can be argued that were there not a conference system, it would be necessary to design one to achieve cargo allocation according to the UNCTAD Code.

But liner shipping is only one segment of the industry, and what has been said so far is not particularly new. There are other aspects of regulation that must be considered very important, given the topic at hand.

Economic theory pertains to the optimum allocation of scarce resources. Competition is, and has always been, one of the finest market regulators available for society to allocate its resources. Conversely, monopoly is one of the worst. Hence regulation has been aimed at the control of monopoly power and its abuse and intended to foster competition. But there are areas where competition does not work to the benefit of society. Transportation is one of them.

Too vigorous competition between carriers -- cut-throat competition -- leads to a deterioration of service and an unstable financial situation. Unnecessary duplication or waste often is the result as well. The overall efficiency and reliability of the system is likely to suffer and the society's goal of an adequate transportation system is not met. The realization that competition is not feasible in all circumstances in transportation, led to a change in the U.S. from regulation of monopoly abuse to the regulation of competition. This change came early with respect to U.S. shipping: the Shipping Act of 1916 which provided a certain measure of anti-trust immunity [7]. Although the expressed policy is to regulate competition, the actions taken, particularly by the U.S. Department of Justice, are clearly intended to regulate monopoly abuses.

In the current discussion in the U.S. of regulation versus deregulation of the shipping industry, it is important to keep the concepts straight. Deregulation with respect to the domestic transportation industry means that the full brunt of the anti-trust laws is put on the companies to enforce as much competition as possible. In international shipping, deregulation is the opposite. There, deregulation is seen as putting the anti-trust laws aside, to abolish them, and to allow the U.S. ocean carriers to join forces with foreign flag carriers in closed conferences. Such deregulation would mean that U.S. practices in ocean carriage would be in accord with those of the rest of the world, which is moving towards acceptance of the UNCTAD Code. The Code, in turn, is a recognition of the fact that regulation of competition is necessary to achieve rationalization of shipping services.

In the international arena of shipping, the Code embodies the peak of economic regulation. Its expansion into bulk carriage would obviously expand the scope of this type of regulation. Available studies do not allow an unequivocal assessment as to costs and benefits of economic regulation of liner shipping.

SOCIAL REGULATION

While economic regulation affects liner shipping only, social regulation affects all shipping. It has emerged in the last ten years, based on a new kind of regulatory philosophy pertaining to workers' welfare and the protection of environmental quality. This requires safer ships and, therefore, new standards of construction, operation, and training for seafarers. The ensuing regulatory requirements have had significant, and too often overlooked, economic consequences of both an operational and structural nature.

While all regulation is essentially in the public interest in the sense that it affects the overall welfare of society, there is a significant difference between economic and social regulation. The former focuses on markets, freight rates, entry conditions, and the common carrier obligations to serve: that is, on the questions who may charge what prices to whom -- for what services, where, and when? The philosophy of social regulation, on the other hand, is not concerned with these questions, but rather with the conditions under which the carrier discharges his duties. That is, it determines how the carrier performs his service; how, and to what level, the crew should be trained; how the ship should be constructed; and how and where certain necessary ship's operational procedures should be performed; how the ship should be equipped; how it should be routed; and similar areas of operations.

Consequently, social regulation extends into many more aspects of operations than does economic regulation. Government becomes involved with very detailed facets of the transportation process and, as a result, the ship operators have less freedom of action and decision-making. On balance, the government, or the regulatory agency, becomes a major factor in determining both services and cost levels.

It should be noted again that social regulation is not specifically directed toward any particular segment of the shipping industry. It affects the whole industry; but the economic impact is different on various sectors and is particularly felt in the tanker fleet and on operations in certain waters, such as the Arctic. The reason for this is that the perspective of policy-makers has changed from "How does the environment affect the ship?" to "How does the ship affect the environment?"

When regulating in terms of the first perspective, the impact of the environment is roughly equal on all ships. Variations would depend on size, climate, and season. In terms of the second perspective, however, it is the potential damage

that is paramount. Hence, the cargo becomes the important variable and tankers become the principal target [8].

The changing perspective and the extent to which government is brought into details of operations through social regulation often result in unforeseen problems. This is particularly evident in the 1973 Convention for the Prevention of Pollution from Ships. The Convention contains mandatory regulations for the control of "noxious liquid substances," defined with reference to their harmful effects on marine resources, human health, and legitimate uses of the sea. In essence, it attempts to control pollution by imposing constraints on the operation of ships as well as on their construction. Thus, all ships over 400 grt are prohibited from discharging any bilge, tank washings, or ballast water in designated areas -- specifically, the Mediterranean, Baltic, Black, and Red Seas, the Persian Gulf, and the Gulf of Oman. When outside these areas, discharges are allowed, provided several particular conditions are met. The conditions differ for tankers and non-tankers, with stricter regulations applying to tankers, but for both kinds of ship, they call for systems to monitor and control the discharge, as well as for special tanks to store oil residues. Such tanks are necessary because the conditions for discharging contaminated water are such that a major part of the oil must remain on board. For tankers, these slop tanks must have a capacity of at least three percent of the deadweight capacity, and special rules apply for the arrangements for pumping, piping, and discharge facilities. All types of oil-carrying vessels of at least 70,000 dwt. -- and this includes the combination carriers -- must have separate tanks to be used only for ballast. While there are a number of other rules of importance, these should suffice to indicate the scope of the Convention.

In addition, the Convention introduced a new perspective into regulation -- namely retroactivity. The rules were to apply not only to new ships but also to old ones after a certain grace period [9]. The economic consequences for operators of this Convention have been explored elsewhere [10]. Here I would like to look at some of the effects on a main regulatory agency in the U.S., namely the Coast Guard, which plays a major role in the implementation of regulations for vessel and port safety and environmental protection.

Essentially, the Coast Guard develops regulations and standards, often based upon international conventions it has helped to develop. As a result, they become more involved than before in ship's plan approval; new construction inspection; documentation and measurement; periodic inspections; compliance with various statutes and conventions; the licensing, qualification and testing of seafarers; with the manning of ships; with the determination of navigating routes in restricted areas; and with the monitoring and inspection of documents and similar activities. In addition, casualties are investigated to determine fault and to develop rules to prevent future accidents.

As mentioned earlier, the more detailed the regulation is, the greater is the demand on the resources of the regulatory agency, and administrative costs become significant. For the U.S. Coast Guard this has raised the issue of charging for its services. Some thorny issues arise in this respect. For what services should there be a charge? What should the charge be? Who pays it? When? Where? If the industry is to pay, ought it not have a say in what the service should be?

The vessel traffic service (VTS) is a good illustrative example of this issue. It is clearly a valuable and important service. Yet, if it is primarily a voluntary service, how should the use charge be assessed? Can a tariff be established? Is the service more valuable to one operator than to another? If the user charge is assessed as a surcharge on piloting fees, what about those who use the VTS without a pilot? Or would pilotage become mandatory with usage of VTS? Does this not infringe on a mariner's right to use a waterway? Or does such a right need re-definition?

The financial burden of growing regulatory responsibility coupled with the fact that several of the functions of documentation and inspection carried out by the Coast Guard overlap, and to some extent are performed in their stead, by the American Bureau of Shipping, has resulted in an explicit delegation of services to ABS and this is a worldwide trend.

In general, classification agencies are increasingly being called upon to perform regulatory services necessitated by IMCO conventions, particularly since the emphasis of the organization has in recent years changed from consultation to regulation, a change indicated also in the organization's new name -- the International Maritime Organization (IMO). Even the advanced maritime nations find it difficult, if not impossible, to administer something like MARPOL or SOLAS. Because of budgetary constraints, manpower shortages, and training requirements, the work is delegated in whole, or part, to the classification agencies. It must be noted, though, that there is a difference in perspective and approach between the official regulatory agency and a classification society. The perspective of the latter is essentially to determine risks for the purpose of insurance underwriting, while that of the former is to provide safety in the public interest. Also, classification agencies are primarily concerned with classed vessels; the regulatory agency's concern encompasses all ships. As some functions are delegated to the classification agencies, the public interest aspects of the agency become more visible; and if all services are performed by the classification society, the public interest aspect will sooner or later affect the institutions' character.

But there are other completely unexpected impacts of these, essentially worthy, international conventions. One example is the U.S. offshore service fleet. This fleet represents a significant part of the U.S. Merchant Marine. It is healthy and growing, but there are potential problems pertaining to ships' construction requirements, manning, and operations, all of which pose serious economic consequences for operators [11].

Offshore ships are built according to SOLAS International standards, but the rules have been relaxed and the Coast Guard is required to inspect these ships with special consideration given to the ship's size, type of operation, and length of voyage. This may change, however, because IMCO's 1969 International Convention on Tonnage Measurements of Ships (the Tonnage Convention), which goes into effect July 16, 1982, affects these ships radically. Under old measurement rules, the gross tonnage was based on carrying capacity; under the new Convention all spaces are measured.

The result is that a 200 ton vessel becomes about 1,350 tons. In effect, the ship becomes six times "larger". This means different construction standards with higher construction costs. It also has an effect on manning, licensing and on canal fees. On the whole, operating costs will increase.

It also ties construction to SOLAS in another way. SOLAS has at present a requirement for fire-fighting equipment for ships over 4,000 tons. An amendment will make this requirement applicable to offshore ships of 500 tons. Under the Tonnage Convention, a tug that at present is 150 tons will be remeasured at 500 tons and must thus have the fire-fighting equipment. This will raise construction costs by about 20 to 25 percent.

Another IMCO convention posing problems is the 1978 Convention on Standards for Training, Certification, and Watchkeeping for Seafarers. This Convention and the one on tonnages interact with each other with respect to small vessels. One provides for higher crew qualification standards, depending on the vessel's size; the other brings the ship into higher tonnages with corresponding higher standards under the Training Convention.

In the process there are problems in providing the crews with reasonable career patterns, because the sea-time required to qualify as a ship's master has doubled -- from three years to six. Given the offshore vessels' work schedule of seven days on/seven days off, six years sea-time may require twelve years calendar time (or eight years, if twelve hour days count for one and one-half days), thus making it difficult for a seaman to think in terms of a seafaring future with reasonable rates of advancement.

There are also other recent U.S. laws and regulations based on MARPOL that greatly affect the offshore vessel operators. As a result of the recently enacted Comprehensive Environmental Response Compensation and Liability Act of 1980, the small vessel owner is subjected to a very high exposure based on a per tonnage basis. Under this law, vessels that carry "hazardous cargoes" are subject to a liability exposure of \$300 per gross ton or \$5,000,000, whichever is greater. For vessels that do not carry "hazardous cargoes" the liability is \$300 per gross ton or \$500,000 whichever is greater. Thus, taking a typical offshore vessel of 200 tons, the liability is \$25,000 per ton if it carries hazardous cargo (which is normally does), or \$2,500 per ton in any other case. To qualify for the \$300 per ton liability, a ship carrying hazardous cargo would have to be very

large (16,666 grt), presumably a tanker, and for other cargo of rather substantial size (1,666 grt). The liability is inversely related to the potential for significant pollution. Since insurance must be purchased to cover liability, there is an impact on operating costs.

On balance, a major sector of the U.S. Merchant Marine is in the position of suffering adverse impacts from two international conventions, the effects of which have generally only been perceived as beneficial in all respects. Whether the net welfare balance for the U.S. is, indeed, positive is questionable.

There is one final area worth mentioning because it plays a role in the quest for a cleaner environment, yet little attention has been paid to it -- namely, the salvage industry.

As seaborne trade, particularly oil, grew and the awareness of the potential for environmental damage became a real force, regulation and technology brought forth safer ships. But as ship sizes grew, the safety of the ships could not outweigh the magnitude of the damage potential, and insurance became a major issue. This in turn raises the issue of salvage availability in case of need, and this raises new problems, because the structure of the salvage industry has changed.

In order to have an effective salvage system, tugs must be on station ready to respond to a call for help. This was the procedure until the 1960s. Marine peril was frequent, and the stationing of tugs to accident prone areas on a stand-by basis was commercially sound. Accidents happened often enough to justify having tugs dedicated for salvage only in a particular area or location. Today, these traditional salvage stations are not occupied. There is not enough salvage business for a tug company to survive on that alone.

Several things have happened to bring this about. Safety regulation and technology have brought about safer, more seaworthy, and more competently operated ships, all of which have resulted in less vulnerability to sea and weather. Hence, there are fewer accidents and no commercial basis for a stationary salvage tug. In addition, salvage awards in recent years have not been adequate to compensate for the waiting time between accidents. At the same time, salvage capability has increased and that is necessary because of the larger ships. However, what drives the technology of salvage vessels is not the need for salvaging, but the need to tow oil rigs.

Because the tugs are built for the towing of oil rigs, but they are capable of salvage, the structure of the salvage industry has changed. Instead of having dedicated salvage tugs, the operators have their equipment on shore in some strategic location; this is coupled with contractual agreements whereby tugs are available from some other operator if the need arises and the owned tugs are engaged on a long-haul tow.

In the final analysis, environmental concerns and international regulations demand that there should be prompt salvage action, if needed. However, technological progress and international regulations have resulted in safer ships, so that

the salvage industry has been forced to change its mode of operation. While the tugs now have greater capability than before, they are employed in such a way that they may be less available for salvage emergencies.

To conclude, the concerns of what we have called social regulation are undoubtedly valid. We do want a cleaner maritime environment, and we do want a shipping industry where both men and ships are safe. At the same time, we must also acknowledge the costs of achieving these objectives. Although this paper has not addressed itself to the quantitative costs and benefits of the rising tide of regulation in shipping, it should be clear that, while the benefits have been taken for granted and undoubtedly are great, there have also been substantial and unexpected costs and consequences.

NOTES

1. D. Marx, International Shipping Cartels (1953), p. 48.
2. In the U.S., the latest report to support the conference system, but with appropriate regulations, was the Bonner Report, properly titled Steamship Conference and Dual Rate Contracts, 87th Cong., 1st sess., S.R. 860, August 31, 1961. In Britain, it was the Rochdale Report, or Committee on Inquiry into Shipping, CMND. 4337 (HMSO), 1970.
3. The Liner Conference System, UNCTAD TD/B/C.4/62/Rev. (1970); and Convention on a Code of Conduct for Liner Conferences, April 6, 1974, UN Doc, TD/CODE/11/Rev. (1974).
4. Some of the more interesting works, apart from that of Marx and the various official investigations, are: A.R. Ferguson et al., The Economic Value of the U.S. Merchant Marine (1961); E. Bennathan and A.A. Walters, The Economics of Ocean Freight Rates (1969); B.M. Deakin and T. Seward, Shipping Conferences: A Study of Their Origins, Development and Economic Practices (1973); and U.S., Congress, Joint Economic Committee, Discriminatory Ocean Freight Rates; Gunnar Sletmo and Ernest Williams, Liner Conferences in the Container Age (1981).
5. U.S. Department of Justice, The Regulated Ocean Shipping Industry (1978); and I. Bryan and Y. Kotowitz, Shipping Conferences in Canada, Research Monograph no. 2, Research Branch, Bureau of Competition Policy, Consumer and Corporate Affairs, Canada, 1978.
6. "Liner Shipping in the U.S. Trades," special issue of Maritime Policy and Management, July 1978.
7. The Act has been basically reaffirmed in subsequent Acts: the Merchant Marine Act of 1920, the Merchant Marine Act of 1936; the Intercoastal Shipping Act of 1933. The Bonner Committee (1961) and the Celler Report (1962) again reaffirmed the basic soundness of the Act and, while introducing some changes, found some bounds should be placed on competition in shipping.

8. Whereas in the past insurance was taken to cover risks to the ship and the cargo, today's major insurance risk is for pollution liability. In the case of oil spill damages, insurance companies have claimed insufficient actuarial experience, and have been unwilling to assume full liability. As a result, some nations require evidence of financial responsibility for damages for tankers entering their territorial waters. To meet such demands, oil companies and tanker owners have arranged their own compensation funds on a voluntary, private cooperative basis. Two such schemes exist: the Tanker Owners Voluntary Agreement concerning Liability for Oil Pollution (TOVALOP) and the Contract Regarding Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL). In addition, the industry is subjected to two international liability conventions: one, the 1969 Civil Liability Convention which entered into force in 1975 assigns strict, but not absolute, liability to the ship owner; the other, the 1971 Compensation Fund Convention is an international fund financed by the contracting nations and is intended to give compensation in cases where the first convention is inadequate.
9. In the convention, new ships were those contracted for after 1975, those whose keel had been laid after June 30, 1976, or those delivered after 1979. For old ships, the rules would apply three years after the convention came into force. The convention has been absorbed in the 1978 Protocols to it and is now known as MARPOL 73/78 -- it has not yet entered into force, but it has been signed by 12 of the 15 necessary signatories.
10. Bernhard J. Abrahamsson, "The Marine Environment and Ocean Shipping: Some Implications for a New Law of the Sea," 31 International Organization 291 (1977).
11. The following draws upon a paper by Ralph Vaccaro, Jr., "Offshore Marine Transportation Service Companies," presented before the NACOA Task Force on Marine Transportation, February 27, 1981.

IMO: PUBLIC INTERNATIONAL LAW AND REGULATION

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The main emphasis of this paper will be on the impact of the provisions of the recently adopted Convention on the Law of the Sea and of current developments in state practice on two issues: (a) the application of rules and standards established by the International Maritime Organization; and (b) the enforcement of these rules and standards.

For the analysis of these issues, which are both of theoretical and practical importance, it seems useful to review the present situation of IMO as a global regulatory agency, and the prospects of its actions in this field, so that its possible developments in the near future can be seen more clearly.

IMO'S PRESENT FUNCTIONS AND ACTIVITIES

With its present membership of 122 states and one associate member, the universal character of this specialized agency of the United Nations can no longer be doubted, as was done in the period up to the early seventies.

The amendments to the Organization's Convention, which entered into force on May 22, 1982, not only changed the name, but also served to update the provisions on the standard-setting function of the Organization. The purposes of the Organization have been revised to include express reference to the activities which have already been undertaken by the Organization both for the prevention and control of marine pollution from ships and for the development of legal principles and regimes in matters related to the purposes set out in Article 1 of its own Convention. Previously, the only purposes specifically referred to in that Article were the promotion of international standards for maritime safety and efficiency of navigation. The revised Convention also provides formally for IMO to accept and perform functions in connection with any matters within its competence which may be assigned to it under international instruments relating to maritime matters.

When the 1977 and 1979 Amendments to the Convention enter into force, it can be assumed that the functions and structure of the Organization will not be substantially changed, although paragraphs (b) and (c) of Article 1 remain in an anomalous situation, as they have been since 1958, when the Organization started its operation. Although the Convention still confers on the Organization functions concerning discriminatory action and unnecessary restrictions by governments affecting shipping and unfair restrictive practices, these have never been taken up by the Organization; and since the establishment of UNCTAD, whose mandate includes consideration of economic and commercial aspects of shipping, it must now be assumed that the functions of IMO will, in the foreseeable future, be effectively limited

to what are described as technical related matters in respect of shipping and the prevention of ship-generated pollution of the sea.

Although IMO is mentioned only once in the text of the Convention on the Law of the Sea (in Article 2 of Annex VIII, dealing with the establishment and maintenance of lists of experts in respect of "navigation, including pollution from vessels and by dumping"), many of the references to "the competent international organization" undoubtedly recognize the standard-setting competence of IMO in these matters. Elsewhere under the Convention, IMO's competence is recognized principally, if not solely, in the field of "navigation, including pollution from ships and by dumping." The protection and preservation of the marine environment in general appears to have been considered as being within the competence of United Nations Environment Programme. This seems to be so even in the case of pollution in the Area, although clearly the International Seabed Authority will have certain responsibilities concerning the preservation of the marine environment on matters arising out of activities in the Area, as provided for in Part XI of the Convention.

This paper will not deal with IMO's work in relation to the standards and enforcement measures on ocean dumping, partly because they raise problems different from IMO's traditional functions, and partly because these activities derive from a separate Convention, the 1972 London Convention, which was not adopted under the auspices of IMO.

For an appraisal of the prospects of IMO's regulatory functions in the foreseeable future, an important decision unanimously taken by the Assembly of IMO should be mentioned. In 1979, the Assembly of the Organization decided to give priority to the implementation of international standards and regulations for the improvement of maritime safety and for the prevention and control of marine pollution from ships, rather than to the elaboration of new standards. It is likely, therefore, that upon entry into force of the two remaining important IMO Conventions not yet in force, namely, the 1973 MARPOL Convention as modified by the Protocol of 1978, and the 1978 Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), there will be a relative lull in the rule-making activities of the Organization and the existing standards will be allowed to apply unmodified for some years. By Resolution A.500 (XII), on the Objectives of the Organization in the 1980's, the Assembly of IMO in November 1981 determined that time was needed for maritime administrations to formulate national rules and regulations for effective implementation of IMO conventions and for the maritime industry to comply with such regulations. The Assembly accordingly requested the bodies of IMO to ensure that proposals for new conventions or amendments to existing conventions are to be entertained only on the basis of clear and well-documented demonstration of compelling need. In this regard the Assembly considered that it was undesirable to amend existing conventions

unless such Instruments have been in force for a reasonable period of time and experience has been gained on their operation.

At present, if we include the STCW 1978 and MARPOL 1973/78 Conventions, there are six IMO regulatory conventions, as follows:

- the International Convention on Load Lines, 1966
- the International Convention for the Safety of Life at Sea, 1974
- the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974
- the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto
- the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
- the Convention on the International Regulations for Preventing Collisions at Sea, 1972

The STCW Convention requires for its entry into force its acceptance by at least 25 states, the combined fleets of which constitute not less than fifty percent of the gross tonnage of the world's merchant fleet. Up to now 19 states have accepted the Convention; and the second condition for its entry into force has already been fulfilled. It is expected that the required number of acceptances will be received in 1982 and that the Convention will enter into force sometime in 1983.

The same is true of the 1973/78 MARPOL Instrument. This Instrument will enter into force twelve months after the date on which no less than fifteen states, the combined merchant fleets of which constitute no less than fifty percent of the gross tonnage of the world's merchant shipping, have become parties to it. Already there are 13 contracting states, with 41 percent of the world's tonnage. There is every expectation that the remaining acceptances (i.e., two states with more than 9 percent of the world's tonnage) will soon be received. If this happens the Convention will enter into force before the end of 1983.

The stringent conditions for entry into force of these two Conventions are more or less applicable to the other conventions listed above. This insistence of IMO on the criterion of "general acceptance" for its technical conventions, has some significance in the analysis which follows, especially in connection with the interpretation of this term when used in the U.N. Convention on the Law of the Sea.

The two "public law" Instruments elaborated by IMO, i.e., the 1969 Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties and its 1973 Protocol, are not properly "regulatory" in function and they are, therefore, not dealt with in this paper. It must be noted, however, that important issues in connection with these Instruments may arise in relation to the exclusive economic zone under the Law of the Sea Convention, and in particular under Article 221 thereof.

One of the most open-ended provisions of the Convention is contained in this Article, which refers to the right of states "pursuant to international law, both customary and conventional" to take certain measures outside the territorial sea. This expression raises a fundamental legal question regarding the relationship between customary and conventional law on matters connected with navigation and vessel-source pollution.

It must be noted that IMO's Legal Committee, as a consequence of the Amoco Cadiz disaster (which also led to the addition of a new paragraph 7 in Article 211 of the Law of the Sea Convention), has given preliminary consideration to the possibility of elaborating a protocol to the 1969 Intervention Convention. This matter is in the Legal Committee's Work Programme, and it is expected that the Committee will assign a degree of priority to it, after it has completed the major items on its immediate programme.

In what follows I shall attempt a summary examination of (a) the character of the rules and standards contained in the IMO instruments already mentioned, as a consequence of the adoption of the Convention on the Law of the Sea; and (b) the application of the enforcement provisions in these IMO Conventions, following the adoption in the "umbrella" Convention of norms on port and coastal state jurisdiction and enforcement, and in the light of current developments in state practice on port state jurisdiction.

RULES AND STANDARDS

The present paper does not intend to deal with the complexities and ambiguities of present international law with respect to the whole subject of "quasi-universal" treaties, and in particular with the creation or expression of customary law in the norms established by the Convention on the Law of the Sea [1]. The established opinion is that it is necessary to wait until the "quasi-universal" Convention on the Law of the Sea enters into force to apply its provisions. These provisions include that according to which obligations assumed under special conventions should be carried out in a manner consistent with the general principles and objectives of the Convention (Article 237, paragraph 2). The usefulness of exploring the subject is apparent. Yet, only states, individually or in a regional arrangement, or more appropriately within the competent international organization, can decide on the interpretation of the relevant provisions in the Convention, and their impact on IMO regulatory conventions, prior or after the entry into force of the Law of the Sea Convention.

It must be added that, as the material obligations contained in IMO's Conventions will be enforced, in the majority of cases, by port states, the analysis which follows may be somewhat abstract. This is generally so in the abundant literature on the subject.

It seems to me that the expression "generally accepted rules and standards", used throughout Parts II, III, IV, V, VII

and XII of the Convention, refers to the rules and standards in relevant conventions which have duly entered into force. There has not been a clear and agreed interpretation of this expression by or in the Conference on the Law of the Sea. A writer who has studied this question very closely describes this as a reference to "quasi-customary" law [2]. He states that it would "seem well-justified to require that in order to prove 'generally accepted' the international rules and standards should have sizeable support among the maritime states most affected by their implementation" [3]. The condition already indicated for the entry into force of IMO conventions -- that is, the requirement of a substantial number of states parties having among them more than half the tonnage of the world's merchant fleet -- seems to have precisely this purpose.

The interpretation of particular provisions of the Convention, mainly in Part XII, is by no means clear. The carefully chosen word "applicable", used throughout this Part to qualify the expression "international rules and standards", seems to refer to those rules and standards contained in conventions to which the enforcing state and at least in some cases also the flag state are Parties [4]. This appears to have been the reasoning behind the amendment proposed by Spain to Article 42, paragraph 1, which was put to vote during the last session of the Conference. Spain wanted to have the expression "generally accepted" instead of "applicable" to qualify the rules and standards regarding discharges which a bordering state may give effect to in their laws and regulations governing discharges in straits. Although the amendment received a majority of votes (60 for, 29 against with 51 abstentions), the amendment was not adopted according to the Rules of Procedure of the Conference. The issue was, therefore, not clearly settled. As a result, one faces a problem of inconsistency in language. Article 39, paragraph 2(b) prescribes that ships in transit passage through straits "shall comply with generally accepted international regulations, procedures and practices for the prevention, reduction and control of pollution from ships." Thus, flag states are bound to comply with generally accepted rules and standards during transit passage.

The same expression, "generally accepted international regulations, procedures and practices" is used in paragraph 2(a) of the same Article 39 in connection with safety at sea, and also in Article 94, paragraph 5, to be examined later. It has been maintained that this expression is broader in scope than "rules and standards" used elsewhere. IMO treaty instruments are supplemented and reinforced by a very large number of codes, recommended practices and guidelines in the form of resolutions of IMO Assembly (or in some cases committees of the organization), which are not binding internationally, but which are applied by states through their national legislation. It may be wondered whether there can be any valid reason or support for considering that these resolutions of a non-binding character could become obligatory for states, as a result of this particular drafting of provisions in the Convention of the

Law of the Sea. If not, then the conclusion might be that for the discussion of flag states' obligations, it would be correct to consider "generally accepted rules and standards" and other slightly different expressions as referring only to those contained in IMO Conventions in force.

The provisions in the Convention on the Law of the Sea concerning duties of the flag State are contained in broad terms in Article 94; and, with relation to prevention, reduction and control of pollution, in Article 211, paragraph 2.

Paragraphs 3, 4 and 5 of Article 94 merit some close examination. The first prescribes that "[e]very State shall take measures for ships flying its flag as are necessary to ensure safety at sea, with regard, *inter alia* to: (a) the construction, equipment and seaworthiness of ships; (b) the manning of ships, labour conditions and the training of crews ...; and (c) the use of signals, the maintenance of communications and the prevention of collisions." For some unexplained reason, the provision on manning of ships, labour conditions and training of crews, requires that measures shall "take the applicable international instruments into account" while, as will be seen, paragraph 5 is drafted in a mandatory way. Moreover, with respect to labour conditions, ILO Convention 147 concerning minimum standards in merchant ships, 1976, has been in force since November 28, 1981, and applies to all ships for purpose of jurisdiction by port States which have ratified the Convention (Article 4). The ILO Convention is linked to the IMO Convention on safety standards (Article 5).

Paragraph 4 of Article 94 of the Law of the Sea Convention details some of the measures which the flag state must take to ensure regular surveys; appropriate equipment and instruments for the safe navigation of the ship; appropriate qualifications for the master, officers and crew; knowledge by these of and requirement to observe "the applicable international regulations concerning the safety of life at sea, the prevention of collisions, the prevention, reduction and control of marine pollution, and the maintenance of communications by radio." All these matters fall into IMO's regulatory functions, as previously defined.

Paragraph 5 seems to establish a binding obligation for flag states of a quasi-universal character, when it prescribes: "In taking the measures called for in paragraph 3 and 4 each State is required to conform to generally accepted international regulations, procedures and practices and to take any steps which may be necessary to secure their observance." Yet paragraph 6 seems to confer, as in the earlier IMO Conventions, enforcement powers to the flag state itself. The other states, in case they have "clear grounds to believe that proper jurisdiction and control with respect to a ship have not been exercised," have the faculty of reporting the facts to the flag state. It must be taken into account, however, that Article 94 is placed in Part VII on the high seas.

The parallel provision in Part XII is more precisely worded and, of course, is followed by detailed clarifications on the

respective roles of coastal and port states on standard-setting and enforcement in the different areas of the oceans. The provision on flag states' obligations is established in Article 211, paragraph 2, which reads:

States shall adopt laws and regulations for the prevention, reduction and control of pollution of the marine environment from vessels flying their flag or of their registry. Such laws and regulations shall at least have the same effect as that of generally accepted international rules and standards established through the competent international organization or general diplomatic conference.

As will be discussed in the following section, it seems to have been accepted without question in the Law of the Sea Convention that the port state has complete jurisdictional and enforcement powers over violations committed in its internal waters or territorial sea. Here, only a few words will be said concerning these standard-setting powers of the coastal state in its territorial sea.

The crucial provision, the application of which will be probably tested prior to the entry into force of the Convention, is contained in the much discussed and controversial Article 21 of Part II. Paragraph 1 states:

The coastal State may adopt laws and regulations, in conformity with the provisions of this Convention and other rules of international law, relating to innocent passage through the territorial sea, in respect of all or any of the following:

- (a) the safety of navigation and the regulation of maritime traffic;
-
- (f) the preservation of the environment of the coastal State and the prevention, reduction and control of pollution thereof.

Paragraph 2 limits the powers of the coastal state in its territorial sea, prescribing that "such laws and regulations shall not apply to the design, construction, manning or equipment of foreign ships unless they are giving effect to generally accepted international rules or standards."

A discussion of this provision in connection with those of Article 27, paragraph 5; Article 211, paragraph 4; and Article 220, paragraph 2, would go beyond the scope of the present paper. The intention of the drafting of Article 21(2) seems clear: in matters of ship design, construction, manning or equipment of vessels, the coastal state can only regulate the innocent passage through its territorial sea in accordance with the provisions of the rules and standards contained in the relevant IMO Conventions.

ENFORCEMENT PROVISIONS, PRINCIPLES AND PRACTICES

There is hardly any doubt concerning a state's right to establish conditions for access to its ports. Article 25, paragraph 2, of the Law of the Sea Convention (reproducing the substance of Article 16(2) of the 1958 Convention on the Territorial Sea), states:

In the case of ships proceeding to internal waters or a call at a port facility outside internal waters, the coastal State also has the right to take the necessary steps to prevent any breach of the conditions to which admission of those ships to internal waters or such a call is subject.

In Part XII, there is a provision on co-operative arrangements by states which establishes "particular requirements for the prevention, reduction and control of pollution ... as a condition for the entry of foreign vessels to their ports or internal waters" (Article 212(3)). This provision contains mandatory obligations for the master of any ship navigating within the territorial sea of a state participating in such arrangements, proceeding to a state of the same region participating in the arrangement, to indicate whether his ship complies with the port entry requirements of that state.

This understanding of the rights of a port state appears to coincide with IMO's conception of the scope and purpose of port state control. Resolution A.412(XI) adopted in November 1979, recommends that all governments "establish their national regulations in conformity with the provisions" of SOLAS 1974 and its Protocol of 1978; of MARPOL 73/78 and STCW Convention of 1978, "and take appropriate steps to enforce those regulations" for all ships. The same Resolution recommends also that governments "which consider it necessary to introduce requirements applicable to foreign ships which deviate from the international standards and rules adopted by IMO, submit the requirements to the Organization for discussion, with a view to arriving at an international agreement."

Both MARPOL 73/78 and STCW Conventions contain a common provision according to which nothing in them "shall prejudice the codification and development of the law of the sea by the United Nations Conference on the Law of the Sea." (Article 9(2), and Article V(4), respectively).

MARPOL Convention contains, furthermore, an interesting updating provision of its clauses on jurisdiction. This is Article 9(3), according to which "the term 'jurisdiction' in the Convention shall be construed in the light of international law in force at the time of application or interpretation of the Convention."

As had been indicated, there is no provision in the Law of the Sea Convention concerning how and when its jurisdictional clauses on navigation and vessel source pollution should be

conventional. Neither MARPOL nor STCW has provisions on the subject. The issue remains thus open. This paper only deals with the enforcement powers of the port state under the Law of the Sea and IMO Conventions. Article 220(1) of the Law of the Sea Convention confers wide-ranging powers on the port state in prescribing:

When a vessel is voluntarily within a port or at an off-shore terminal of a State, that State may, subject to section 7, institute proceedings in respect of any violation of its laws and regulations adopted in accordance with this Convention or applicable international rules and standards for the prevention, reduction and control of pollution from vessels when the violation has occurred within the territorial sea or the exclusive economic zone of that State.

Article 218(1) confers also on the port state the authority to institute proceedings in respect of any discharge outside its jurisdiction and on the high seas in violation of "applicable international rules and standards."

Under Article 4(2) of the MARPOL Convention, "any violation of the requirements of the Convention within the jurisdiction of any Party to the Convention" entitles this state to cause proceedings to be taken in accordance with its law, presumably in its ports. And according to the most innovative provision of MARPOL, "with respect to ships of non-Parties to the Convention, Parties shall apply the requirements of the Convention as may be necessary to ensure that no more favourable treatment is given to such ships" (Article 5(4)). A similar provision appears in STCW Convention (Article X(5)). As mentioned earlier, ILO Convention 147 clearly endorses administrative enforcement action against sub-standard ships of states which are not party to the Convention.

Fourteen countries of Western Europe, without any apparent inhibitions on account of the complexities of international law, have availed themselves, without objections from other states, of the above mentioned provisions. These states are establishing, with effect from July 1, 1982, a very carefully drawn common system of port state control by the maritime authorities of each participating country. To this effect the ministers responsible for maritime safety in these 14 countries signed a Declaration on January 26, 1982, approving a memorandum of understanding which was signed on the same date by their marine authorities. It is interesting to note that the Memorandum does not refer at all to the provisions of the Convention on the Law of the Sea.

The preambular part of this Memorandum of Understanding, although declaring that the principal responsibility for the effective application of standards laid down in international instruments rests upon the flag state, recognizes that effective action by the port states is required to prevent the operation of sub-standard ships. The Memorandum mentions an important

policy consideration for these common arrangements, "recognizing the need to avoid distorting competition among ports."

The state parties to this Instrument undertake to maintain an effective system of port state control to ensure that all ships comply with the standards laid down in "the relevant instruments". These instruments are those mentioned at the beginning of this paper, and also ILO Convention 147. As two of the instruments have not yet entered into force, there is the important proviso: "that each Authority will apply those relevant instruments which are in force and to which its State is a Party." There is also a provision under which the application to ships of non-parties to those instruments is made effective in a similar way to that stipulated in the MARPOL and STCW Conventions, although with a broader scope of application.

The Memorandum contemplates inspection and detention of ships by the port states, but there is no mention of prosecution by them. Prosecution by a port state would be in conformity with general international law. Thus, the fact that neither the Law of the Sea, MARPOL, nor STCW Conventions has entered yet into force, would not make unlawful the exercise of this power.

It must be added that other important states in maritime trade, such as the United States, have assumed in their domestic legislation full enforcement powers for ships which are voluntarily in their ports and internal waters.

Thus, there is already a trend in the practice of states to enforce the "generally accepted rules and standards" by means of the exercise of port state jurisdiction.

SOME TENTATIVE CONCLUSIONS

1. The regulatory functions of IMO in the technical fields of navigation and vessel-source pollution are confirmed, and in some cases strengthened, by the provisions of the Convention on the Law of the Sea, and by the practice of states. The Convention, however, does not alter the character of IMO as an international agency without "enforcement powers" of its own.
2. The most notable advance in this respect in the Convention on the Law of the Sea seems to be the making of IMO "generally accepted rules and standards" mandatory for all flag states. However, it seems that, except otherwise decided, this obligation cannot be considered to be operative until the Law of the Sea Convention enters into force.
3. Several issues concerning the role of customary international law on the application of the provisions of the Law of the Sea Convention and IMO Convention remain unresolved, in particular with relation to jurisdictional matters.
4. Since the Law of the Sea Convention does not clarify the interpretation of the terms "generally accepted" and "applicable" used to qualify "international rules and standards," it is likely that states, either through IMO or

by means of their practice at the national or regional levels, will have to determine their own interpretation. The most reasonable interpretation seems to be that "generally accepted rules and standards" are those embodied in relevant IMO Conventions which are in force, although it will remain open to question whether this interpretation will extend to all states or only to those for whom the instruments are in force.

5. States would have to decide in the same way whether all or some Law of the Sea Convention provisions on navigation and vessel-source pollution, in view of their character and/or their adoption by consensus, should be applied prior to the entry into force of the Convention. This relates to the issue of which provisions are codification of existing international law and which constitute the development of new international law.
6. It is to be hoped that during the period of consolidation, stipulated by the terms of resolution A.500 (XII), IMO bodies will devote a greater part of their time and effort to some of the issues examined in this paper, including a study of the interpretation and application of IMO rules and standards, both within the context of IMO and in the wider context of the Law of the Sea Convention.
7. The current trend in state practice concerning port enforcement shows that port state control represents a major way of making the implementation of rules and standards contained in IMO's conventions more effective.

*The views expressed here are those of the author and are not intended to reflect the opinion of IMO or of its Secretariat.

NOTES

1. Prosper Weil, "Vers une Normativité Relative en Droit International?", 86 Revue Generale de Droit International Public 5 (1982).
2. Kari Hakappa, Marine Pollution in International Law (1981).
3. Ibid., at p. 121.
4. It seems that rules and standards "applicable" under international law, such as those concerning port state enforcement powers for violations committed in internal waters or in the territorial sea of the port state, are included in this concept. Ibid., pp. 118, 172.

THE U.N. LINER CODE REVISITED

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INTRODUCTION

There can only be a finite number of ways in which the Liner Code can be written or spoken about, and after eight years of tackling it from every possible angle in every continent except Australia (which voted for it), one may be forgiven for having diminishing enthusiasm about facing another expectant audience on the subject! However, 56 countries are now parties to the Code -- a heroic achievement in itself, as maritime conventions go. Since these countries own 20.81% of world tonnage and the EEC countries are now also committed to ratification and enabling legislation, it appears to be finally on the cards that the remaining 4.19% of world tonnage support will soon be forthcoming to bring the Code into effect. (Note: Since this talk was delivered, the Federal Republic of Germany and The Netherlands ratified the Convention and the Liner Code of Conduct entered into force internationally on October 6, 1983.)

I believe sufficient information about the Code and its objectives is generally available to allow me to deal briefly with the historical background. Most of this paper will deal with the main provisions and the salient issues: the essence of the Code; what it was meant to accomplish; the status of recent arguments for and against some of its major provisions; questions of implementation; and its future, particularly in light of extensive personal discussion over the last few years with concerned interests from a widely representative international circle reflecting varied views.

THE CONFERENCE SYSTEM: HISTORICAL BACKGROUND

Since 1875 shipping lines have been coming together voluntarily as "Conferences" to provide regular cargo services in designated "liner trades", controlling through self-regulation such questions as membership, levels of freight, sailings, routes, division or pooling of cargoes/revenues, and "tying" loyalty arrangements with shippers at discounted and/or rebated rates to oust "non-conference (outsider)" competition. A third of all Conferences are, however, regulated by national statute: for example, in all U.S. liner trades, inwards and outwards.

Conferences are usually classified as cartels, but they are also treated variously as unincorporated associations or as possessing corporate legal identity. They are, in most trades, either exempt from anti-restrictive practices laws, on the ground that their operations are considered not to be in

restraint of trade, or are acquiesced in. Conference agreements and loyalty arrangements are thus usually characterized as valid contracts, and upheld by the courts. Complainants against the system cannot, therefore, seek recourse to the courts with much hope of success.

Conferences are generally acknowledged to have eradicated disruptive competition, achieved reasonably uniform stable rates, and maintained regular services. Complaints, particularly from developing countries, are based on a number of allegations: denial of benefits of competition; unilateral imposition of rates and increases; prolongation of surcharges, without convincing justification; punitive loyalty arrangements and frequent denial of dispensation to use non-Conference tonnage, when Conference ships are unavailable; inadequate services; complacency over shippers' concerns; and excessively demanding criteria for membership. Conferences counter-assert that their consultation processes instituted by them in the 1950's provide adequate remedies for the needs of the trades. In question, an argument which is in turn unacceptable to its critics, since consultation as practiced still leaves the last word to the Conferences.

Analysts generally identify these basic, but overlapping, problems: (1) how to achieve a desirable degree of rate stability in the liner industry, with its unique cost characteristics, without sacrificing the flexibility Conferences demand; (2) how to rationalize the industry without losing the "spur" to efficiency provided by competition; and (3) how to achieve the concentration of power necessary to maintain the desired stability and rationalization without perpetrating monopolistic abuses. Conference practices have been investigated since 1907 in the U.K., U.S.A., and several other countries. Investigations have generally acknowledged the need for Conferences, but they have also advocated greater accountability to shippers and governments to prevent abuse of cartel power. In some cases, notably the U.S.A., the investigations led to statutory regulation of Conferences conferring immunity from that country's anti-trust laws. Elsewhere Conferences have operated more or less freely without Governmental intervention, although increasingly since the early 1950's they have had to intercede on behalf of their national lines or shippers in sorting out problems over membership and freight levels. No international investigations were held until the developing countries took up the matter in the late 1960's within UNCTAD.

While, therefore, *prima facie* restrictive of competition, Conferences have operated freely on a world-wide basis, supported partly by public indifference and partly by two important legal provisions: (1) under common-law, by virtue of a leading English House of Lords decision, in the case mostly of self-regulated non-U.S.A. liner trades (two-thirds of all Conferences traffic); (2) under statute law, by virtue of a U.S. national statute, (the Shipping Act of 1916, as variously amended), and similar enactments, in the case of the remaining one-third of all Conference traffic in mostly U.S. liner trades.

It would be useful at this point to place the Conference system into historical perspective. Three periods should be distinguished. The first was the "classical" period from 1875 to 1944/45, when the self-regulated Conferences were largely masters of their operations and managed to keep out all but the strongest and most persistent competitors, and to set and increase freights at will. At that time developing country fleets, as we know them, were either non-existent or could not secure admission to Conferences. Their exclusion would be maintained as long as there were no politically independent supporting governments to press their case, or indeed any forum where their cause could be heard objectively, since "insider" Conference practices were confidential and known only to the member lines. Further, since the Conference system was firmly embedded in 19th-century freedom-of-contracting legal principles, there were no legal means whereby shippers who had signed "loyalty" agreements with Conferences could secure release from their obligations by pleading *force majeure*, undue influence or inequity. Since also there was no alternative source of liner traffic, shippers were in a sense captive clientele.

The second period was the immediate post-war period (1945-64) when the more industrially advanced developing countries, in changing political conditions, managed after tremendous struggles to acquire membership rights for their fleets in some conferences serving their countries. While limited consultation facilities were conceded to shippers, the final decision-making powers still rested with Conferences. Moreover, new lines were admitted into membership of many Conferences only after they signed undertakings not to support any cargo-sharing or other pro-shipper initiatives on the part of their governments, under continuing conditions of secrecy.

The final period is that subsequent to the advent of UNCTAD, 1964, up to the adoption of the Code in 1974, when the commercial and economic aspects of shipping could be discussed publicly among developing, developed and socialist countries within the U.N. system.

PRINCIPLES AND OBJECTIVES

The Liner Code was adopted by a U.N. diplomatic conference in April 1974. It was adopted by 74 votes to 7 against, with 5 abstentions. Fifty-eight developing countries voted for the Code (plus Turkey which is classified geographically within developed countries of Europe), and they were supported by the Socialist countries of Eastern Europe, China, Australia, Belgium, France, the Federal Republic of Germany and Japan. Canada, Greece, Italy, Holland and New Zealand abstained from voting, while the Scandinavian countries, U.K., U.S.A. and Switzerland voted against.

The principles and objectives were addressed to stimulate the development of regular efficient liner services so as to assure a balance of interests between the suppliers and users of

liner services, to guarantee non-discrimination against shipowners, shippers or foreign trades of any country, and to provide emphasis on "meaningful" consultation between shippers and conferences, with the participation of appropriate authorities, if requested. The main substantive provisions of the Code are these:

Article 1 establishes, subject to states criteria, rights to membership of Conferences of national and third flag shipping lines.

Article 2 sets out, with the proviso "unless otherwise mutually agreed," the principle of equal shares in any pooling or other similar arrangement for liners in importing and exporting countries, with "a significant share," indicatively given as 20 percent, to third flag lines, where such exist.

Article 7 notes that loyalty arrangements with shippers are authorized, but that they should be based on the contract system or any other system which is also lawful.

Article 9 provides that tariffs and related conditions and/or regulations should be made available at reasonable cost to shippers and other parties concerned.

Article 10 provides for annual reporting by Conferences of their activities.

Article 11 establishes that consultations be held between Conferences and shippers.

Article 12 sets out criteria for freight rates determination, with a proviso that other criteria might be agreed.

Article 14 provides for notice of freight rate increases and reference to international mandatory conciliation for disputes which may not have been resolved through consultation.

The Code also provides (Articles 23 to 46) for the settlement of disputes through mandatory conciliation. The parties can agree on other lawful procedures provided these are not inconsistent with the principles of the Code, but for disputes on freight this freedom is only available if shippers are not debarred by national legislation from exercising it. Conciliators' recommendations would only bind parties, if they are not rejected by one or more of them.

Finally, the Code is to enter into force six months after 24 states, whose combined tonnage (based on 1973 Lloyd's Register of Shipping statistical tables) amounts to at least 25% of world tonnage, have become contracting parties to it; and provision was made for five-yearly Review Conferences.

SCOPE AND IMPACT

It is usually unproductive to discuss the impact of the Code in general terms with reference to Conferences as a whole. There are some 370 Conferences or freight agreements operating world-wide, organically unrelated and serving a variety of liner trades. Each Conference trade is autonomous, with separate rules, range of operations, customs, practices, and its own peculiar characteristics and outlooks on relevant issues and

problems. Indeed, for this reason the whole thrust of the Code is directed at the "trade concerned": that is, to individual Conferences, each of which maintains its own balance at any one time between national lines, third flag lines, the Conference itself, and shippers. The interests of affected governments range from total indifference to a policy of monitoring the Conference as closely as possible. Criticisms are, accordingly, valid only when addressed to the conditions prevailing in a designated Conference. Unless one views the Code in terms of how it would be interpreted and applied in a particular Conference, one can go hopelessly wrong in making abstract judgments. Normally the interpreters and appliers of the Code in a particular trade will be the Conferences and shippers working under actual day-to-day commercial pressures. It is they who tackle and resolve issues and problems pragmatically as they arise in the course of business. It is from their practical experience that a body of true knowledge on the Code will evolve, accumulate, and become incorporated into the five-yearly Review Conferences, and thus keep the Code au courant with actual events and changes. In publicly regulated Conferences, on the other hand, direction will be by statute and the diktat of the regulatory body.

What about the status and sensitivities of the trade at the "receiving end" of an out bound Conference trade (most conferences are out bound), where the government concerned may not be a contracting party? I believe that this question is not of great practical importance in most cases, because no question of conflict arises as long as the non-contracting government, for reasons of policy or indifference, acquiesces in the operation of Conference services within its jurisdiction. This, in fact, is the existing position in two-thirds of all Conferences: that is, in self-regulated Conferences, where they operate without formal governmental controls of any kind and where, whenever public policy issues arise, the matter is usually resolved through negotiations between the government departments concerned and the Conference authorities. A similar position would prevail under the Code, except that its provisions would be viewed as a norm of international law of high persuasive value against which the particular problems would prima facie be assessed without prejudice to such rights of sovereignty as the non-contracting state may wish to exercise.

Thus, subject to the particular situation prevailing in a country, the scope of the Code would appear to be as follows. Prima facie, it will apply to what are now called "self-regulated" Conferences: that is, Conferences which do not serve U.S.-type regulated liner trades. Conferences which are publicly and comprehensively regulated, both inwards and outwards, inconsistently with the provisions of the Code will fall outside the scope of the Code, as long as non-contracting states overtly reject it and do not permit its provisions to apply within their national jurisdiction. By the same token, a state might not be a contracting party, and yet acquiesce in the

functioning of the Code within its jurisdiction. Some one-third of all Conferences serve U.S. liner trades, which are regulated inwards and outwards by statute law and regulation. The Code will thus, prima facie, apply only to the remaining two-thirds of the world's Conferences, as long as the U.S.A. or other non-contracting states do not accept or acquiesce in the operation of the Code within their jurisdiction. Liner Conferences trading with such countries will continue to function as they do today, and any conflict will have to be resolved, as now, either by diplomacy or legal means. On the basis of statements made at the conclusion of the diplomatic conference, and subsequent reservations made by many states, the Code will not prima facie apply to Inter-governmentally sponsored bilateral agreements that are unequivocally kept outside the scope of the usual type of Conference services.

The shipping scene is, of course, dynamic, and one can never tell how a situation may change in a particular trade. Debates continue in the few remaining countries which are believed to be against the Code. Once the Code is implemented, however, new insights will certainly arise from experience, and hopefully in time a communication bridge might emerge to harmonize the different practices followed in the different trades, replacing the present transitory phase in international liner shipping policies.

In viewing the Code, it is also important to appreciate that it is quite untrue that everything in the Code represents what the developing countries wanted. They certainly initiated moves for a Code, but the adopted text reflects a compromise agreed to by all those countries which voted for, and have since accepted, the Code. Not only is the Code not a developing countries' Code, but many of its key provisions were sponsored by the developed countries: for example, its conciliation mechanism. Nor is it correct that the Code was "bloc-voted" through by the developing countries. Australia, Belgium, France, West Germany, Japan, the Eastern European socialist countries, Turkey and China also voted for the Code, while Canada, Greece, Holland, Italy and New Zealand abstained.

The Code is basically a public ordering of what is at present diffuse and private, even secret. It does not subvert existing Conference practices, but rather democratizes them. The sole innovation, perhaps, is the establishment of an independent dispute settlement machinery through conciliation, which in fact was substituted by the developed countries in place of arbitration, the original choice of the developing countries. Many critics allege that the Code introduces cargo-sharing. In fact cargo-sharing was introduced into liner shipping as long ago as 1875 by the Conferences themselves, and allocation of cargo by flag can no longer be termed innovative. It exists in both self-regulated and in several U.S. liner trade agreements. It should also be noted that, although shippers from developed countries have largely learnt to live with the existing Conference system without taking serious umbrage, in most developing countries shipper problems are serious enough to

warrant the equities the Code seeks to introduce. One should be careful with glib statements that shippers, as a whole, are satisfied with this or that feature of Conference services, and that the Code was thought up by ivory-tower conceptualists who are out of touch with shipping realities. The proceedings of the diplomatic Conference which adopted the Code should make clear to the most disbelieving skeptic the solid base of widespread grievance which underlay its adoption.

One has to allow for the dynamism which exists in shipping. Static outlooks can only misdirect perceptions. One has to recognize that the Code would not be establishing a completely new system on virgin commercial territory, but in most cases would be adapting existing self-regulatory practices. It is also important to note that the Conference system, particularly in the last ten to fifteen years, has been in a condition of chronic disarray. Complaints from shippers about freight levels and the inadequacy of service, and from Conferences about the growing competition from "outsider" lines are pandemic. To the extent Conferences complain about government "intervention," shippers frequently invite it! The Code will not, therefore, disrupt an idyllic state of affairs. In fact, controversies over membership, cargo-shares, freight levels, dispensation and "outsider" competition have perennially plagued Conferences which nonetheless have survived as institutions despite spasms of abolition, disruption and desuetude. For over a year near-anarchic conditions have had ravaging effects on several major Far Eastern and Asian sub-continent Conferences, but these same conditions have been described to me by responsible shipper representatives, earlier this year, as "perfect, could not be better!" That observation underlines the need to probe the sources of criticism, if we wish to acquire a balanced perception of the total picture of Conference operations. Thus the Code, which purports to respond to both Conference and shipper interests, needs to be analyzed in a modern bi-partisan context, if correct and viable assessments are to be drawn. It is unhelpful to evaluate the Code only from the shipowners' point of view, or the shippers'. One has to balance what one party may appear to have gained in a particular provision of the Code against what it may appear to have conceded in another, and vice versa. We cannot seriously expect any agreement of this type to satisfy every single whim and fancy of every shipowner, shipper and government in the world. The self-regulated Conferences do not do so. The publicly regulated Conferences do not do so. Why, then, should the Code be criticized for not doing so?

The principal concessions made by the developing countries were:

- (a) agreement to replace mandatory arbitration by conciliation;
- (b) adoption of the punishing entry-into-force conditions of the Code; and
- (c) acceptance of a substantial element of flexibility in various provisions which closely affect Conference

revenues, relating principally to membership, trade participation, freight and the conciliation mechanism.

In exchange they received:

- (a) acknowledgement of the rights of exporting, importing and third-flag states to cargo-sharing within an agreed framework of what were felt to be equitable principles;
- (b) acceptance of an International Convention as the designated regulatory legal instrument;
- (c) institutionalization of "meaningful" consultation over a comprehensive range of subject matters, including freight, as a principal co-ordinative mechanism for the implementation of the Code; and
- (d) conciliation as a mandatory dispute settlement machinery.

It is useful to keep this trade-off in mind whenever the Code is discussed, because past and present criticism of the Code nearly always appears to be predicated upon the assumption that it would introduce a completely novel situation, as far as Conference conditions are concerned: that it would disrupt an efficiently organized system in which shipowners and shippers live in nearly total harmony with one another and in which the few problems which arise in the course of daily business are readily and amicably resolved. The correct overall picture is quite different. You only have to read the shipping press! Conferences have been in deeper trouble than ever within the last ten to fifteen years. There are recurrent complaints from shippers about freight level increases imposed without full consultation, and surcharges retained long after justification has been exhausted, to say nothing of complaints about inefficiency, inadequacy of services, and delays over dispensation. There have been serious breakdowns of service in major trading centers, and lines have left and rejoined Conferences with increasing frequency and impunity. Problems introduced by the unitization of cargo, or the lack of it, have equally bedevilled several trades seriously. Critics in fact often discuss the Code as if it is the Code which has caused, or will cause, these types of problems. Sometimes, in the alternative, they argue that since the Conference system is in disarray, the Code is more irrelevant!

These are formidable allegations, but they are both misconceived and untested by experience. The fact is that the Code will have operative effect within each Conference where it is to apply. If there are problems in a particular Conference, the solution would be not to withhold application of the Code, but to apply it with a view to resolution of existing difficulties. For example, with regard to the advent of containerization, with large chunks of trade disrupted in many trades as a result of "outsider" activity, which has consumed up to 80 percent and more of conventional break-bulk Conference liner traffic, some critics say the Code is no longer relevant, not only because they allege it cannot apply to container

traffic but also because of the current disruptions which the Code would not be able to contain or control.

I believe the answer to these two charges is as follows. The Code enunciates principles on cargo-sharing which would be equally applicable to containerized traffic as to conventional modes of transport. With the system of cross slot charters, "self-consignment" proceedings, or modifications thereof, it should not prove to be more difficult than it now is to handle containers under the Code. In regard to the treatment of disruption of traffic, what other alternative can the critics provide for solution? Manifestly, none which would introduce order. The Code is a first modest step to regulate liner traffic. The provision of five-yearly Review Conferences permits major practical problems to be reported to contracting states and resolved on a regular basis, so that proven errors or mistakes may be corrected, lacunae filled in, and greater efficiency and equillability established. You cannot get more pragmatic than that!

JURIDICAL AND OPERATIONAL NATURE OF THE CODE

The Code, in the form of a Convention, is a treaty of the United Nations, and is subject to treaty law and interpretation. However, there are certain refinements arising from the nature of liner Conference operations to which the Code is intended to apply, and these need careful noting.

There is, first, the series of institutive juridical acts foreseen for each state, whereby it becomes a contracting party through signature, ratification or accession. This creates a parallel obligation, either simultaneous or subsequent, to take "such legislative or other measures as may be necessary to implement the Convention" (Articles 47 and 48). Implementation implies that liner Conferences and cargo shippers together give effect to the Code through the operation of the relevant shipping services in the various Conferences falling within the jurisdiction of a contracting party state. These services operate under the terms of Conference agreements, trade participation agreements, and loyalty contracts or arrangements, wherein are set out the rights and obligations of the Conference member lines and their client shippers. Once the Code is in force and state contracting parties move to implement it under Articles 47 and 48, then under Article 22 the agreements and arrangements referred to "shall conform to the applicable requirements of [the] Code and may include such other provisions as may be agreed which are not inconsistent with [the] Code," and action to that effect has to be taken in hand [emphasis added].

There are, then, three distinct juridical phases: the entry into force of the Code by virtue of Article 49; the passing of legislation or other measures by that state (Article 47); and the adoption of Conference agreements, trade participation agreements, loyalty arrangements, and other agreed provisions not inconsistent with the Code (Article 22), either as fresh texts or as amended.

We can now identify the main parties concerned in Conference liner operations as envisaged under the Code, and review their respective roles in implementation. These parties may be governmental, private or independent.

Governments: In their capacity as contracting parties or states, governments will in most cases just drop out of the picture after depositing their Instrument with the U.N. and drawing up the necessary legislative or other measures to implement the Code. In the event of any treaty litigation affecting them, governments may, however, become "reactivated". In some situations it may be found expedient in certain trades for conferences to operate under the Code within the umbrella of bilateral governmental agreements. There might be a role for state action there, but generally speaking, in most hitherto self-regulated Conferences, any continuous governmental "presence" would basically devolve on their "appropriate authorities". This may take several forms: for example, in participation "fully", upon request, in "meaningful" consultations between Conferences and shippers, without a "decision-making role" (Principles and Objectives, and Article 11); in receiving Conference agreements and reports on Conference operations (Articles 5, 6, and 10); in receiving notifications on freight matters (Articles 14 and 15); in reviewing the adequacy of Conference services (Article 19); in participating, on request, in international mandatory conciliation in support of national or other interested parties, or as observers (Article 28).

Private Parties: These would be the individual member lines which trade jointly as Conferences, and their clients, the cargo shippers. They are defined in Chapter I of the Code and do not require any special comment. It would be expected that, in jurisdictions where the parties have no legal identity as such, necessary steps would be taken to rectify the matter.

Independent Parties: The panel of conciliators concerned with matters under Chapter VI of the Code would be an Independent body.

PROCESS OF IMPLEMENTATION

As noted earlier, one cannot generalize about the process of implementation for all Conference trades, all governments, or all appropriate authorities. Governments might first, independently, draw up the necessary legislative or other measures giving effect to the Code under Article 47, or would do so after prior consultation with affected Conferences and representative shippers.

Assuming that the necessary regulatory texts incorporating the Code have become operative, then presumably, depending upon the prevailing trend in a country, the governments, the Conferences, or the shippers, or the three parties together would convene the appropriate meetings to draw up the necessary Conferences and trade participation agreements, loyalty arrangements, and so forth. Members would, as they do now, meet

together, forecast and assess market prospects, allocate shares of cargo, set freights, consider questions of dispensation, but with this difference: that they would not do so arbitrarily or pursuant to the wishes of dominant "carrier" or other interests, but with the needs of shippers and of national and third-flag lines in mind, as required by the Code, through the process of consultation which the Code provides as the triggering and operative mechanism of the total implementation process. The "administration" of the Code in this manner should not ordinarily require the establishment of a cumbersome bureaucratic machinery. Even today Conferences are administered by executive bodies, administrators and secretaries. Existing machinery could thus be streamlined to operate the new regime. Clearly, too, it would be in the best overall interests of each country concerned that the Code be introduced with the least possible disruption of existing processes consonant with its provisions, and the maximum use made of existing machinery adapted so as to give the optimum effect to the Code. Under pressure by the different interests which had to be accommodated, the Code has been flexibly drafted to chart the course of the Code within manageable limits over existing Conference practices. It leaves sufficient discretion and room for negotiation to the contending parties, under the benign guidance of the governments affected to achieve its aims of seeing established an efficient and equitable operational regime for Conference trades in terms of the legitimate needs and concerns of shipping lines, shippers and of public policy considerations. So long, therefore, as the national enabling legislative texts do not consciously exceed the limits of the various provisions of the Code, and the consultative processes are used responsibly, I can see no long term problems. The governing national regulations would be expected to confer the basic protections which the Code provides to the parties, and if before the regulatory instruments are adopted, both Conference and shipper interests are consulted, future problems should be avoided. The Code's provisions are best construed as norms to be interpreted and applied as adaptable to the situations prevailing in the Conferences concerned. No legal instrument or body of rules in any case ever operates in a vacuum. Rules have to be interpreted and applied pragmatically by and to the parties to which they were intended to apply: that is, those human agencies or entities foreseen in the Code as being primarily affected by its operations, the Conferences, and shippers' representatives. Allegations of excesses may be raised at the five-yearly Review Conference, where, it is to be hoped, the experience from the various Conferences would lead to periodical improvement of the Code in accordance with changing times and views.

PUBLICLY REGULATED LINER CONFERENCES

The paradigm for such Conferences is the U.S.A.-type statutory regulation of inward and outward-bound U.S.

Conferences, whereby the FMC oversees their operations under the 1916 Shipping Act and subsequent amendments. Regulation in U.S. and similarly administered trades is generally affected through:

- (a) Supervision: Conference agreements and tariffs require approval.
- (b) Control: reports of conference meetings are submitted for information.
- (c) Prescription of Conduct:
 - (I) Prohibition or monitoring of certain restrictive practices, such as deferred rebates and discriminatory freights;
 - (II) Requirements of Conference agreements to include certain specific clauses assuring rights of Conference membership, shipper rights and policing of malpractices.
- (d) Governmental power on aspects of freight rates.
- (e) Governmental powers of investigation.
- (f) Judicial or quasi-judicial powers to disapprove Conference agreements and loyalty arrangements, and levy penalties, provide for suitable action on freight rates and other conditions of Conference services as authorized by legislation.
- (g) Machinery for adjudication: through normal legal channels and/or hearings before regulatory bodies.

Countries such as the U.S.A. which have statute law on their books affecting Conference operations face the dilemma that their system squares fully neither with the Code nor with self-regulated Conference services, which constitute some two-thirds of all Conferences. With the Code's entry into force, such countries will face two choices: either to continue as they are doing now, supporting the remaining one-third of all world Conferences, or to reach some sort of accommodation with the Code, since the Code and self-regulated Conferences appear to be coalescing. Countries where self-regulated Conferences operate do not face this dilemma, as they mostly acquiesce in Conference operations. Having no inconsistent legislation to circumvent, once a decision is taken to accept the Code, only the passing of enabling legislation, as earlier discussed, is necessary. U.S. shipping experts most often criticize the Code for eroding free competition in shipping. In my view that particular argument is a matter largely of semantics, since much depends on what the term "free competition" is taken to mean. It has not been possible, for the greater part of some one hundred years, to apply characterizations such as "free competition" accurately to liner shipping. Any strictures assuming or alleging that the Liner Code would introduce cargo-sharing or flag discrimination, or would precipitously subvert existing cargo-allocations or flows, is flawed ab initio, for the simple reason that liner shipping is not "free competition" oriented. Recent liner agreements approved by the FMC sanction cargo-sharing on a flag basis. Space charters, pooling and

"equal access" agreements are also countenanced, and not only do U.S. regulations permit dual-rate contracts for loyal and other shippers, but they also provide for a minimum notice period for freight-shippers, and a minimum freight-increase "freeze" period, establish criteria for freight rates, set overall parameters, and in fact do practically everything which the Code purports to do. Those differences that do exist, either qualitative or quantitative, are not in my view so radical as to be beyond reconciliation. So long as commentators pitch their analysis at a high level of abstraction, and speak of the Code as subverting "free competition" or proposing wholesale instant cargo re-allocations, largely imaginary difficulties will continue to be aired about the Code. As soon, however, as commentators descend to more mundane levels, examine how Conferences actually operate, how in fact cargo allocations are in practice made and changes effected, and how difficult it is for new maritime nations to acquire tonnage, and how long it takes them to do so, a less pessimistic and less strident element would be introduced into the current debate over the Code in international shipping. In fact, recently there have been moves within the U.S. bringing that country closer both to the Code and to self-regulated Conferences, and it is to be seen how events turn out.

One of the options I have also seen aired about future U.S. policy is the suggested conduct liner services by bilateral agreement. It is still perhaps too early to make judgments. I understand, however, that in several U.S. Conferences bilateral agreements form a fundamental element in their regulation, and comprise allocated trade-shares for U.S. flag vessels, the trading parties' flag vessels, and third-flag carriers. Thus, precedents exist for the combination of bilateral agreements and Conference services. One can only hope that the various problems which at present agitate operators and regulators in U.S.-type regulated Conferences will shortly be resolved. Clearly, what should be avoided at all costs is a situation where a contracting party state, at one end of a publicly regulated Conference, is faced with unbending opposition when it attempts to enforce the Code at its own end of that trade. Such a situation would mean a direct conflict under international law, which would have to be resolved either by litigation or hopefully through diplomatic negotiations.

OTHER ISSUES UNDER THE CODE

Membership: In most self-regulated Conferences membership is tightly controlled by Conferences, and there is neither a requirement that reasons be given for refusal, nor is recourse to an independent tribunal possible. The usual pleas for rejection, when given, are overtonnaging of a trade or alleged incapacity of the applicant line to adhere to Conference schedules and obligations. Under the Code national lines must furnish evidence of their ability and intention to operate regular, adequate and efficient services on a long-term basis

and to deposit a financial guarantee. In the case of "third-flag" lines, additional criteria include the taking into account of the existing volumes of the trade and prospects for its growth, adequacy of shipping space, probable effect of admissions on the efficiency and quality of the services, and current participation of the applicant line on the concerned route(s). A Conference refusing membership is required to give the grounds in writing, and to take into account the views of shippers, and of "appropriate authorities" if they so request. Recourse to the dispute settlement machinery of the Code is available to rejected applicants.

Trade Participation: Article 2 says that when determining the share of trade which member lines shall have the right to acquire, the following principles shall be observed regarding that right, unless otherwise agreed:

- (a) The national lines of two countries whose foreign trade carried by the Conference shall have equal rights to participate in the freight and volume of traffic generated by their mutual foreign trade and carried by the Conference.
- (b) Third-country shipping lines, if any, shall have the right to acquire a significant part (such as 20 percent) of the traffic generated by that trade. (Note: Under paragraph 9 trade-sharing agreements shall be reviewed by the Conference periodically, as agreed and stipulated in the Conference agreements; and under paragraph 10 a transition period of not longer than 2 years is provided for the application of the Article, taking into account the specific situation in each of the trades concerned).

There is no quantitative rigidity in these provisions, which are in the nature of guidelines and include the proviso "unless otherwise mutually agreed." Further, the contrast between such provisions and existing Conference practices must be examined in the light not of idealized free competition conditions, which do not, as a matter of fact, exist in the liner conference trades, but in light of those in actual practice. Conferences have shared out cargo since 1875, at first between lines of the same flag (initially British), and extended later to include Western European and U.S.A. lines, barring all applicants for membership which were not strong enough to mount and sustain competitive inroads into Conference trades long enough to make it cheaper to admit them as members. Conferences thus have more than a century's history of cargo-sharing behind them and already divide shares directly or indirectly by flag, by either percentage divisions of revenue or tonnage or by numbers of sailing, etc. Whatever method is used the final calculation can be worked out in percentages. There is also in many Conferences an escalation clause to raise shares of national or other lines. Cargo-division would, therefore, continue broadly on the same lines under the Code, except that, as a result of negotiation between the lines within the

parameters set by the Code, the general principle "unless otherwise agreed" would be 40/40/20. These figures are indicative only, and not rigidly imposed. Where existing cargo-allocations are near enough to the 40/40/20 ratio suggested, I would not expect any serious problems over re-allocation. The Code does not force countries to establish or expand their merchant fleets. It assists them through legal sanctions only if they so wish. "Problems" might, however, arise in trades where states with no or minimum cargo-shares may wish to maximize their acquisitions precipitately. These would, however, be rare or extreme cases, although critics rather tendentiously cite them as norms to be anticipated. We must accept that, should this happen, there would be a likelihood of temporary disruption of services. However, this would not be anything novel in Conference history, and the types of problems which arise as a result have been eventually resolved through negotiation and adaptation of the parties to new situations. The Code, based as it is on "meaningful" consultation, would not, therefore, constitute an unfamiliar forum for resolution of such problems. Breakdowns of this nature have occurred several times in the past in major Conferences. "Abolished" Conferences have survived and bitter commercial rivalries and struggles resolved, and there would appear to be no reason why under the Code the position would be any different. If anything, prospects for amicable resolution of problems would be brighter, since not only is consultation institutionalized under the Code but its dispute settlement machinery is also there to ensure that the clear norms of positive international law represented by the Code are there for the contending positions to be measured against -- something which does not exist at present.

A final point. Some countries whose lines are strong "cross-traders" feel either that they would have no shares under the Code, or would face dramatic cuts. The Code of course provides for the principle of third flag participation (such as 20 percent). Lines which would be worried would clearly be those whose participation is significantly in excess of this figure. As I understand the situation, third flag participation by single fleets is already decreasing in many of those relatively few trades where they have enjoyed such a status, for various reasons which include increasing competition by other third flag fleets, outsiders and national fleets. It should again be noted that shipping is not a static industry. A situation which may favour a particular line today cannot be expected, with or without the Code, to last indefinitely. Already, even without the Code, in most liner trades few single third flag carriers enjoy shares largely in excess of 20 to 30 percent of the traffic, and while it might be argued that this ratio would decrease with growing national trade interest in shipping, I do not believe it is in the cards that it would significantly increase, as it is quite a large undertaking for national lines effectively to carry around 40 percent or more of their national trade in all Conferences serving their national trades. Moreover, any third flag carrier which enjoys an

unusually large share (of the order from 40 to 60 percent, say) in a particular liner trade would be presumed to be operating a service where either the concerned national lines are uninterested in membership for their lines, or have not the capacity or will, for whatever reason, to increase their participation. This situation would not change overnight because of the Code. Should the national lines decide to participate or increase their share, equally clearly it would be a slow process, to which both they and the third flag carrier would have ample time to adjust. In either case, I cannot see that for this reason the entire Code should be condemned.

Shippers will not, therefore, face a novel situation under the Code. The Code does no more than confer an orderly framework upon cargo allocations, which were arbitrarily imposed historically through commercial primacy of private mercantile interests backed by paramount sovereign political power, but which would be replaced under the Code by equitable rights of carriage for fleets from exporting, importing and third flag States. This pattern of division is being increasingly accepted as a fair means of sharing trade even before the Code has entered into force, for example in several Asian, African and Western European trades, and most recently is understood to have formed the basis for negotiations being agreed between the U.S.A. and China. Shippers are used to utilizing Conference vessels of different flags under existing pooling and other cargo-sharing arrangements, and are accustomed to periodical flag or line shifting adjustments that are made. There is no reason why they should not as readily adapt under the Code to the new agreed allocations.

Consultation: Consultation takes place in diverse forms in most Conferences. In the Code consultation is a key Institutional and Implementative feature of Conference services. A non-exhaustive list of all the major areas of common interest in Conference operations is provided in Article 11. "Appropriate authorities" can, on request, participate fully in the consultation, without, however, playing a decision-making role. The parties involved are required to take account of each others' views and problems and to strive and reach agreements consistent with their commercial viability. Clearly, therefore, more effective consultation would result from enforcement of the Code, and in time largely satisfy current needs.

Freight Matters: Articles 12 through 17 cover freight rates including criteria for their determination, rules for notice on general freight rate increases, promotional freight rates, surcharges and currency changes. The provisions on promotional freights, surcharges and currency changes are self-explanatory and would not appear to call for special comment. Methods used by Conferences to determine freight rates are traditionally kept confidential. Criteria set out in the Code to contain freights at levels feasible from the commercial point of view, and affording reasonable profits to shipowners, while not placing arbitrary curbs upon Conference rating practices, introduce an element of accountability, which if effectuated

constructively should stabilize much of the existing uncertainty which prevails on liner freight level determination. The provision of criteria has been hotly contested by carrier interests from countries which voted against the Code, questioning their clarity or indeed soundness, although the EEC countries have not reserved their position in regard to the relevant freight Articles. On the other hand, proponents of the Code point to comparable formulations in several national legislative texts, which, while appearing on the surface to be imprecise or impractical, have apparently worked satisfactorily and not caused insuperable problems. The controversy illustrates the kind of thinking which frequently bedevils interpretation of legal texts. If a text is drafted on broad and general lines, its critics castigate its "vagueness" or "ambiguity". If it contains any "teeth", it is flayed for being too detailed or rigid. The only possible answer is the time-honored one: the text has been drafted by representatives of both shipper and carrier countries, and it must be assumed in fairness to them that they knew what they were doing when they drew up the provisions. We must leave it to the proper interpreters of the text -- shippers and Conferences -- to give it effective meaning.

In some Conferences, freight increases are peremptorily announced. In others, there is consultation, both prior to and, if the increases are disputed, subsequent to the announcement. The Code provides for notice of not less than 150 days of proposed increases, or according to regional practice and/or agreement. Consultation procedures addressed to proposed changes and referral of disputes to the dispute settlement machinery are also covered in the provisions. Conferences criticize the notice and "freeze" periods for their length, although these represent compromises with shipper interests and also provide for other "periods" to be agreed. If agreement is reached after consultations, even a later date for the taking into effect of the increase than that indicated in the notice period may be agreed by the parties. It is also provided that pending the conciliator's recommendation a general freight rate increase may be implemented by the Conference. My belief is that a disproportionate amount of time and energy is expended in Conference trades over the resolution of disputed freight rate increases. We must assume that those overwhelming numbers of states which adopted the Code -- those which signed it, and those which have become or will become contracting parties to it -- did or will do so in the sincere belief that with the greater order of accountability, which the Code will bring into the administration of Conferences and their relations with shippers and governments, the more contentious features of freight rate problems will gradually be eliminated or reduced.

Dispute Settlement: A fundamental need of developing countries was to have provisions in the Code for a viable dispute settlement machinery, to which either party could resort covering the whole range of disputes which can arise in Conference operations. Most existing Conferences have no such

provisions, at least in matters as membership, loyalty agreements, trade participation or freight. Usually both parties must agree to seek adjudication, and Conferences are not prone to do so in matters such as freight and surcharges, where they feel they should have the last word. Resort to courts of law is not helpful: first, because shippers who are usually the complainants have nearly always bound themselves by contract, which the courts would honour; and second, because the general run of disputes over membership, freight rates, dispensation to use non-Conference tonnage, and so forth, are not of a character which ordinarily lends itself to litigation. Initially, the majority of developing countries wanted a system of mandatory arbitration, and eventually the present system of mandatory conciliation put forward by the developed countries as a compromise solution was accepted, as the alternative would have been no provisions at all, which only the developed countries wanted.

While the system selected is not ideal, and permits the parties to agree to other lawful methods of dispute settlement, it is felt that under the circumstances further opinion be deferred until experience has been gained of its functioning. There is no other alternative at present, except having nothing at all

RESERVATIONS TO THE CODE

Two types of reservations have been made to the Code. Some countries have wished to exclude from its application bilateral Inter-Governmental shipping agreements, while in other cases, as for example, in a statement of intent by the EEC countries, specific reservations have been drawn to designated articles in the Code. The subject of Reservations is, of course, extremely important and requires careful study not least because it forms a highly technical component of treaty law. We have insufficient time to go into the subject in any great detail at this seminar, and I will confine myself to some salient points only. The Code itself is silent on Reservations, but I believe on present authority, taking into consideration particularly the provisions of the Vienna Convention on the Law of Treaties (1965), it is accepted that a State may formulate a Reservation unless it is incompatible with the object and purpose of a treaty; and that an objection by another Contracting Party to a Reservation does not preclude the entry into force of the treaty between the objecting and the Reserving State unless a contrary intention is definitely expressed by the objecting State.

We are in no position at this stage to judge the existing reservations. That would be for the Contracting Party States to do. Purely on a personal level, however, I feel that the position would eventually largely crystallize as follows:

- (1) The Reservations against bilateral intergovernmental agreements would not prima facie conflict with the Code for so long as the agreements referred to are those which

appertain to shipping services that are run at a government-to-government level and do not clash with Conference services in a particular trade.

- (2a) The main EEC Reservations would purport to disapply in Intra-EEC liner trades Article 2 on Trade Participation, Article 3 on Decision-Making Procedures, and Article 14(9) on General Freight Rate Increases, and reciprocally in Intra-EEC-OECD trades where OECD countries may also be Contracting Parties to the Code, allowing, however, shipping lines of developing countries to apply for participation as third country carriers in those trades. In my judgment, the language of the Articles to which the Reservations have been addressed, particularly Article 2, as we saw, is itself so flexible that the need for a Reservation hardly appears necessary. The Articles carry sufficient elasticity so as not to require the type of Reservation made. Secondly, the "classical" Conference-like arrangements hardly exist in the Intra-EEC "liner" trades, nor can one envisage developing-country fleets in the short term wishing to enter those trades. Should the non-EEC-OECD countries be brought within the scope of the Reservations, the position would become more complicated, admittedly, in that several developing country fleets and shippers are already participants in the relevant Conferences. I feel the principle that the Code is sufficiently elastic to do without the Reservations yet largely satisfy both the integrity of the particular Articles and the thrust of the relevant Reservations would nevertheless not thereby be disturbed.
- (2b) The same observations apply to the reservation by one country on Article 2 not to apply it.

Finally, as a general remark, I might mention that in the EEC Reservations, reference is made to "commercial" considerations being required for Conference membership qualifications, and in respect of freight matters, the implication being that the Code is not commercially oriented. The EEC has not defined what they mean by "commercial" considerations. However, a British Government Consultative document on the Code by implication characterizes commerciality by citing basically the very criteria which articles in the Code enunciate for membership qualification. Further, the provisions in the Code for determining freight while outlawing blatant profiteering are equally basically commercial and permit reasonable returns on investment.

Frankly speaking, therefore, I feel it is cutting the cake too fine to attempt to differentiate between what happens when lines meet together and divide cargo (according to their commercial "clout", capacity and will), and what would happen when they would do so under the aegis of the Code which attempts to give fair shares to lines of exporting, importing and third flag States under the 40/40/20 principle (i.e. no rigidity in percentage points) with a proviso for agreeing on other

principles. For these reasons, I do not believe that the existing Reservations at this stage are serious enough to "get steamed up over." We must await the practical operations of the Code before we may make our judgments.

CONCLUSIONS

I hope enough has been said to repudiate some of the more extreme criticisms that have been levelled against the Liner Code: that it will introduce cast-iron cargo-sharing and other disruptive devices into "freely competitive" liner trades; that freights will come to be imposed rigidly or frozen by unrealistic formulae; that innovative dispute settlement mechanisms will interrupt services; that only developing-country interests will be served by virtue of those countries having on their own "bloc-voted" the Code through the diplomatic Conference; that third-flag "cross" trading will be banned or reduced; that containerization and successful "outsider" competition has made the Code irrelevant or "obsolete"; and that an easy-flowing system is going to be run by unrealistic bureaucrats on the basis of laws drafted so haphazardly as to be too rigid or too vague for proper application.

I cannot, of course, claim to have resolved everybody's doubts. What the Code attempted to do was to appease those who found the extreme Conference practices no longer tolerable, and yet not alter the structure beyond what would be workable. Conferences could not expect to be legally free to opt out of their obligation under the Code, not to continue their traditional cartellistic practices without restraint. Analogous restraints also had to be placed upon shippers, and dispute settlement provisions were needed as a further safeguard against irresponsible behaviour. However, the concern for commercial flexibility must equally be respected. What was required was a sufficient degree of flexibility to be written into the appropriate articles of the Code which would enable Conferences and shippers not only to conduct their business under juridical sanctions but also to agree on reasonable restraints. The essence of the Code lies in the legal technique used to secure the required mix of "pliable rigidity" and "disciplined contractual freedom". This kind of balance offers the best of both worlds: the sanction of law under flexible norms permitting the parties to negotiate equitable rights of trade and operated agreed practices.

Seen in this light, the Liner Code can be said to have largely satisfied those interests which wanted rights and obligations established by sanction of law, and those which pressed for commercial flexibility.

Liner shipping is an important enough section of international trade to warrant a public policy framework, which by virtue of the U.N. Code may now be taken as established. It is no light matter that 56 countries have become contracting parties and that the EEC countries are about to become so. We must accept that that framework cannot, given the dynamic nature

of the ocean transport industry, be a static one. If the outlooks of 1875 are out of date today, certainly those of today will themselves become outdated in the years to come. For this reason, the adoption of the Code in 1974 needs to be looked at as but a further milestone in the search for orderly relationships in ocean transport, and not as an end in itself. Its in-built provisions for Five-Year Reviews drive the point further home that those relationships, for so long as the international community consider them viable and necessary, need to be kept under constant re-consideration with a view to making such further changes as experience may dictate.

I might add finally that the delay in giving effect to the Code has almost certainly led to the proliferation of national cargo reservation laws against which many maritime powers continue to protest so strongly. The same countries which protested against the Code, which attempts to restrict reservation of cargo within equitable limits, now protest against what they consider intemperate preferential legislation. It is frankly not at all clear what many of these countries want, since nothing appears to please them, and the days of free competition to which they hark back just do not exist in liner trades!

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SHIPPING REGULATION: THE CANADIAN APPROACH

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INTRODUCTION

At the outset I should emphasize that my comments which follow should not be construed in any way as the official Canadian position on the subject, and do not necessarily reflect the views of the Canadian Transport Commission or the Ministry of Transport.

In this presentation I should like to use a "mix" of selected legislative enactments and some very recent jurisprudence, both case law and comment. In this way I hope to be able to give a picture of current Canadian thinking about problems of shipping regulation, at least as seen by a lawyer who comes in daily contact with the subject.

NATIONAL TRANSPORTATION ACT

The Canadian Transport Commission was established in 1967 with passage of the National Transportation Act, Rev. Stats. Can. (1970), c. N-17. Two primary commitments led to its passage: competition and the incorporation under one roof, as it were, of the various modes of transport that come under federal jurisdiction. To that extent the legislation applies to transport by rail, air, water, motor vehicle, and commodity pipelines. The philosophy of greater competitive freedom contained in the National Transportation Act is reflected in one of the earliest substantive sections of the legislation, which sets out what is commonly viewed as the national transportation policy as follows:

"3. It is hereby declared that an economic, efficient and adequate transportation system making the best use of all available modes of transportation at the lowest total cost is essential to protect the interests of the users of transportation and to maintain the economic well-being and growth of Canada, and that these objectives are most likely to be achieved when all modes of transport are able to compete under conditions ensuring that having due regard to national policy and to legal and constitutional requirements.

- (a) regulation of all modes of transport will not be of such a nature as to restrict the ability of any mode of transport to compete freely with any other modes of transport;
- (b) each mode of transport, so far as practicable, bears a fair proportion of the real costs of the resources, facilities and services provided that

- mode of transport at public expense;
- (c) each mode of transport, so far as practicable, receives compensation for the resources, facilities and services that it is required to provide as an imposed public duty; and
 - (d) each mode of transport, so far as practicable, carries traffic to or from any point in Canada under tolls and conditions that do not constitute
 - (i) an unfair disadvantage in respect of any such traffic beyond that disadvantage inherent in the location or volume of the traffic, the scales of operation connected therewith or the type of traffic or service involved, or
 - (ii) an undue obstacle to the interchange of commodities between points in Canada or unreasonable discouragement to the development of primary or secondary industries to export trade in or from any region of Canada or to the movement of commodities through Canadian ports;

and this Act is enacted in accordance with and for the attainment of so much of these objectives as fall within the purview of subject matters under the jurisdiction of Parliament relating to transportation."

For the purposes of performing its duties under the National Transportation Act the Commission has established, among other Committees, the Water Transport Committee and International Transport Policy Committee, these being the two Committees I have been assigned to in my capacity as Senior Counsel with the Commission. In particular, the Water Transport Committee, in addition to responsibilities common to other modal Committees under the National Transportation Act, is also charged with the supervision of two other specific legislative enactments, the Shipping Conferences Exemption Act, 1979 and the Transport Act, as well as Regulation made by the Governor General in Council (i.e., the Cabinet), cited as the Coasting Trade Exemption Regulations, 1982-1983.

It may be of some interest if I were now to highlight some of the more relevant provisions.

Section 3: This section re-affirms the philosophy behind national transportation policy, that regulation of all modes of transport will not be such as to restrict the principle of greater competition among modes of transport;

Section 21: This section details a duty which is imposed upon the Commission as a whole to perform the functions vested in the Commission by the National Transportation Act and, in particular, insofar as the Water Transport Committee is concerned, the Transport Act, with the stated overall objective of coordinating and harmonizing the operations of all carriers

engaged in transport by the five modes of transport I have just referred to.

Section 23: This Section has been described, rather loosely, as a law unto itself. In this section of the Act, it is provided, for example, that where a person has reason to believe that an act or omission of a carrier (carrier having been defined as meaning "... any person engaged for hire or reward in transport, to which the legislative authority of the Parliament of Canada extends, by railway, water, aircraft, motor vehicle undertaking or commodity pipeline; ...") may prejudicially affect the public interest in respect of tolls for or the conditions of carriage of traffic within, into or from Canada, a person (person being defined by the Interpretation Act as including a corporation) has the right to apply to the Commission for leave to appeal such act or omission. If the Commission finds that such person has made a prima facie case relative to such act or omission as being prejudicial to the public interest, the Commission shall (emphasis added) make an investigation of such act, omission or rate and if, after a hearing, it finds that such act, omission or rate is in fact one that is prejudicial to the public interest, the Canadian Transport Commission may make an order directing the carrier to remove the prejudicial feature in the relevant toll or conditions specified for the carriage of traffic or such other order as the Commission deems proper. The Commission may, on the other hand, make a report to the Governor in Council for appropriate action.

Section 27: As you know, Mr. Chairman, this section of the National Transportation Act has received a great deal of attention over the past year and a half insofar as shipping matters in particular are concerned. I can truthfully say that the greater portion of my time as Commission Counsel during this period has been involved in such Section 27 matters as those affecting Canadian Pacific Limited and Dart Containerlines Limited, on the one hand, and Canadian National Railways and the CAST Group of Companies, on the other. Although I will return to these two specific cases shortly, I believe it to be sufficient, at this point, to describe this section of the National Transportation Act as one that provides a mechanism for the Water Transport Committee, in particular, to conduct an investigation, including the holding of public hearings, relative to an acquisition which either is proposed or has in fact taken place between a transportation company that is subject to the legislative jurisdiction of the Parliament of Canada (i.e., federal jurisdiction), and any person (i.e., corporation) whose business is transportation, whether or not this latter person is subject to the legislative jurisdiction of the Parliament of Canada. The catalyst that triggers such an investigation is the filing of an objection by any person on grounds that such acquisition will unduly restrict competition or otherwise be prejudicial to the public interest and, as a result of its investigation, the Commission may disallow such acquisition as being one that unduly restricts competition or is otherwise prejudicial to the public interest.

A very recent Decision of the Water Transport Committee in connection with the Canadian Pacific Limited and Dart Containerline Company Limited matter, to which I just made mention, notes that the investigation referred to is in the nature of a mandatory investigation, once an objection is made relative to an acquisition. Of significance is the fact that although the investigation is mandatory upon the filing of such an objection, there is no similar mandatory obligation imposed upon the Water Transport Committee to hold a public hearing during the Committee's investigation of the acquisition. Although it could be argued that in the majority of cases the Water Transport Committee will hold a public hearing, this proposition does not in any way detract from the Committee's position that the holding of a hearing is not obligatory. This whole matter was the subject of judicial comment by Mr. Justice LeDain, who is a Judge of our Federal Court of Appeal, in the case of Seafarers International Union of Canada v. Canadian National Railway Company, (1976) C.T.C., 90 "The statutory right of objection and the statutory duty of investigation in the present case appear to be rather different in their essential nature. The Commission clearly has a discretion as to the kind of investigation it will make in a particular case and whether it will hold any public hearing at all ..."

As I have mentioned, the greater portion of my time recently has been spent on a consideration of Section 27 matters, including as well the Canadian National and CAST Group of Companies acquisitions. This particular matter involved an acquisition in 1980 by Canadian National Railway Company of preference shares of EuroCanadian Shipholdings Limited, which has been described as a holding and investment company incorporated under the laws of Bermuda. To bring the matter into perspective, I might briefly mention that in 1975 Canadian National had previously acquired an 18 percent interest in the issued shares of the sole class in the capital stock of EuroCanadian Shipholdings Limited and InterCast S.A. (i.e., the CAST Group of Companies). At that time, Canadian National gave notice under Section 27 of the National Transportation Act and the Commission subsequently gave public notice of the proposed acquisition. Objections were subsequently filed and after completion of its investigation, which included the holding of a public hearing, the Water Transport Committee decided not to disallow the proposed acquisition. As I have just noted, in 1980 Canadian National acquired certain preference shares in the CAST Group of Companies, but did not follow the same procedure it adopted in 1975 by giving notice to the Water Transport Committee of such acquisitions, but rather Canadian National adopted the position that an acquisition of the preference shares was not of the kind referred to in Section 27 of the National Transportation Act, and therefore there was no requirement for the giving of a notice regarding such acquisitions.

The Water Transport Committee subsequently issued a Decision taking issue with Canadian National's assertion that this was not a matter coming within the scope of Section 27 and after considering and disposing of arguments advanced by Canadian National to support the Company's position that the acquisition of preference shares was not one to which Section 27 applied, the Committee found that it was an acquisition, at least indirectly, of an interest in the CAST Group of Companies, and Canadian National had to give notice as required under Section 27. This led to the filing of objections, which clothed the Committee with jurisdiction to conduct its investigation of such acquisitions. It may be of interest to note that the Federal Court of Appeal has recently upheld the decision of the Water Transport Committee regarding such acquisitions, and, at the time of writing this paper, it appears that decision is to be appealed to the Supreme Court of Canada.

Before I complete my remarks relative to Section 27, it may be of some interest if I relate how an interpretation of one consideration of Section 27 had the effect of setting the stage for the consideration of similar matters under the broad heading of "regulation". Some time ago, a question was posed whether a company that was not incorporated in Canada and was not a company engaged in water transportation to which the legislative jurisdiction of the Parliament of Canada extended, was obliged to give notice of such acquisition as being one that fell within the scope of Section 27 of the National Transportation Act. The acquiring company did, in fact, conduct a water transportation operation or business in Canada and, consequently, could be viewed as at least having a presence in this country, although technically not incorporated and not having an office here in Canada. It was the Water Transport Committee's view that such an interpretation could be accorded Section 27, and the argument is now advanced that as long as the acquiring company has at least a presence in Canada, Section 27 ought to apply to proposed acquisitions where similar cases may arise. This attitude has apparently found favour with persons who carry on such water transport operations.

COASTING TRADE EXEMPTION REGULATIONS, 1982-83

These regulations exempt certain ships engaged in the coasting trade of Canada from the provisions of Part XV of the Canada Shipping Act. The general intent is to allow foreign vessels to participate in the coasting trade of Canada, when no suitable eligible Canadian vessels are available.

The regulation of this aspect of Canada's coasting trade is found in Part XV of the Canada Shipping Act which has, as its title, "Coasting Trade of Canada". Section 661 of the Canada Shipping Act provides in part, as follows:

"661. (1) No foreign-built British ship, whether registered in Canada or elsewhere, after the 1st day of September 1902, is entitled to engage or take part

In the coasting trade of Canada unless it has first obtained a license for that purpose, which may be granted by the Minister of National Revenue, and if any such ship so engages or takes part without first obtaining such license it is liable to a fine not exceeding five hundred dollars for each voyage made by it in contravention of this section and may be detained by the collector of customs at any port or place in Canada where it may be found until such fine is paid; and the making of a single voyage in the coasting trade of Canada shall be deemed to be, within the meaning of this Part, the engaging or taking part in that trade."

Part XV of the Canada Shipping Act goes on further under Section 622 to provide that the Minister of National Revenue shall issue a license to such foreign built British ship upon application being made and payment of a duty calculated at the rate of 25 percent ad valorem on the fair market value of its hull, machinery, furniture and appurtenances.

Other sections of Part XV of the Act provide that no goods are to be transported by water, or by land and water, in any ship other than a British ship ("British ship" having been defined in the Interpretation section of the Act as including a Canadian ship); in other words, "British ships" under the provisions of the Canada Shipping Act are the only ones that may engage in the coasting trade in Canada.

As noted above, the Coasting Trade Exemption Regulations 1982-83 provide exemptions to certain ships that are engaged in the coasting trade of Canada from such provisions of Part XV of the Canada Shipping Act. As is contained in the declaration portion of such Regulations, it is provided that Part XV of the Canada Shipping Act shall not, for the period of April 1, 1982 to March 31, 1983, apply throughout Canada to a ship or vessel of any foreign country;

"(a) that is a ship or vessel described in the schedule and

"(b) that is proposed to engage in the coasting trade of Canada in an operation approved by the Minister of National Revenue, where the Water Transport Committee of the Canadian Transport Commission has advised the Minister of National Revenue, in writing, that a diligent search has revealed no suitable Canadian ship or vessel available for the proposed engagement."

The schedule, which is part of the Regulations, lists 10 classes of ship or vessel which comprise the following:

1. Barge
2. Tug
3. Container carrier
4. Ferry

5. Passenger vessel
6. Roll-on, roll-off vessel
7. Supply vessel
8. Tanker
9. General cargo vessel
10. Bulk carrier

Insofar as the Water Transport Committee of the Commission is concerned, a diligent search is conducted by it upon receipt of applications made to the Minister of National Revenue for waivers under Part XV of the Canada Shipping Act. Such a search entails a thorough review of its records in order to search out whether a suitable Canadian ship or vessel is available for a proposed engagement. If no suitable Canadian ship or vessel can be located, the Water Transportation Committee so advises the Minister of National Revenue by way of a written communication to that effect.

It may be of some interest to observe that in the majority of applications for waivers under the Canada Shipping Act considered by the Water Transport Committee, no suitable Canadian ship or vessel is usually found. For example,

1979 - 89 Applications	10 Denied
1980 - 100 Applications	12 Denied
1981 - 65 Applications	6 Denied

SHIPPING CONFERENCES EXEMPTION ACT, 1979

The Shipping Conferences Exemption Act, 1979, being an Act to exempt certain shipping conference practices from the provisions of the Combines Investigation Act, gives ocean shipping lines the ability to make agreements that are, in reality, anti-competitive. Although no regulatory system was created, due to the international flavour of the businesses involved, the legislation contains its own expiration date. The Act contains, among its provisions, an interesting example of "regulation" by way of the mandatory requirement, imposed upon members of a shipping conference, to meet with a "shipper group", as defined in the Act, when reasonably requested to do so by such group. There is also an obligation to provide to such "shipper group" information sufficient for the satisfactory conduct of the meeting. The "shipper group" is in fact one that has been designated by the Minister of Transport as representing the interests of shippers and comprises the body known as "The Canadian Shippers Council". The Council comprises groups of associations of corporate and constituent members representing approximately 15,000 companies. In my capacity as Senior Commission Counsel, I have been directly involved for the past two years in discussions between the "shipper group" and the Water Transport Committee over the problem of bunker surcharges and associated costs. A seven-step procedure to be followed by the Shippers Council was adopted early on in the initial stages, commencing with a written request for a meeting between the

Council and a shipping Conference up to the seventh step of a request lodged by the Council with the Water Transport Committee to have the Committee assist the Council to secure the required information. Although a meeting has not yet been arranged between the Shippers Council and members of a shipping Conference, it is anticipated that the specific problem regarding bunker surcharges will be fully and satisfactorily explored before too long.

The legislation also provides for the making of rather sweeping regulations by the Governor in Council that would require members of a shipping Conference to produce information of a type that would be specified in such regulations. This information is of a type that may reasonably be regarded as necessary to enable the Commission's Water Transport Committee to supervise effectively the activities related to a Conference in Canada, or to members of a shipping Conference. To date, no such regulations have been enacted, nor to my knowledge are any being contemplated. The potential for regulatory control is, nevertheless, clearly evident, although quite obviously the prevailing attitude is not to take advantage of the legislation.

There is also provision in this legislation that the Director of Investigation and Research appointed under the Combines Investigation Act may, on his own initiative, and shall, on direction from the Minister of Consumer and Corporate Affairs or at the request of the Restrictive Trade Practices Commission, carry out an inquiry concerning the operations of any shipping Conference and the effect that practices of the Conferences have in limiting facilities for the transportation of goods, or the preventing or lessening of competition in the transportation of any goods, or restraining or injuring trade or commerce in relation to any goods relative thereto. It would seem, therefore, that Parliament, although content to make the Commission responsible for the administration of the legislation -- which, for all practical purposes, means the filing of various documents with the Water Transport Committee (in 1981 approximately 30,000 documents were filed) -- would prefer that the Director of Investigation and Research be the party responsible for any investigation of a shipping Conference.

TRANSPORT ACT

The Water Transport Committee administers this particular legislative enactment, which, in general terms, governs the transport of goods or passengers by means of licensing procedures and tariff approvals. Under this Act, the Water Transport Committee may license ships to transport passengers or goods, or both passengers and goods, from a port or place in Canada to another port or place in Canada, upon being satisfied that the proposed service is and will be required by the present and future public convenience and necessity. The Commission may take into consideration various criteria to determine whether public convenience and necessity requires the licensing of such transport:

- (a) an objection to an application for a license that may be made by an existing carrier that suitable transport facilities already exist, or if such licenses be granted that they would be in excess of such transport facilities;
- (b) whether issuance of a license would tend to develop the complementary rather than the competitive functions of different forms of transport;
- (c) the general effect on other transport services that may be affected by the issuance of such license;
- (d) the quality and permanence of the service applied for and, of particular importance, the financial responsibility of the applicant.

The extent of the Committee's regulation under the Transport Act is confined primarily to the annual review by it of applications for licenses to transport goods on the Mackenzie River from Hay River in the Canadian Western Arctic to Tuktoyaktuk on the Beaufort Sea, as well as the Western Arctic and ports or places on the Great Lakes. Licenses for the transport of goods by water are issued on a yearly basis only. Serious consideration has been given recently to the issuance of such licenses for another period beyond the one year term, but such an extension may only be granted by the Commission with the approval of the Governor in Council. All in all, the Water Transport Committee adopts a somewhat aggressive approach to the regulation of carriers under the Transport Act, considering not only the particular grounds advanced in any application for a water license, but also such other related matters as the general economic activity forecast for the area intended to be served, the effect of low water levels on shipping operations generally, and the effect of competition relative to the general intent of providing adequate service to the public.

This question of competition on the Mackenzie River was specifically addressed in the inquiry conducted by the Water Transport Committee in 1977, at which the Committee reached the conclusion that "under the presently foreseeable commercial circumstances existing on the Mackenzie, 'perfect competition' in its normally accepted sense is unworkable, and the broad demand for transportation services should, as a first alternative at least, be provided by one general carrier on any particular route." In general, the Committee adopts the same approach today in 1982 as it did in 1978, in determining that, in its approach to regulation of shipping services on the Mackenzie River, "perfect competition", as the term is generally understood, is workable. This attitude of regulatory control by the Committee relative to the discharge of its responsibility by virtue of the Transport Act has been recognized as having been, at the very least, moderately successful.

In conclusion, it might be useful to quote the views of the Water Transport Committee as given recently in its report on the Mackenzie River inquiry, since it summarizes many of the elements present in current Canadian thinking about shipping regulatory policy in general:

Traditionally and historically the economic regulation of various modes of transportation has been adopted to make available to the public, on a continuing basis, adequate and reliable transportation services at the lowest possible rate commensurate with maintaining a vigorous, efficient and viable transportation industry. The evils intended to be avoided or cured by the imposition of economic regulation are firstly, the chaos, unreliability or non-availability of service resulting from uncontrolled competition, secondly, the risk of unduly high pricing fixed by monopolistic carriers, and thirdly, the waste and inefficiencies which frequently accompany the proliferation of carriers in a dynamic and growing mode. Examples of the first two evils were experienced in the air mode in Canada in the years leading up to the Second World War when, over a period of some years, air operators appeared and disappeared at very short intervals without creating or operating any reliable networks of air services. This was followed by the gradual acquisition of the numerous small carriers by one dominant carrier, an experience which led to the creation of the Air Transport Board. The third evil, waste and inefficiency, is demonstrated by the proliferation of rail services in Canada, Great Britain and elsewhere at the opening of the railway era, when a large number of lines competed for the available traffic with wasteful duplication of capital costs for rights-of-way trackage, running stock, etc., all of which costs fell eventually to the account of the users of the service. In Canada only two dominant rail carriers remain.

Commercial regulation normally takes the form of control firstly, of entry into the regulated industry, and secondly, of levels of service provided by, and of rates and charges imposed by, carriers already licensed. An adequate regulatory system, efficiently administered, should result in availability to the public of adequate service, at reasonable rates, in accordance with the licensing authority granted, to all who need it.

THE IMO -- PRIVATE
INTERNATIONAL LAW AND REGULATION

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I have a penchant for trivia which is going to take us on a slight "deviation" before we get down to the matter at hand.

The home town, which I have loved since my childhood and where my own children have been born, is almost exactly 250 nautical miles away, almost exactly due west of Halifax. That serene and beautiful coastal town of Castine, Maine has had a wonderfully turbulent history. In its first 150 years of existence it was a hotly contested strategic post; at one time or another five nations have claimed sovereignty over it. It was a principal location for the organization of Indian raids in the 1600's and during the 'French and Indian War,' and its last great appearance on the stage of history was in what is referred to in the United States as the War of 1812 -- more frequently referred to here and in the U.K. as the 'Second War of the Rebellion.'

When the British landed at Castine in 1814, unofficial history has it that this, still quite thoroughly Tory, town sent out its representatives in 'bum boats' to greet the British fleet, over 30 years after the First War of the Revolution. But, in any case, Brig. Gen. Gerard Gosselin and his troops came ashore; without difficulty they occupied the Town and Fort George, and the Custom House was also taken over by the British forces.

One of the historic figures of Canada, Lt. Gen. Sir John Sherbrooke, the then Governor-General, appointed a Collector of the Custom at Castine. It was still one of the largest commercial ports in North America -- in the early 1700's it was easily as large as Boston, something that is almost impossible to believe today. The collections from that Custom House in Castine were, in relative terms, tremendous sums of money, and Sir John Sherbrooke in his wisdom applied for and obtained from London consent that half of the fees collected at the Custom House would be used to found an institution of higher learning in His Majesty's dominions in North America. The collections made from that little Custom House in Castine founded that institution; and it is today Dalhousie University [1].

The meeting that we have here in Halifax does come at an historic juncture in maritime history, but not only because of the completion of substantive work on the Law of the Sea Convention. At the same time that the Caracas meeting was taking place in 1974, merchant shipping began a precipitous decline in fortune. As we meet today, merchant shipping is in the worst depression in living memory. Some of you -- apropos of remarks made yesterday from a number of points of view -- may be asking yourselves how your own political or economic

philosophy can be brought to bear on this sad state of affairs, but paraphrasing Rhett Butler, "frankly my dears, I don't give a damn."

The issues are too real and too urgent to be subjected now to much philosophical analysis. I think if in 1973, at the MARPOL conference in London, predictions had been made of what the economic effect of the MARPOL Convention could be on merchant shipping, and particularly on tank ship operations, these would have been ridiculed. But we have seen by this date at least half a dozen tankers -- VLCC's and ULCC's -- delivered as newbuildings and gone directly from the shipyard into lay-up, and at least six have then gone from lay-up to the breakers without ever having sailed an oil voyage. There could be no more vivid illustration of the depth of the current depression than that. One of the crucial reasons for making that decision is that the value of an ULCC a few years ago of 80 million dollars at delivery has sunk now in the present market to below 10 million dollars. The cost of converting a tank vessel to comply with the requirements of the MARPOL Convention will at present vary from an excess of 2 million dollars for a VLCC to possibly as much as 4 million dollars in the case of an ULCC. That renders that vessel not only uneconomic now but uneconomic for the future. The only rational decision to make, therefore, is to scrap it!

I hasten to say that it is not the MARPOL Convention which has caused this phenomenon, but there is no doubt that the impact of the MARPOL Regulations has been the deciding factor in a large number of accelerated scrappings, including those of newbuildings and 'young' ships. That is easily documented. At the same time, of course, we have the results of national regulation in the depressed market also being felt. For example, in the Soviet Union, where planning for construction of dry bulk carriers has been predicated for some years on an agricultural plan under which the Soviet Union would produce vastly more grain than it has in the past, poor harvests of the last couple of years have forced the Soviets to charter in foreign-flag bulk carriers. The dry bulk market is not in as bad shape as the tanker market, and charter rates are higher for bulk carriers. So the very hard battle fought in other areas of merchant shipping to acquire, even at a loss, hard Western currency, has under the current circumstances been set back by national regulation, which now forces the Soviets not only to lay out Western currency for the purchase of foreign grain, but also for the chartering-in of foreign bulk carriers to bring it to the Soviet Union.

In agreeing to talk on the topic of "Private International Law and Regulation," even in the context of the work of the International Maritime Organization, I undertook to defy a hallowed principle of classical international law. In theory, of course, private law cannot be regulatory; that is supposed to be the exclusive province of public law. But it is a fact that private law can in certain areas regulate very effectively, in a manner analogous to Adam Smith's "invisible hand." What I will

address, therefore, is in the truest sense the "Economics of Regulation". I shall try to leave the politics out.

Before we come to the core of the matter, I should refer to the work of the IMO in the private law field. It is of course the Legal Committee of the IMO, of which I have had the honor to serve for six years as Vice-Chairman and now for over two years as Chairman, which is exclusively responsible for the formulation of private law instruments within the Organization. The Committee has, of course, undertaken work in the public law area as well, perhaps the most notable examples being the 1969 Intervention Convention and certain portions of the 1973 MARPOL Convention. But the Committee's work has been largely in the private law area and has been principally concerned with liability, limitation and compensation arising out of marine losses and damage.

The "Constitution" of the IMO -- its Convention -- is sufficiently broad in scope to enable the Legal Committee to take up virtually any subject connected with maritime law. Although this Constitution specifically empowers the Organization to take up matters, and if necessary to fashion international instruments related to discriminatory action and restraint of seaborne trade [2], in practice the Legal Committee has devoted its time to subjects which have at least an indirect relation to maritime safety and environmental protection. This is true even of the 1974 Athens Convention on Passengers and Luggage, although the relationship there is the most tenuous to date.

The Legal Committee is one of the three statutory committees of the Organization. It can be easily demonstrated that the Legal Committee is the hardest-working committee of IMO. Lawyers being lawyers, we meet far more frequently than either of the other two committees. The Maritime Safety Committee and the Council of the IMO have been in existence since the inception of the Organization in 1959. The Maritime Safety Committee (or MSC) has recently completed its 46th Session, and the Council has only last week completed its 48th Session. The Legal Committee has been in existence only since 1968, and it will convene its 49th Session in October.

The two Conventions which best illustrate the differences in regulatory approach between public law and private law came 'before the flood', and were concluded at the first diplomatic legal conference under the aegis of the IMO, in 1969. The first of these instruments, the 1969 Intervention Convention [3], is an example of direct regulation by public law. The Convention imposes rights and obligations upon states, with a clear "penalty" clause imposing liability for overzealousness and excessive force by a coastal State. Indeed, the Intervention Convention contains specific measures for conciliation and arbitration of such claims against the coastal state [4]. The Intervention Convention is a bold regulatory instrument.

Its sister convention, the 1969 Civil Liability Convention [5] is easily classifiable as a private law instrument. It both imposes liability and sets limits upon recovery for oil

pollution damage. Thus this Convention deals with matters which lie at the very heart of private law. However, in its requirement that each vessel to which the Convention applies be compulsorily insured, and carry a certificate issued by the flag state and evidencing that the compulsory insurance is in force [6], the Civil Liability Convention (CLC) is, in part, openly regulatory.

The Intervention Convention was fashioned to meet the objection of a number of states that the action taken by the British government in 1967, when it bombed the stranded Torrey Canyon, was ultra vires the law of the sea. Despite the maintenance of an opposite view by some states (and, I must say, most particularly by Canada), it was the view of the majority of states then members of the IMO that a convention was necessary to establish clearly the right of the coastal state to act with force on the high seas in order to protect its coastline and related interests [7]. But whatever the merits of the relative positions regarding a right in customary international law to intervene in such cases, it is certainly clear that, in the absence of new conventional international law, there would be no assured right of compensation for the use of excessive force by the intervening coastal state -- or, in the language of the Intervention Convention, 'disproportionate measures' [8].

In the case of the Civil Liability Convention, it is not the threat of liability itself which is a deterrent to oil spills, nor is it the regulatory requirement that the carrier be compelled to obtain insurance to cover his liability. Rather, the CLC's deterrent lies in the imposition of strict liability, with exoneration available only under the most restricted circumstances, such as act of God or fault of another, and the very much higher limit of liability as compared with the 1957 Brussels Limitation Convention, and finally the consequent increase in premium rates which would inevitably result from unfavorable experience with the CLC liability provisions by the protection and indemnity (P & I) insurance market.

I want to make it plain that I am not asserting any superiority of result, or even of effect, when regulation is indirect by exposure to strict liability under private law, as against the direct regulation of public law. But private law instruments clearly do have a regulatory effect in that they deter acts which threaten the safety of life and property at sea or the marine environment; and it is interesting to note that the only sanction which is ever embodied in maritime public law conventions for violation of the regulation that they impose is in fact civil liability. It is never even hinted (the Law of the Sea Convention excepted) that states should impose other penalties for violation, although some states in their national law implementing public law regulatory conventions have, in certain instances, provided criminal in addition to civil penalties. To the extent that the Athens Convention on Passengers and Luggage [9] and the newly-completed draft Convention on Liability and Compensation in Connection with the Carriage of Hazardous and Noxious Substances by Sea [10] (the

"HNS" Convention) provide stricter liability, or higher limitation than that of the general maritime law [11], they too are indirectly regulatory private law instruments.

In the future work program of the IMO Legal Committee, the likelihood seems to be that we will increasingly find public and private law components within the same instrument. An example of this in nearly equal proportions is the forthcoming draft Salvage Convention. Although the Legal Committee has not yet begun work on the draft prepared by the Comité Maritime International (the CMI) [12], it appears to me that the eventual product will clearly and directly regulate the conduct of coastal states and salvors, and will also deal with liability and compensation arising out of salvage services.

At its 40th Session in 1979, the Legal Committee established the framework for its future efforts toward a comprehensive review of the law of salvage, looking to the eventual formulation of a draft convention covering all aspects, under the general agenda heading of "Matters Arising Out of the Amoco Cadiz Disaster." The Legal Committee recognized that work was already in progress then under the sponsorship of the Committee of Lloyds to revise the standard open form salvage agreement, and that the CMI had offered to undertake work relating to a new draft Salvage Convention. The Legal Committee decided to leave to these two bodies the formulation of the respective agreement and draft, but in its remit stated specifically that with regard to work done outside the Legal Committee "such a review would not encompass questions of coastal State intervention or the control of salvage operations by public authorities in the context of intervention" [13]. When the Legal Committee begins its substantive work on salvage (which now appears unlikely before 1984), it will address these public law issues as well as the private law work done by Lloyd's and the CMI. In all likelihood, what will eventually emerge is a new regime, in either a single convention or in two "sister" conventions, which will regulate mandatory salvage in the context of intervention by coastal states, will deal with compensation to salvors by coastal states arising out of the conduct of mandatory salvage operations, and will also deal with liability and possibly compensation for salvage in the private context.

In keeping with the most recent decision of the General Assembly of the IMO [14], the Legal Committee has on its agenda for future work beyond the law of salvage seven "definite" items and two "possible" items [15]. Although the last of these "possible" items is multiple -- that is, "review of the CMI Brussels Conventions with a view to their being replaced by updated conventions under the auspices of the IMO" -- I daresay that the first seven items on the list could easily occupy the Legal Committee's full attention for the next decade. It is certain that there will be substantial revision to this list as well as revision of the order of priorities in the present list as time goes by. Certain of these items on the future work program of the Legal Committee have, again, mixed public and

private law implications. That is obviously the case with wreck removal and arrest of sea-going ships. The matter of arrest of sea-going ships, in particular, is one to which the Organization attaches great importance, and it is expected that an upward shift in priority for this item will be forthcoming shortly.

In closing -- and I have been uncharacteristically brief in order to allow more time for questions -- I should say that the Legal Committee is very much aware of the regulatory impact of private law in the maritime field. Its work on private law instruments is consciously and deliberately oriented towards a regulatory effect, and the regulatory impact of draft provisions is commonly discussed in the course of debates within the Committee. I think it is by now obvious to us all, especially in light of the "umbrella" provisions of the Law of the Sea Convention, that the trend is increasingly toward direct regulation by international public law. 1983 ought to be a banner year for such direct regulation, for it is virtually certain that the STCW Convention will enter into force then, and it now seems probable that the MARPOL Convention will also enter into force next year.

At the same time, I am convinced that in an industry in which the commercial impact of decisions regarding operation of vessels is weighed on a daily basis, and in which the ever-growing and increasingly confusing body of mandatory regulation is left to "experts" within shipping organizations who do not make commercial operational decisions, the regulatory effect of private law is in fact a greater influence, and a growing influence, upon the formulation of operational decisions, and those are the decisions which have the most direct consequences for safety of life and property at sea and for protection of the marine environment.

NOTES

1. Calendar of Dalhousie College and University, 1888-89.
2. Convention on the International Maritime Organization, Article 1, Paragraphs (b) and (c).
3. International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969.
4. Article VI; Annex, Chapters I and II.
5. International Convention on Civil Liability for Oil Pollution Damage, 1969.
6. Article VII.
7. The Intervention Convention was first invoked only months after it entered into force -- by the United States in the case of the Argo Merchant, in December 1976.
8. Article V, Paragraph 1.
9. Athens Convention Relating to the Carriage of Passengers and their Luggage by Sea, 1974.
10. Document IMO LEG 47/7, Annex 2, March 12, 1982.

11. Articles 3, 4, 6, and 7.
12. Document CMI Montreal II, 1981.
13. Document IMO LEG XL/5, Paragraph 62.
14. Document IMO A XII/5(b)/2, Annex 11, page 4.
15. "LEGAL COMMITTEE

1. Draft convention on civil jurisdiction, choice of law, recognition and enforcement of judgements in matters of collision at sea;
2. Draft convention on offshore mobile craft;
3. Consideration of the legal status of novel types of craft, such as air-cushion vehicles, operating in the marine environment;
4. A possible convention on wreck removal and related issues;
5. A possible convention on the regime of vessels in foreign ports;
6. Arrest of sea-going ships;
7. Legal status of Ocean Data Acquisition Systems (ODAS);
8. Possible review of the 1926 Brussels Convention for the Unification of Certain Rules Relating to Maritime Liens and Mortgages, and the 1967 revision thereof;
9. Possible review of the CMI Brussels Conventions with a view to their being replaced by updated conventions under the auspices of IMCO."

DISCUSSION AND QUESTIONS

ERNST FRANKEL: I was very interested in Professor Abrahamsson's discussion of social regulation; but I believe that regulation really has to be divided into a merry-go-round of social regulation, economic regulation, operational regulation, technical regulation, and administrative regulation, all of which chase each other. At M.I.T. we have recently made a study of administrative regulation, in particular shipping documentation requirements for the Department of Transportation in the United States, and we came to some fascinating results. In the United States in 1980 a total of 1.2 billion manhours were spent generating shipping documentation unrelated to operational requirements at a cost of \$18 billion, which constitutes 7.8 percent of the value of U.S. foreign trade. We furthermore found in querying various users or generators of the requirements for documentation that less than 10 percent of the information supplied in that documentation had any role to play in their decision-making. Furthermore, 95 percent of the 10 percent that were actually used were identical in all the documents -- 58 in total.

Coming to other comments Professor Abrahamsson made, I would like to ask a question about the Tonnage Convention and its potential impact on the future allocation of ship spaces, particularly machinery and other ship service spaces. Regarding the Training Convention, I wonder what the impact of changing technology and of the increasing complexity of ships will be on future training requirements. Furthermore, will the increasingly reduced manning employed on our seagoing ships require a much higher degree of training of the so-called unlicensed personnel? I would hope that in the future we require licenses of some sort, or certificates of competency, from all ship schools.

On the topic of the Code of Conduct, I am in total agreement with the objectives of the Code, particularly with regard to the increase in LDC liner shipping capacity. But with regard to the comments that were made by various speakers on the objective of introducing order into liner shipping and reduction of inequities, I have some very serious questions. One might, for example, question the effect of the Code on the cost or the efficiency of liner operations. One might also question the underlying concept of national shipping. Many of our conventions or regulations suffer from the lack of specificity, largely because the operators, the users, are very often not involved in the drafting. "National shipping" can be interpreted in many ways. Although the Code is not yet in force, those countries which have already started to apply its provisions have interpreted national shipping in a variety of ways, and in ways which will be counter to the basic objective of increasing LDC shipping. A significant number interpret national shipping as essentially any shipping capacity under the control of that particular country. So space chartered,

chartered, or any other type of capacity under the temporary control of this particular nation, is classified as national shipping capacity. Now this has a number of impacts. One of the impacts is increased cost of shipping, because the liner operator who charters or space charters some of his capacity to a particular country, in order to allow this country to carry its share under the cargo sharing interpretation, obviously charges the same as he would usually charge for the same capacity and the particular country adds a fee, or its national shipping company adds a fee. Accordingly, as we have noticed in a number of studies, the freight rates have increased significantly.

A number of subterfuges have recently cropped up. Joint venturing, for example, where one nation joint ventures its national shipping company with the shipping company of a smaller LDC country one way only, so that their ship sails under the banner of their national flag one way but changes affiliation on the return leg. Another example of subterfuge is obviously cargo diversion. Shipping out of Southeast Asia or in Southeast Asia, for example, is greatly affected by diversion of cargo through various ports. It's not effectively defined what a particular cargo share implies when diversion or trans-shipment is used. At M.I.T. we have been asked to make a study of the most effective or optimum diversion or trans-shipment system for the Asian countries that will allow them to maximum the benefits to the region. Cargo sharing under the Code really implies closed Conferences. Under most interpretations non-Conference participation is likely to be eliminated.

Finally, a comment on the exclusion of government owned cargos. I was always amused at meetings to see how our Eastern European friends were so wedded to the Code until I found out that by the exclusion of government owned cargos they excluded themselves from the application of the Code in toto. It's very easy for people to be in agreement with a proposal if they are not affected at all by it. Although this Code is largely designed to protect shippers, some of the major proponents of the Code are countries in which the vast majority of general cargo or liner trade is generated or imported by agencies that own their own shipping.

BERNHARD ABRAHAMSSON: You have studied these questions more than I have, but let me try to answer some of them. Let me start with the last one first because I think I can dismiss that one rather quickly. You said that the Code was chiefly designed for the shippers' protection, but I don't think that it really is quite so clear-cut. If you look at the participants in the UNCTAD negotiations for the Code, the shipowners have been extremely conspicuous. In the process they have, of course, talked about the shippers' interests, but the shippers' interests have not been the only focus. I think it has been primarily a matter of building up LDC shipping capacity. Whether that's good or bad I'm not quite sure either, but let me leave that aside now.

Let me go back to the first question about technological progress, training, and regulation. The U.S. Coast Guard -- and that's where I have to fall back, because that's what I have been looking into -- definitely changes its rules and regulations in the light of proven automation, for instance. As technological progress provides for proven automation they will take that into consideration in the context of manning, training, and licensing requirements.

No doubt the skill content of seafarers will have to increase, as technology progresses. In the United Kingdom, for example, there are several nautical colleges with very advanced training schemes based on technology. In the LDCs, there are several regional and national (country-specific) training schools, but I am not sure how advanced those schools are in the technological area. It is also true that IMO now is focusing on training requirements that might be met by the World Maritime University which is being built in Malmo, Sweden. When that program is scheduled to come into operation I don't know, and I'm not quite sure what the curriculum will be, but presumably the technological aspect will be taken into account.

The exclusion of government cargos in state trading is a very pregnant question, because, in my view too, they are excluded from the Code. If the Code were accepted according to the ESC reservations, that would be one way of more or less dealing with state trading. Basically what the ESC reservations say is that the Code would apply in trade with LDCs, but not with OSED countries. State trading countries to which we could not expect to give reciprocity would be excluded from any benefits that the Code could possibly give. Therefore, if the U.S. or any OSED country embraced the Code under ESC reservations, they would have the ESC code with the LDCs, but state traders would be excluded from it. That way, obviously, we would have parity with these state traders.

Now, what constitutes national shipping? What LDCs have done, and anyone else can do -- and that would be relevant to the United States as well as to Canada -- is to designate any kind of flag carrier as the national carrier. That would be one way to get national shipping.

As to whether the Code will increase or decrease costs, it's a toss-up. I tend to believe that costs will increase, but they might equally well decrease. I don't know honestly.

It's the same with the argument for and against Conferences. You're right, of course, that the Code will bring about closed Conferences, and that leads to your question, what will happen with cargo sharing? The Code condones and actually encourages closed Conferences, because it cannot operate without them. Closed Conferences mean the end of competition really. Will that mean higher costs and freight rates, and will it not? Personally, I tend to believe that it will, but there is an argument that if you close the Conferences and get rid of the excess competition, you provide an opportunity to rationalize services, get rid of excess capacity, and thus lower average costs because of high capacity utilization. There's another

argument which says that you may do that but will not get the same kind of technological progress which you get under the stimulus of competition, and, therefore, prices or costs will increase and freight rates will increase. As I said before, I tend to believe that costs will increase for the simple reason that demand will be brought to bear on a limited supply and I don't see how it can decrease. But again, we don't know.

Will there be subterfuges, and how will they get cargo into these closed Conferences? If you are going to divide the cargo between the participants in the trade -- and the Code gives a guideline of 40 percent for each trading partner and 20 percent for a third party carrier -- then obviously you have to have some machinery to steer the cargo to the flags of these participants. The best way, and the easiest way, if you want to avoid this kind of bureaucratic machinery, is simply to say that my trade will be served only by closed Conferences and my shipping lines must be members of a particular Conference. What you do is simply say that all cargo, including liner cargo, must be shipped by Conference flag or Conference ship. Then the Conference in question will have to agree and have a pooling arrangement, whereby 40 percent of the revenues probably will be allocated to the trading partners whether they carry the cargo or not. Basically, you'll get 40 percent of the revenues, whether you carry it or not. In my view, cargo steering will lead to closed Conferences and Conference preferences; and that's where we will stand.

ALASTAIR COUPER: I think Professor Abrahamsson's point was that, due to the activities of the offshore oil industry, many of the salvage tugs around were being used in the offshore area and there was a bit of a deficiency in the availability of tugs for salvage. I think the experience in most areas is that there's very much greater shipping safety where there is oil production activity in an offshore area. There's an enormous amount of salvage-type vessels around, and they're available. The real problem has lain, as we know, in the hesitation by captains to accept salvage. We know this is due to the crippling conditions of the awards that have been made to the salvor.

I understand there's a new convention taking shape on this, but I'd like to hear a little bit more about it in its implications for the coastal state. On the one hand, the salvage operators might simply be paid an economic rate for taking the vessel in tow -- something that relates to the risk and to what they're doing, not associated with the value of the ship and its cargo, as such. This is bound to reduce a bit the incentive for a salvage operator to go to the assistance of a ship in really hazardous conditions. On the other hand, the master could be compelled to accept a tug by a coastal authority (a coast guard or someone else) when they consider that his ship is in sufficient danger. This takes the decision out of the hands of the captain.

But in either case, it seems to me that it is the coastal state which must take responsibility for salvage. Does this mean that coastal states will have to build up a salvage fleet, and always have tugs available in various parts of their sea area? The salvage companies have deployed their fleets in this way, knowing where the risky areas are. In some cases they converge on it, when they hear ships are in trouble. What I'm asking is, what are the implications of the new convention for the coastal states in their territorial seas or economic zones or high seas?

FRANK WISWALL: Well, with regard to the proposed salvage convention, I'm going out on a limb here, because the Legal Committee has not yet begun its substantive work. I can at least tell you what some of the most extreme proposals are for the situation that Professor Couper raises.

I think we begin with the fact that the Intervention Convention at present permits state control of salvage services on the high seas, where there is a threat to the coastline or related interests of the coastal state -- at the moment by oil only -- but if the 1973 Protocol to the Intervention Convention comes into force, then the same will apply to threats from other substances as well. I think we therefore can set aside state operated salvage services for the moment, because the United States Coast Guard, the Canadian Coast Guard, or other similar organizations with those resources acting under the aegis of the Intervention Convention would, it seems clear to me, have a complete right to assume control of a salvage operation and carry it out regardless of the wishes of the master, and without any contract being involved where there was a grave and imminent threat to the coastline or related interests.

The proposed salvage convention, it has been suggested by some states, should enable coastal states similarly threatened but with no direct salvage resources of their own to commandeer, in effect, private salvors for the purposes of carrying out mandatory salvage. This would be done legally either by requiring them to be licensed by the coastal state, if they are to operate within the waters of the coastal state, and the license would be granted on condition that the salvors subject themselves to this regime, or conceivably, in the extreme case where it was a high seas or economic zone operation, simply by force of the coastal state's rights under the Intervention Convention to commandeer any necessary resources. The least that the salvage convention would have to do in such cases would be to insure that salvors were adequately compensated for their services, and for any risk that they undertake at the direction of the coastal state.

The next question is, who is to be responsible for negligence in the course of the salvage operation, which might result in very disastrous damage? There opinions vary. But in my view if the coastal state mandates the salvage, it assumes control of the operation and is thereby responsible for any consequences of negligence.

LUNCHEON SPEECH

IN SEARCH OF A GOLDEN MEAN

Rupert J. Tingley
President
CN Marine

Let's first go back to a simpler time; a time when the world's oceans were regarded as belonging to no one and freedom of the seas was the operative principle. Our oceans were of concern to maritime nations, but not in terms of rational management or the fair sharing of its resources. Rather, maritime nations viewed the seas as a tool to serve them in their quest to exert power over each other or as a necessary evil to be overcome in the race to discover and claim new worlds.

As Sir Walter Raleigh put it, "Whoever commands the sea, commands the trade; whoever commands the trade of the world, commands the riches of the world, and consequently the world itself."

As for the fish in the sea, not to worry; they were an endless inexhaustible resource.

Man's view of the sea was straightforward. One used it to serve one's own purposes and it required little attention. It evolved that the only exception to the principle of freedom of the seas was the accepted rule that a coastal state had sovereign rights up to a distance of three miles from its shores. A sensible rule for its day, in that it represented the maximum range of a cannon ball.

How things have changed. Consider for a moment how much simpler ocean management and marine law would have remained had the Dutch jurist Grotius been correct in the concept of the seas he expressed in 1609:

Most things become exhausted with promiscuous use. That is not the case with the sea. It can be exhausted neither by fishing nor by navigation. That is to say, in the two ways in which it can be used.

The seas have certainly proven subject to exhaustion and to serve many more purposes than fishing and navigation. The failure of many fisheries and the emergence of conflicting, often mutually exclusive, expectations from a whole new generation of ocean users have changed the way in which we look upon the seas.

Many of these new expectations have brought participants to this conference. But, whether our primary concerns with the fishery, offshore development, ecological imperatives, or shipping, we all share the same dependence upon the ocean to fulfill our ambitions or carry out our business.

We might differ in how we wish to maximize the potential in, on or under the ocean; but we must share a common resolve to minimize the conflict between us, while preserving the ocean's ecological integrity.

I don't need to dwell on conflicts, either real or potential. They run the gamut from the fishing boat and the oil rig competing for the same piece of ocean, to balancing off the potential for development against the danger of pollution.

The problem is: how to reconcile these conflicts and establish harmonious relationships between our divergent interests? The first Law of the Sea Conference in 1958 was a significant development in that it recognized that the only hope for reconciliation of conflicting development is through the rule of law.

There's no question that bringing a rule of law to ocean management and commerce that is equitable, or at least acceptable, to all interest groups is a formidable task. But we must recognize that there exists no other acceptable alternative to bringing order and fairness into the increasingly complex marine world. Gunboat diplomacy might provide short-term nationalistic satisfaction, but little long-term security.

My respect for the lawmakers among you is considerable. However, my view is tempered by an appreciation of the effect your deliberations have on the real world of sea-going operations. As the Nobel Prize winning author and philosopher Albert Camus wrote: "The law's final justification is in the good it does or fails to do to the society of a given place and time." And in this respect there are two things I would ask you to keep in mind as you go about your work. The first is that your task is ultimately to help men get along with one another, not multiply the number of regulations which already burden their lives. Over-regulation would only create more abrasion among marine operators and interest groups. Secondly, a regulation is not sensible unless it retains logic, purpose and reasonableness under practical application.

This last point is important. When a decision involves the formation of regulations bearing on relationships as complex as international law, national transportation and economic policies, and traditional ways of doing business, you can be sure that in at least one of those cases it will be in error. Something will have been overlooked.

I am speaking to you today as a representative of an industry which does not want to be "overlooked" when laws and regulations affecting it are being fashioned. It is a multi-billion dollar industry, active in every corner of the globe. It can be found in remote and rarely visited ports. It can also be found in the most congested harbors and ocean arteries of the world, active in foul weather and fair, in sight of ice floes and palm trees, at noon and midnight, and often required by the nature of its business to operate directly across normal shipping lanes.

It is an industry which employs, except bulk carriers, almost every type of vessel imaginable: from freighters to cruise vessels with casinos and swimming pools. Spartan barges with nothing but their cargo. Ships steered with a cable. Ships that fly -- almost. And ships equipped with state-of-the-art navigational aids. It is an industry which annually moves.

Millions of tons of almost all forms of ocean freight, and which transports more people each year than all the world's airlines. The industry of which I speak is one of which most people seldom think, except when they need it: the ferry business.

CN Marine, the company for which I work, carries two million people, one million vehicles, thirty thousand railway cars, and seven hundred and fifty thousand tons of freight a year. We provide service on eight basic routes at ports ranging from Portland in the state of Maine to Nain in Northern Labrador. We operate a variety of ships ranging from passenger-only vessels to freight only, to rail car, to ro-ro truckers, to ships that can carry all those forms of traffic.

But none of that makes us unique or especially large. Washington State Ferries carries eight times as many people as we do. The Alaska Marine Highway serves as large an area. Hong Kong Ferries operates a greater variety of vessels. We are not unique; rather we are in many ways "representative of a norm -- If there is such a thing as a normal ferry service, -- and many of our problems can be fairly described as representative of those for ferry systems everywhere.

Consider, for example, the basic problem of frequency. When people draft regulations concerning pilotage or port fees, they usually think in terms of what might prove acceptable to an operator who visits a port once, twice or several times a month; not once, twice or several times a day. But the fact is, as soon as you talk about ferry transport, you often find yourself dealing with an altogether different -- and larger -- scale of marine activity.

Ferry services usually function as an extension of a land transportation system, be it a railway, a trucking company or the family station wagon. Railway traffic and transport trucks operate under their own tight schedules, as does the family trying to squeeze every moment of enjoyment out of an always too short vacation. None can be expected to be very tolerant of any ferry service whose inefficiency throws a wrench into their schedules, deadlines or expectations.

Some ferry schedules are very tight indeed. A few years ago we planned a change in our ticketing system. It would have increased average transaction time twenty seconds in one service. Adding twenty seconds to each transaction would have meant unacceptable delays during peak periods, or construction of an additional toll booth and traffic lane. So we had to back off the original idea.

And what is my point here? Well, the transportation of dangerous goods through populated areas in trucks and railway cars worries all of us. For better or worse, however, those same trucks and railway cars are carried on our ferries. As unpopular as the evacuation option is on land, I can assure you it is much less desirable aboard a ship.

My point is this: under such circumstances how does one protect the public's interest without vastly complicating and perhaps eliminating the kind of service a high volume ferry service was meant to produce? And in a situation such as this,

which regulations should govern? Highway regulations? Marine regulations? Railway regulations? Or all three at different times?

We are trying with our customers to fashion a solution to this problem. And I think with good will and hard work one will eventually be found. But I don't think even Solomon in all his wisdom would deliver an adequate solution working through the regulatory process alone. In the ferry industry, those of us affected have to be part of the solution. Consider the same problem in a different guise. In our Prince Edward Island service, we do not know the names and addresses of the passengers we carry. If through some tragedy a ship were lost, and travellers with her, we could not say who they might have been. Yet I do not know how with our present terminals and fleet those names could be obtained and an efficient, high volume service maintained adequate to meet existing demands.

And if you think that such a regulation might prove difficult for us, consider what it would mean for the Staten Island ferries. They carry 20 million people a year.

What I am really trying to say here is that ferry systems are a significant form of shipping -- but they do not fit the norms people usually associate with marine activities. Frequent sailings of short or relatively short duration is one of their common characteristics. High volume traffic moved on schedules in which minutes count is another. Essentiality of service is often another. And thereby hangs a tale.

Like many ferry companies, we operate services so essential to local economies and commerce that we lack a freedom common to many other businesses -- the freedom to go out of business. Perpetual maintenance of two of the services we provide is in fact stipulated under the terms by which the provinces concerned entered the Canadian confederation.

Like many ferry operators we deal internationally in ships, chartering and buying as required to meet our needs. One of our ships was secured through a window-charter agreement signed in 1976 with a Swedish firm. Earlier this year, we exercised an option under the agreement to purchase the vessel only to find the owners had agreed to sell it to another firm. Court action in London won a decision that said yes -- we had a prior claim to the vessel. But since it was already in the hands of another company, they were awarded possession, and we were awarded damages. That kind of solution may satisfy the operator of a conventional shipping service. For nothing truly essential may be at stake. The operator can buy another ship or put his money in the bank and let a competitor take up the slack. But money is not a solution for a ferry operator with an essential service on his hands. Producing the right ship for those who need it when they need it is the only thing which will suffice.

Not all ferry services can be deemed as essential as those maintained for Newfoundland and Prince Edward Island. But all ferry services have to provide highly regular and dependable service in order to successfully discharge these responsibilities and maintain patronage. Problems of law and

regulation of much less complexity than the one represented by our window-charter can still create considerable difficulty for a ferry service.

Consider, for example, our ship, the Marine Evangelina. She was originally built for Norwegian interests and served European owners for years, meeting European legal requirements of design and safety. She went to work for CN Marine between Yarmouth and Bar Harbor under a Bahamian flag. Still no problem. Then last year we put a Canadian flag on her to make her eligible for fuel subsidies. Eight hundred thousand dollars later we think we've finally satisfied the Canadian Coast Guard that she meets all legal requirements for safety for the route on which she had already been operating. For some months, however, we have not been able to provide the service capacity we were supposed to provide. And we lost the fuel subsidy in the bargain.

If the window-charter was an excruciating illustration of what happens when a ferry service collides with a normal legal process, and if the debate over how much water the Evangelina could draw when loaded was an agonizing brush with the regulatory process, let me complete my litany by citing a baffling confrontation between bureaucrats. Some years ago we chartered two vessels from Sweden for service in Newfoundland. Canadian authorities refused to accept the Swedish-designed life jackets that came with them. The Swedes refused to have the Canadian jackets aboard. One of our technical people assured me (a) that if I had to use either jacket, I would be equally well served, and (b) that the dispute on both sides had more to do with protection of national manufacturing interests than the safety of the passenger.

Under the circumstances, I did what any prudent ferry operator caught in such a crossfire would do. I closed my eyes and prayed for a busy summer.

Ferry services have their own special needs -- their own special problems -- and sometimes, their own special opportunities to shape marine convention and experience. This is a point I wanted to make before closing my speech. Originally I had thought I would seek an example from the world of marine hardware to make my point but something else came to mind a week ago which might be of interest to you.

Because ferry services tend to carry all kinds of people -- what the statisticians call representative samples of the population -- considerable importance has been recently placed on ensuring that ferry services are equipped to meet the needs of disabled travellers. We invited a volunteer task force of disabled people to critique our services. They raised some interesting questions about marine safety procedures. For example, how do you ensure that the visually impaired can easily reach a lifeboat station? That a person in a wheelchair can get into a lifeboat? That the deaf can "hear" your fire alarm?

As I say, we ferry operators have our problems. And I suspect that for each of our problems there exist several solutions, most of which don't work. Finding the one that does

takes time, and patience, and recognition of the fact that you cannot state or propose a rule that enables you to deal with every problem.

We have people in our company who, perhaps like some people in regulatory agencies, are prone to ask whenever they face a new problem: "What is our policy on this?" And to say: "If we don't have a policy, we'd better get one." From the policy store, no doubt. I would not want to work in a company that had become policy bound. Neither would I want to work in one devoid of guiding principles or statements of purpose. In this respect, the matter is probably not all that different from the problem which confronts you. How can you establish the basic principles for the rule of law on the sea without also becoming rule-bound? I don't know -- but as an operator who has ultimately to live with the result, I hope it is some kind of a golden mean -- and golden rule -- which always guides your deliberations.

PART V

SHIPPING:
THE CHOICE OF TECHNOLOGY

INTRODUCTORY REMARKS

Panel Chairman Edgar Gold
Dalhousie Ocean Studies Program
Dalhousie University

This afternoon's panel is a continuation of this morning's discussion, but with a slightly different emphasis -- we have three principal speakers. The first, Ernst Frankel, is an extremely well known marine technology teacher, innovator, consultant, analyst, professor of ocean engineering from Massachusetts Institute of Technology, mariner academic: In short, a person who has made an enormous contribution to this field.

At the end of the table is Julian Parker from London, England, secretary of the Nautical Institute, which, for those of you who are not acquainted with it, is a rather unique international professional association of mariners dedicated to the professionalism of those who go down to the sea in ships. Julian Parker is a Fellow of the Institute. He holds a degree in nautical education, nautical science, and of course is also a master mariner.

In the middle sits Harvey Silverstein. Dr. Silverstein is another person of many paths. He came to Halifax originally from the Carolinas, where he had been a political science professor. He came to the center for Foreign Policy Studies here at Dalhousie as a visiting professor and is now the president of a consulting firm called Marine Technology Consultants. He is also the course director of this summer's International Ocean Institute ocean management training course at Dalhousie University. Many of the students at this course have been amongst us these last two days.

The theme of this year's Law of the Sea Institute conference is "The Law of the Sea and Ocean Industry: New Opportunities and Restraints." Quite naturally, such a theme had to include shipping, which, as we all know, is the most ancient ocean industry. The Third U.N. Conference on the Law of the Sea relegated shipping almost to the sidelines by concentrating much more on the navigational rights of ships than on the commercial purpose and safety of the industry. These were to be left to the "appropriate international organization," presumably the UNCTAD Shipping Division we spoke about this morning and the International Maritime Organization, whose representative Dr. Valenzuela also spoke to us. However, the development of marine technology has so far escaped the "clutches" of the regulators. And that is both good and bad.

It is good because the concerned international regulatory bodies are fragmented and diverse to the extent that, until a proper, fully fledged maritime transit organization is established, it is better to leave things as they are. It is bad because the IMO and the UNCTAD Shipping Division must look at "safe ships and clean seas" and a variety of commercial

questions without being permitted or even qualified to look at the required technology. As a result, shipping technology is still very much up to the industry itself. Even the ship construction sector is told what to build rather than using its not inconsiderable expertise to develop the best, most cost effective, and innovative, ships.

Since time immemorial, ships have followed market trends and often very vague trends at that. Like the rush of the lemmings, shipowners hurry onto the band wagon from super tanker to VLCC to ULCC to lay up -- all in a few short years. As has already been indicated, the same has occurred in the oil and bulk trades, in the carnage of liquid natural gas and, lately, in the container business. In almost predictable cycles, the shipyards of the world race to build ships, many of which are often redundant before they are completed. Mr. Wiswall gave us some very telling examples of that this morning.

Although a lot of money is made during the high period, much more is lost during the not infrequent slumps. We are in the midst of one of the worst ones right now. The cost is enormous as we are talking about fairly expensive technology. This almost knee-jerking reaction by the industry to the vaguest market trends needs to change, and perhaps we are standing on the threshold of such change. But if this is so, it will be more of a change, rather a revolution. It is quite possible that technology itself will force this change and will no longer allow itself to be fettered by short-sighted market considerations. It might well break the chain and take off as aviation did in the 1950s and 1960s. Professor Frankel will, of course, address you in much greater detail on some of these aspects.

Secondly, shipping will, in any case, be operating in a very different environment, and the new ocean regimes will dictate a whole new phalanx of monitoring, surveillance, and communication methods. Again for shipping, a quantum leap into advanced electronics. Dr. Silverstein will inform us on this.

However, an aspect often forgotten is the human factor. Are the seamen of today and tomorrow ready for the varieties of marine technology which will face them? Julian Parker has probably more insight on this than anyone I know. He will comment on that.

CHOICE OF TECHNOLOGY:
PROBLEMS IN THE WORLD SHIPPING INDUSTRY

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OPPORTUNITIES AND CHALLENGES

The choice of technology in shipping has become an increasingly complex issue, not only because there are such large numbers of technological alternatives available today, but also because of the increasing demands for more specialization in cargo form, containment, types of handling, methods of transport, and efficient intermodal interface. In addition, there are new requirements imposed by safety and other regulations, including the imposition of an increasing number of dimensional and other standards. All of this has led to a tremendous variety of ship types, ship sizes, methods of cargo transfer and stowage, ship handling methods, ship configurations, methods of energy conversion and ship propulsion, ship maneuvering and control, and many other shipping technologies.

Some of these developments are based on transfer of technology from other modes of transport or other industries. Their potential performance in the maritime transportation environment can therefore be forecast with a fair amount of reliability. While some of these concepts require intensive engineering effort to achieve a feasible technological breakthrough in the shipping field, others may require little development, particularly subsystem development. This applies particularly to technological areas such as propulsion, thrusters, or material handling equipment. Although most of the recent technological developments have been in cargo handling and stowage systems, many changes in transportation vehicle design and configuration have been introduced as well. Container and unitized cargo handling methods which are expected to reach a level of about 70-80 percent of all break bulk or general cargo trade worldwide by 1990 may be replaced by other unitized cargo handling methods before the end of the century. There will obviously be some trades in which unitization will lag, but even small LDC countries are now entering the container trade. Similar projections can be made for bulk and other transport forms in shipping. While fairly good forecasts can, as a result, be made of the potential growth of transportation requirements, technological forecasting of transportation developments in areas where basic breakthroughs are needed is more difficult. Modern technological forecasting techniques, such as the Delphi method [1], have been successfully used to derive statistical estimates of the trend and sensitivity of

technical developments for time periods extending over thirty years. Recent work in total transportation system design has resulted in the establishment of basic development aims and requirements. These in turn have given impetus to research and development projects with a larger degree of direction. On the other hand, we note that a larger discrepancy continues to exist between the progress made in the development of requirements and the physical or operational implementation of recommended solutions.

Whether or not a developed technology will be adapted for commercial applications is more a function of real or perceived need than of development [2].

THE CHANGING ENVIRONMENT

World trade is changing continuously in composition, type and physical form of cargoes, cargo routes, terms of trade, and length of average trading distances. The growth of world trade by major commodity types is shown in Figure 1, while changes in average trading distances are presented in Figure 2.

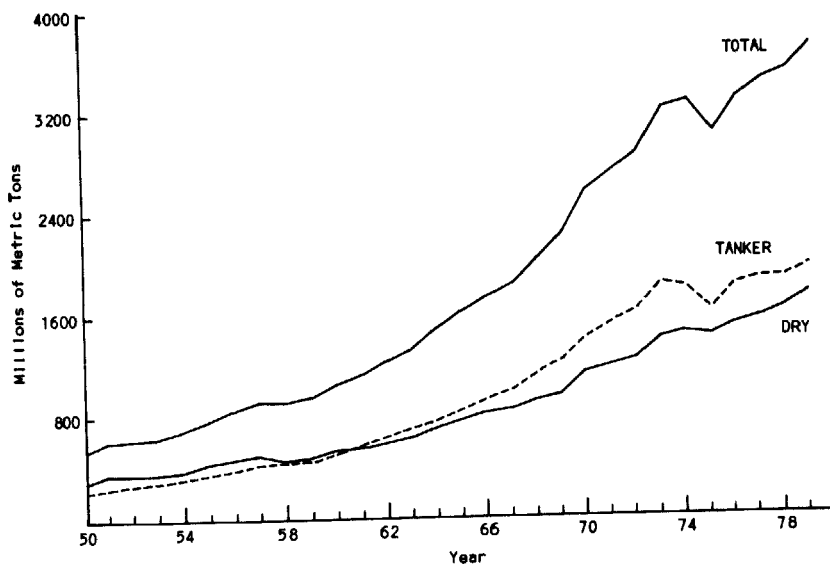
It is noted that, while the rate of growth of world trade has slowed appreciably in recent years, the average trading distance has actually declined, indicating a determined effort to locate processing plants closer to the sources of raw or semi-finished materials. This is also affected by the slow, yet steady, rate of industrialization of "less developed countries" (LDC's), increasing development of raw material, especially fuels, in or near industrial concentrations, and a larger degree of rationalization of international shipping.

International Agreements

Similarly, there are many new concepts under consideration or implementation which would affect the philosophy and method of operation of traditional shipping.

The UNCTAD Code of Conduct of Liner Conferences, with its cargo-sharing provisions, similar proposals advanced for international bulk shipping, bilateral agreements, unilateral cargo reservation and preferences, as well as many new approaches to shipping organization, ownership, and financing, introduce many new and challenging factors influencing the choice, method and rate of adoption, and finally use of technology in shipping.

The Code was initiated by the United Nations Conference on Trade and Development (UNCTAD) and adopted in April 1974, when 72 nations voted in its favor. The impetus behind the Code was the increasing discontent of the Group of 77 nations with the operation of the ocean liner conference system, and in particular with the "monopoly power" exercised by the conference serving their trades, which they assumed also stifled their ability to acquire new shipping technology. They also claimed that the present conference system encouraged use of "obsolete" technology in trades serving the LDC's. The aims of the Code are hoped to assist the development of LDC's own merchant



Source: United Nations, Monthly Bulletin of Statistics, March 1981 (for 1970-1979) and January to December, 1978 (for 1950-1969).

Figure 1. World Oceanborne Trade, 1950-1979 (Millions of Metric Tons)

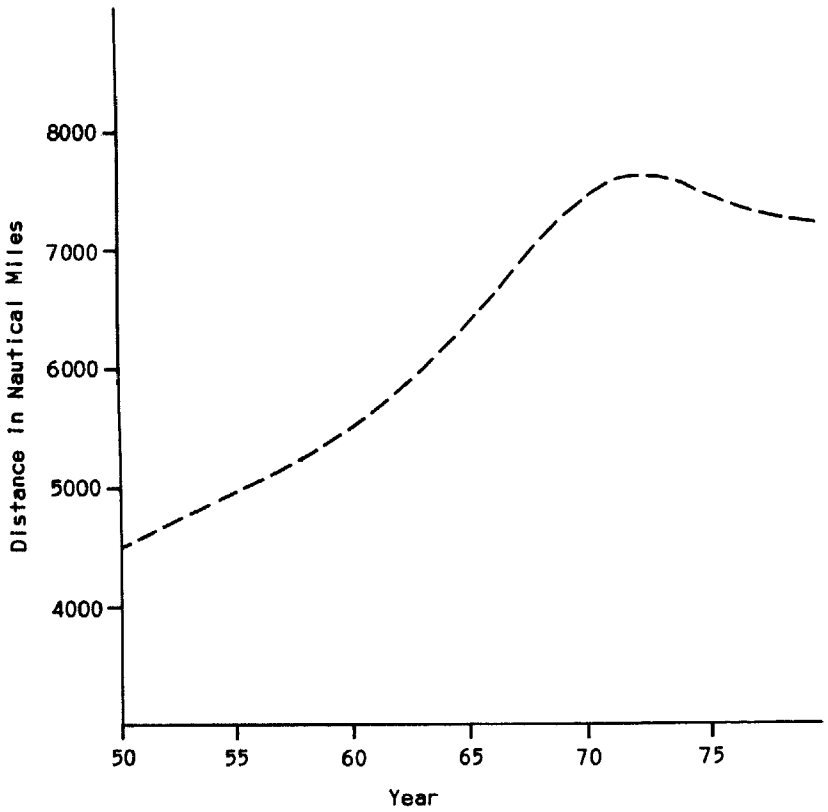


Figure 2. Average Distance (One-Way) World Oceanborne Commerce

marine, an increase in their international trade, and thereby help the growth of their national economies. A multilateral treaty like the Code governing the conduct of ocean shipping conference which would "take into account the needs and problems of the developing countries with respect to the activities of liner conferences serving their foreign trade", which is expected to become international law soon, is expected to correct these perceived inequities.

Bilateral trade agreements which are often suggested in place of the Code's provision introduce other impacts depending on the terms of the agreement (cargo, revenue, space, etc. sharing agreements). In many cases trading partners who do not have the required vessels to meet their capacity obligations would have to undertake an expensive increase in fleet capacity, would have to let the trading partner operate the service as part of its cargo share, or charter-in ships to carry their share on vessels or space under their control.

Bilateral agreements are expected to increase the costs of transport because of the limitation on cross-trading, and the lack of competitive pressures to rationalize shipping and introduce new technology. Restrictions on cross-trading limit the efficiency with which vessels can operate by reducing the cargoes which they can carry to those with origins and destinations within the trading countries, with the exception of marginal trades left open under the bilateral agreements. While most current proposals call for 20% of the trade to be open, the competition for this cross-trade will usually be heavy.

The effect of bilateral agreements on costs of transport is usually most dramatic during the period immediately following implementation of the bilateral agreement. While bulk trades are as yet not included in the Code or in existing bilateral shipping agreements, there is increasing pressure to cover their trades by similar agreements. The effects are expected to be similar. There are some countries, particularly among LDC's, which have already introduced cargo reservation systems in their bulk trades on a unilateral basis.

Ownership and Ship Financing

There are also other changes in the shipping environment which affect the development, choice, and adaptation of technology. One is the changing method of ship ownership, registration, and control of space and capacity. Joint venture, cross-national, and other novel forms of ownership are becoming more prevalent now, as are new or original methods of ship financing. Government and other public financing plays a greater role today than ever before, but the real imaginative financing schemes are found in lease-purchase, leaseback, and similar arrangements. These are often combined with multiple loan arrangements, some if not all of which may be subsidized by government, supplier, or builder.

Ship purchases are often subsidized by the builder or his government. The final cost to the buyer in real or current terms depends on many factors, and costs of construction may

have little bearing on the final costs to the buyer. Available financing and final costs to the buyer have a larger impact on the selection of the builder, and thereby often on the choice of technology or the type or size of ship, than most other factors. Engine manufacturers and other suppliers are often involved in or offer their own financing packages. Therefore, not only the selection of the builder but also the choice of major ship system is affected by financing decisions.

Ship Manning and Crew Training

Another factor in the choice of technology is obviously the availability of trained manning or the availability of training for ship crews. This is closely affected by the choice of ship registry and rules for manning imposed by the country of registry. While some efforts have been made by IMCO (now IMO) to establish some semblance of uniformity or at least minimum standards of training and manning, including tests of crew proficiency, there are still vast differences in requirements, and even more gaping differences in the actual quality of ship crews. This obviously affects an owner's choice of technology.

External Technological Developments

There is also the environmental effect of technology itself. Technological developments continue in interfacing as well as unrelated activities. These impose direct or indirect pressures on the development or adoption of new technology in shipping. With transportation now increasingly designed as point-to-point systems in which shipping serves as only one link in a chain of transport links, new or different technology is often forced onto shipping for reasons of system consistency and efficiency, and not necessarily shipping efficiency. But there are also many outside pressures to adopt new technology. Computers, automation, and robotics are typical examples discussed later in this paper.

Energy Cost and Availability

Finally, there are obviously important effects of energy costs and availability. Marine fuel costs have risen even more dramatically than fuel costs in other economic sectors: \$15 to \$180 per barrel between 1973 and 1981 -- a 12-fold increase, which compares to a 4-to-6-fold increase for most other energy users. But equally important is the increasing degradation in the quality of marine fuels. As marine fuels (Bunker C) constitute the left-overs of the refinery process, and increasing fuel costs have encouraged refiners to improve their processes so as to extract a larger percentage of high and intermediate products, the quality of residual fuels such as marine bunkers has declined and today poses a serious operating problem to shipping.

In summary then the following environmental factors influence the choice, development, and adaptation of technology:

1. changing loading demands in quantity, form, and routes of goods traded;

2. International agreements such as cargo reservations or other restrictive rules;
3. ship financing;
4. availability of manning and the training for manning;
5. manning and other operating rules by International organizations or the country of registry;
6. technology of interfacing transport links;
7. energy cost and availability;
8. pressures or opportunities introduced by technological developments in other fields of human activity; and
9. competitive ship operating environment.

These factors are interdependent, as shown in Figure 3. This increasing interdependence of technological developments on environmental factors and among the environmental factors introduces a dynamic force which simultaneously drives and delays technology choice, adaptation, or development. The economic recession of recent years has caused many delays in the acceptance of new technology, but the technology is there and a major burst of new technology into shipping must be expected as soon as a bottoming out of the current economic recession is generally perceived.

CHOICE OF TECHNOLOGY

The choice of shipping technology is historically based on the evaluation of the impact of the technological choice on shipping costs and service. Today the choice is affected by many other considerations such as:

1. interface technology requirements and developments;
2. market trends with particular reference to changes in physical form, size of shipment, routing and handling of cargo, as well as method of shipping; and
3. competitive factors -- changes in organization of competitors, competitor capacity, technological advantages, degree of intermodalism, financial backing and support, subsidy, government regulations, as well as the other environmental factors discussed before. The choice of technology is increasingly constrained by this large number of interdependent factors, while at the same time these factors as well as technological progress in general provide unique opportunities.

Technological Voids and Development

Industries are usually divided into mature and innovative with other subdivisions defined in between. Mature industries are generally assumed to have reached their peak and to coast along on their past developments with an inevitable downturn in the future. Innovative industries, on the other hand, are up and coming. It is usually assumed that the latter depend on the recognition of vast voids in technology and technological opportunities which, if filled, would satisfy a real and

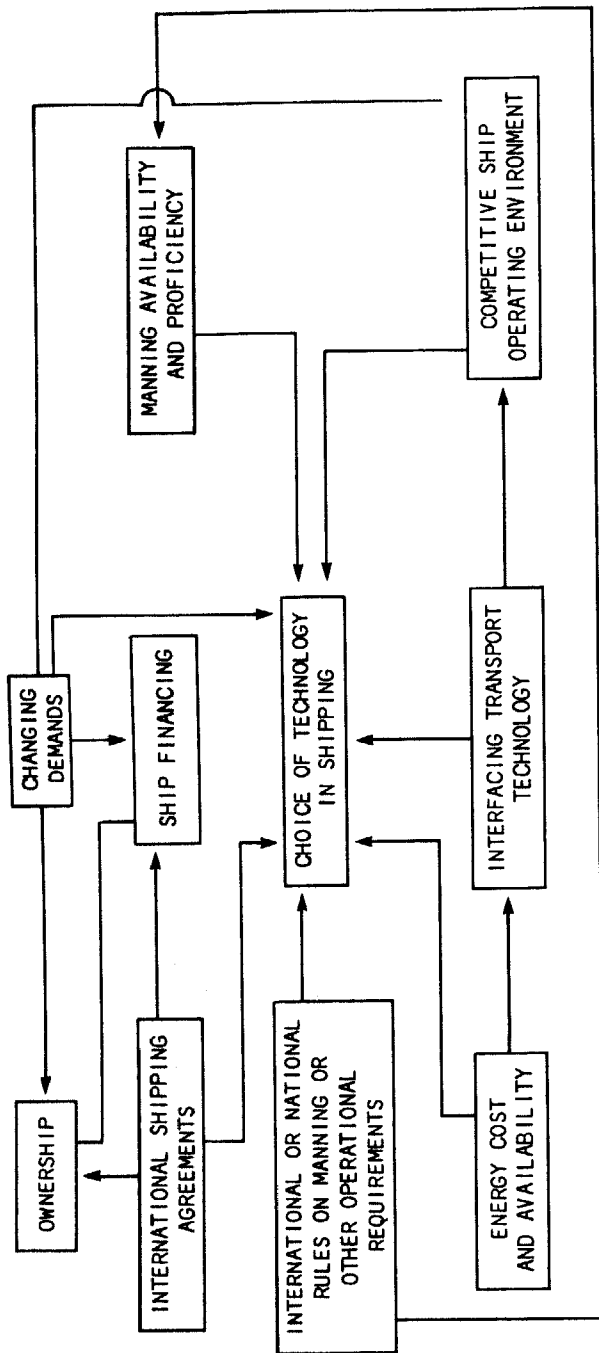


Figure 3: Environmental Factors Influencing Choice of Technology

valuable need. Mature industries, on the other hand, are usually assumed to have filled most technological voids in their field and to have, as a result, few if any technological opportunities. Shipping is generally perceived as a fairly mature industry with few if any technological voids or opportunities. Yet in reality there are many technological voids and opportunities in the shipping industry.

Technological voids are usually identified through:

1. theoretical study and limit analysis;
2. recognition of an inability to meet an existing or perceived service demand;
3. discovery of new opportunities which require technological development or advance;
4. competing developments or developments of competition;
5. discovery of technological developments in other fields with potential application; and
6. technological forecasting.

Technology Transfer and Adaptation

The major steps in the introduction of new technology in shipping are:

- a. evaluation of technology adaptation and implementation capability;
- b. setting of constraints on the acceptability of technology; and
- c. training programs and skill development.

There are always institutional constraints and incentives impinging on technology transfer. These may consist of political, cultural, regulatory, economic, demographical and other constraints and incentives. The evaluation of the effectiveness of technology transfer is usually based on a value system for assessment which is developed through the setting of technology transfer effectiveness standards. This in turn permits the measuring of technology transfer effectiveness.

Shipping technology assessment is the process of evaluating the planned and unplanned consequences of technological choices and change in shipping. The basic function of a shipping technology assessment is to generate information that will help in the decisionmaking and the planning for contingencies associated with the implementation of such new shipping technologies, especially technologies which may affect interfaces such as ports or other modes of transportation.

The primary objectives of a technology assessment are to identify and analyze the relevant economic, technological, legal, institutional, and environmental consequences of projected technological changes, to analyze the ability to accommodate the technological change, compare the alternative technological choices available, and identify and analyze the uncertainties and risks associated with alternative technological choices.

Technology assessment is designed to improve the specification of alternative shipping technologies and their profitable outcomes. The results of a technology assessment, and issues that affect and are affected by shipping technology choices must be identified to be useful. Although this identification is difficult, it is important and must take into account the perceptions and interests of all users.

Problems in the transfer of technology usually involve:

1. maintaining technology transfer flow;
2. timing of introduction and updating of technology;
3. effectiveness of the technology transfer;
4. decisions regarding stepwise versus continuous technology transfer; and
5. feedback and feedforward of technology use information, particularly relating to changing in technology or its use in the new environment.

The adaptation of new technology in shipping is particularly difficult because of the constant mobility of ships and the large turnover of ship staff.

Choosing Technology in Shipping

The choice of technology in shipping is particularly difficult, because, as mentioned before, in shipping all the usual forces which drive technological development in less mature industries are extremely volatile and non-stationary in space or time. Similarly, the risks of error in technology choice and adaptation are high and because of the nature of the shipping business, can make or break an innovator. There is an old saying that in shipping you are either rich or poor. Very few ship owners or operators are just comfortable. Timing of technological investment and change is crucial, and intelligent and well-informed decisionmaking is based on detailed knowledge of all the environmental factors discussed before.

Technological decisions once made must be implemented without delay. To choose technology for shipping effectively we must have access to large amounts of information, long experience, good judgement, and an ability to make rapid decisions and commitments. This framework and requirement is quite distinct from the basis and methods used in technological decisionmaking in other industries.

DEVELOPMENTS IN SHIPPING TECHNOLOGY

The major objective in the development of new shipping technology is to assure improved shipping efficiency, profitability, and capability for more effective integration of operations with those of terminals and other modes of transportation time and costs. An increasing percentage of world shipping operates as an integral part of total transportation systems serving specific inland-to-inland commodity transport. As a result, we generally do not attempt

to optimize shipping costs, but to optimize total transport costs. To achieve this, greater emphasis is now given to ship size, speed, form specialization, concentration, physical form of cargo carried, and cargo transfer technology as related to total transport systems requirements, and not as these parameters relate to shipping costs and time. Many new ship types and hull forms are now in use or planned, most of which have never been considered before. Most important, there is now a rising level of specialization in the development of ship types to meet the need of particular commodity trades, special transport as well as transfer requirements.

In addition to conventional ship types such as general cargo ships, tankers, dry bulkers, containerships, and trailerships, there are today many new types of largely specialized carriers. It is noted that few ship types actually operate at or near their design speeds. In fact, design speeds are expected to be lowered further as fuel costs rise.

In addition, there are many ship types that serve offshore-related activities. Ships and barges are increasingly used as floating terminals for cargo storage and/or cargo processing.

Recently, specialized feeder vessels for container, trailer, barge, or parcel tanker feeder runs connecting outports and principal ports, have been introduced successfully in many parts of the world. Ocean barging is of growing importance. Numerous types of tug/barge or barge/barge coupling systems have been developed. Ocean barging, particularly in coastal and nearby ocean trade, has become the most rapidly growing element in ocean transportation.

General Ship Technology

Although hull forms and propulsion systems have not changed significantly, there are developments which will affect future choice of shipping technology.

Hull Technology

The most important developments in hull design form are in the area of low-resistance, single-hull displacement vessels in the area of multi-hull displacement and semi-submerged displacement vessels. High fuel costs have encouraged the use of lower speeds and produced a resurgence of cylindrical bow, short, stubby, wall-sided hulls with well prepared and maintained surfaces, with frictional resistance dominating at the practical ship speeds of today, and with hull surface maintenance, using afloat hull bottom cleaning, which can reduce hull resistance by 5-8 percent.

Appendages such as bulbous bows, bilgekeels, and skegs, are more controversial. Their use depends largely on the expected operating profile of a particular vessel. The most important form developments, though, are in the stern lines of vessels, where recent hydrodynamic research indicates the advantage of radical changes in the flow lines into the propeller. Multiple-hull ships such as catamarans and semi-submerged catamarans offer major advantages in terms of usable volume or deck area

and have significantly lower resistance at higher speeds. Such vessels are particularly attractive in passenger service as RoRo vessels or serving as containerhips. Although the concept was developed in 1962, it has only been in use in the form of small, sea-going research or survey vessels or passenger ferries. It offers an additional advantage in terms of reduced ship motions in rough seas. Semi-submerged catamaran vessels of equal displacement have a usable volume of about twice that of a conventional vessel, 2.4 times the deck area and a resistance which is about 20-35% higher at low speeds of up to 18 knots, an equal resistance at 20-22 knots, and significantly lower resistance at higher speeds. Motions are usually a fraction of those of a conventional displacement vessel.

Propulsion Technology

In propulsion technology the trend is obviously towards low, specific fuel consumption plants such as long stroke, slow or medium speed diesel engines. Although modern steam turbine plants have been vastly improved, their efficiency is not yet a match for diesel engines. They have the advantage, however, of being able to burn coal, coal/bunker slurries, and other cheap fuels. In fact, there is even a resurgent interest in modern reciprocating steam engines which, though less efficient than steam turbines, combine a low-cost fuel burning capability with constant specific fuel consumption over a very wide range of outputs and propeller speeds.

Recent research is devoted to the development of injectors and fuel preparation equipment which will permit coal slurries to be burned in slow diesel engines as well. There are other prime mover developments on the horizon, including efficient low-cost, dual-cycle, or combined plants.

Steering and Propeller Technology

New types of duct or nozzle flow directors have been developed which have been shown to increase propeller efficiency by 6-8 percent. There are similar developments in active as well as passive steering and steering-assist devices which are expected to both reduce steering appendage drag and increase steering response, ship turning circle, and steering effectiveness, particularly at low speeds.

Bulk Carriers

The average size of bulk carriers has come down appreciably in recent years and fewer, if any, very large bulk carriers and tankers are expected to be ordered in the near term future. The reasons for this are manifold but consist essentially of shorter average trading distances lower volumes of trade, insufficient port capacity, and the need for service flexibility. Very large bulk carriers are much more tied to particular services and ports' facilities than smaller vessels -- a characteristic which is increasingly important at times of uncertainty in trading patterns.

A major technological choice is obviously use of increasingly popular integrated oceangoing tug-barge systems. Oil and dry bulk barges of up to 85,000 DWT rigidly or flexible couple to a tug which can be disengaged rapidly in any sea state and operating conditions are now in service and offer major advantages particularly when employed in a drop and swap mode, when the utilization of the tug is great and the barges serve both as transport vehicles as well as stockpile facilities. A large number of new and effective tug-barge coupling systems have been developed.

Dry Bulk Carrier Technology

The major technological advances and choices in bulk carrier technology are in the area of ship unloading, ship form, and ship use. Bulk carriers, though smaller on the average, are today more sophisticated. Self-unloading, internal or shipboard cargo leveling, automatic hatch covers, and other devices are increasingly installed on such vessels. Self-unloaders may, in the future, include both trough and bottom conveyor or scraper type cargo collectors as well as topside rail-mounted collection gantry type of self-unloaders. Other developments under consideration are bottom unloading bulkers operating much like a split barge.

A much larger number of bulk cargo types is now considered for bulk shipping such as cement, sugar, salt, plastic pellets, dry milk, etc. In addition to coal, ore, phosphate, grain, and other more traditional dry bulk cargoes. This has resulted in development of numerous new systems for special cargo handling and stowage. Many dry cargoes are today handled effectively in slurry form, either premixed and loaded as slurries or slurried on board.

An increasing number of dry bulk carriers is in dual-purpose service with deck-mounted guides for the carriage of a 4-5 high stack of containers. Other bulk carriers may serve as bulk/auto carriers, bulk/livestock carriers, etc. The availability of backhaul cargo has a major impact on a bulk carrier's economy. In the future the technology of dual- or triple-purpose vessels will expand to include many more alternative services such as heavy-lift cargo, oversized cargo, float-on cargo, such as barges, and more.

Tanker Technology

Tankers on the average are smaller today but more automated. Computerized cargo loading and unloading control is today fairly standard in newly-built vessels. The main changes though are in the subdivisioning of tankers consistent with IMCO and various national requirements. Although double bottoms or double hulls are not yet required, except in some isolated cases, segregated ballast tanks and tank size limits have become a fairly universal requirement. Tankers like other bulk carriers are now generally operated at a low speed of 13-15 knots, and have full wall-sided cylindrical bow hull forms with efficient low-speed propellers. As in the case of dry bulk

carriers, tankers will in the future also be used for dual- or triple-purpose service.

Container, RoRo, and Barge Carrier Shipping Technology

Containers have continued to grow from the 280 TEU vessels of 1960 to vessels with capacities of 3600 TEU and ships with capacities of 4000 TEU are under consideration now. On the other hand containership speed which increased from 17 knots in 1960 to up to 30 knots in 1973 has now levelled off at about 19-20 knots, as a result of the tenfold increase in bunker cost. There are many other changes, among them methods of stowing containers as well as novel methods for the handling of containers. While cellular containerships still predominate, warehouse type or RoRo type vessels are also used as containerships. With containers stacked 4-6 high on deck now, many dry bulk carriers are now used as dual-purpose ships with dry bulk carried under deck and containers above deck. This is possible now because the new full-bodied 19-knot containerships are only about 20 percent faster than a dry bulk ship, which can handle its container cargo a lot faster because it is all deck stowed.

All this current container shipping technology, though, may be obsolete well before the turn of this century. There is an increasing search for a high-cube type of container, a container with a volume of 4-12 times our current standard 8'x8'x40' containers. This would not only permit the faster handling of containerized cargo but would also permit all kinds of outsized cargo to be handled.

RoRo and trailerships today carry containers and other non-wheeled unitized cargo in addition to trailers and other wheeled cargo. The technology of RoRo and combined RoRo/containerships has advanced much more recently than that of cellular containerships.

Recent Technological Developments in Container Handling

1. Belt or Wheel-supported (truck or railcar trains) Container Conveyors (designed to feed a continuous flow of containers to various container handling devices to assure more effective transfer and longitudinal movement of container stacking or handling equipment). These conveyors are usually equipped with automated truck or trailer transfer devices.
2. Computerized Stacking Controls which provide for optimum stacking and unstacking sequences and stack cell allocations. These are designed to minimize transtainer and gantry working time as well as ship turn around time. This type of system is usually coordinated with computerized containership cargo and stowage planning, to minimize container rehandling requirements while maintaining all ship condition requirements.
3. Automated Container Inventory and Storage. Various continuous chain type, retracting and shelf conveyor types of automated container warehousing systems have been

developed. These are designed to automatically stack and recall any container and transport it to or from a transfer station interfacing with pier side gantries and belt conveyors.

4. Batch Container Handling. Several methods for the handling of blocks of standard coupled containers are in use with others under investigation. These designs are attempts to permit handling transfer and storage of blocks of coupled containers. Most are based on transversely assembled blocks of 20-foot and 40-foot containers, sometimes in blocks 2 to 3 high with a capacity of 2 to 9 containers. This is designed to handle also double width or high containers in cell-less or open hold container ships.
5. Container Elevators and Sideload Devices. These are devices similar to shipside pallet loaders or shipside elevators designed to transfer container to or from pier-side to ship decks. These elevators are fed by sideload devices. The elevator either only transfers containers from pier to ship or extends like pallet loaders into the (non-cellular) box type ship's hold, where conveyor, cushion pallet or rail devices transfer or distribute the containers transversely across the ship's width.
6. Container Silos consist of large automated container warehouse type structures.

There are other developments all designed to facilitate container transfer sequence control and ship or feeder turnaround.

In addition, there are many developments such as self-consolidating/deconsolidating containers, collapsible containers, inflatable containers, disposable containers, and more. All of these developments have an impact on port handling and transfer technology and operating requirements and will continue to demand dynamic changes in port facilities, equipment, and procedures, to effectively respond to demands of rapidly changing ship technology.

Barge Handling Technology

Since the introduction of barge-carrying ships, LASH (1967) and SEABEE (1970), this method of transport of floatable containers has become quite popular. The primary advantage offered is the servicing of undeveloped or congested ports by a largely port-independent shipping system. It is particularly attractive for the handling of pseudo-bulk cargoes (bulkable cargoes moving in less than ship lots).

Recent developments include specially designed barge fleeting areas which continue the functions of container marshalling or stacking yards and container freight stations.

They may include barge loading dockage channels or berths where chains or barges are loaded/unloaded while continuously or intermittently moving. There are also hopper-type barge unloaders/loaders, and other devices available now. Finally, consideration is now given to barge dumper, floating, or fixed

devices which lift and invert coal and/or other types of barges for rapid, low-cost unloading into ships' holds.

Communications, Navigation, and Ship Management Technology

Satellite communications will be the standard on all oceangoing vessels before the end of this decade. It is already used by over 50 percent of all ships in excess of 20,000 DWT now. Satellite communications provides not only for information transfer but is increasingly used for weather routing of ships, ship management control, and more. It provides an inexpensive method for the reliable transfer of large amounts of information. Weather routing technology is now being perfected which will automatically derive an effective course for a ship using continuously updated weather information, the ship's characteristics, destination, and voyage objective.

Another development is in automatic collision avoidance systems which use radar tracking, course and navigational environment characteristics, as well as ship characteristics to automatically control not only ship course but also other ship operating functions such as speed, stopping, etc. using on-board computers. Such systems, much like similar systems on planes, are designed to serve as control or advisory systems. There are many other uses of computers existing or under development now. Among them:

1. cargo planning
2. cargo loading/unloading control
3. ship management control (fuel, ballast tank condition, and the sequence)
4. electric and other services, energy use and condition control
5. automatic ship machinery condition monitoring, error detection, and adjustment or correction
6. automatic communication and logging with direct message or information recording, display, aggregation, sorting, and display
7. ship operations planning
8. automatic ship docking or semi-automatic ship docking assist control
9. position and course computations
10. other

In the future computers will be able to be used for all sensing, evaluation, and control functions on board ship. This will not result in "unmanned" ships but will change the role of shipboard manning by eliminating all routine, manipulative, and computation from human functions. It will also greatly reduce human inspection and similar requirements and allow shipboard manning to concentrate on decisionmaking based on full and real-time information, versus the current system where only a very small part of the time is spent on decisionmaking.

Robotics in Shipping

While industrial robotics are proliferating and infiltrating many service and manufacturing industries, they are far from being humanlike androids capable of replacing human functions now. They are, by and large, programmable manipulators and monitors often with large installed memory. Robots must be taught their function and will only respond to demands which are part of their "learning" (programmed) experience. They have no capability to reason or evaluate, judge, or respond to new situations. As a result their applications in ship management are quite limited. But this is not to say that automation based on feedback and preprogrammed control will not continue to make inroads into shipboard operations from automatic engine controls, ship steering, collision avoidance, cargo handling, and food service.

Computers are already serving ship loading and unloading in an advisory or control function on many tankers and an increasing number of container vessels. In case of the latter, computers are generally used to devise optimum stowage, cargo plans, and cargo handling and ship turnaround costs consistent with ship stability, strength, and other requirements.

"Robots" are used to make adjustments to all auxiliary machinery in line with changes in output of main machinery. Food preparation and service "robots" are available and used on board some ships, but by and large these "robot" applications are only an extension of automation.

Now under development are robots which can learn from experiences, perform some higher level planning and use their potential inherently large memory to respond to "new" situations based upon "newly" acquired "knowledge". What such robots obviously need are goals (numerically expressed) which serve as guidelines to their decisionmaking. Such robots of the future with effective monitoring and sensing capability may be able to perform many additional functions on shipboard such as course setting, damage control, ship docking/undocking, and more. This would be a great advance compared to present day robots, which really require each step of a function to be preprogrammed.

The advantage of robot application on board ship would not only be in the potential reduction of crew size and a lesser learning experience for human operators, but should also permit certain ship spaces to be greatly reduced in volume, accessibility, and environmental quality. Human operators could then be more readily switched among different ships, as the "learning" pertaining to a particular vessel would be performed by the vessel's robots while the human would perform only the highest level of decision functions.

No real study of the economic and operational benefits of such developments has been made. There are some estimates that ship operating costs could be reduced by 20-30 percent because of more efficient and closely controlled ship systems performance, better vessel navigation and routing, reduced manning, improved reliability and safety, and larger carrying capacity resulting from the reduction of spaces designed for

human access or habitation. It is too early to predict the role of robots on shipboard in the future. They will certainly have an impact which will affect not only how ships are managed and run but will eventually also affect the whole rationale and method of shipping from an organizational, regulatory, operational, and economic point of view. Much will depend on the progress made by the fascinating robotics industry and developments in interfacing transport modes, many of which use robots to a much larger extent already (pipeline, etc.). Obviously much will also depend on developments in spheres of international regulation and jurisdiction.

Robotics, probably more than any other technological development, will affect shipboard employment both in number and skill as well as in shipboard social structure and lifestyles. Its application must therefore be approached with extreme but educated caution. The transition to shipping automation and growing use of robotics in shipping will occur. It provides challenge, opportunities and risks, but it demands effective measures to be taken now to assure that the experience does not result in unnecessary problems, economic and opportunity loss as well as human distress. It can help to upgrade the quality of shipping services and the skills of the people who man and run shipping. It can also cause irreparable losses.

Ship Management and Technological Developments in Shipping

Ship management is an anachronism in today's industrial world. Many industrial countries such as Germany, Japan, Sweden, and Korea have moved from directed work to collaborative work. Instead of a strict hierarchy in which orders are given by superiors and officers manage on the basis of their rank, and crewmen work as directed by officers -- a method of divided responsibility which leads invariably to conflict, low productivity, and lack of assumed responsibility -- industries in advanced industrial countries increasingly rely on a peer management concept of shared responsibility and management. This has been shown to lead to a higher productivity, work involvement, increased work quality, and as a result more effective operation. This change in approach is particularly important when new advanced technology is introduced, such as the use of computers or robots.

CONCLUSIONS AND RECOMMENDATIONS

Shipping technology has had a very mixed history. It somehow developed in spurts with feverish advances over short periods of time followed by long periods of stagnation. Today marine technology and application advances are definitely running ahead of their market. Market acceptance will definitely develop as soon as clear signs of recovery from the recession are evident. It is important to evaluate the choice of technology in shipping now. Without a realistic review of the impact of near future technology, many of our assumptions about the requirements of shipping may be wrong. Only by facing

the realities of this impending technological revolution in shipping will we be prepared to face the "brave" future world of shipping.

NOTES

1. The Delphi method is a scientific forecasting tool which has proven to be extremely useful in developing projections of technological advances. The method involves interrogation of a controlled group of experts, the analysis of their responses, and a feedback process which minimizes uncertainty in the final forecasts.
2. J. Schmookler, Invention and Economic Growth (Cambridge, Harvard University Press, 1966).

A VIEW FROM THE BRIDGE

C. J. Parker
Secretary
The Nautical Institute

It is a great honor to respond to such an eminent maritime scientist as Professor Frankel. But for the purpose of this afternoon, I just want to broaden the discussion and look at the subject from a different perspective.

Professor Frankel ends by saying "Only by facing the realities of this impending technological revolution in shipping will we be prepared to face the 'brave' future world of shipping." I am tempted to ask to whom this statement is directed. Certainly not the legal profession, who have assiduously avoided all projected responsibility for technological development, relying as they do on the comfortable process of litigation and precedent.

Even when there are formal marine investigations into serious casualties which occur very infrequently, there are still a number of countries which do not have any administration to carry them out. The feed-back we received when conducting our survey into our Memorandum on Maritime Safety was that casualty data was a private matter between the interested parties, who are primarily concerned to minimize their costs. The public interest in attempting to stop a similar accident from happening again is not the responsibility of the judiciary. In shipping, unlike aviation, the result of this formality is that there are few performance standards for ship and equipment reliability, no penalties under some flags for failure to provide properly qualified officers on board, and a very weak international system for enforcing safety standards.

So where is the thrust for new shipping technology to come from? In the past it has come from shipowners responding to the challenge of an expanding market at a time when finance was freely available. The 1960's saw a rapid diversification of ship types, huge investment in container transport and the planning of the ULCC, the Ultra Large Crude Carrier.

Then the United States suffered a number of serious pollution incidents, culminating in the Argo Merchant casualty in December 1976. The Carter Administration acted swiftly to raise tanker safety standards and, helped by a strong electronics industry, directed a two-pronged attack on tanker construction and management, on the one hand, and more sophisticated navigation and computer-controlled radar systems, on the other.

These recommendations were put through IMCO in haste and are now part of international conventions. Their provisions apply to all ships and in the end the consumer will pay. In the first example about diversification of shipping, the owners paid for the developments. In the latter case we can see that the main burden of development for navigational aids was carried by the equipment manufacturers.

Now, the situation is quite different again. There is a tanker surplus estimated to be 100 million tons d.w.t. The bulk market, already hopelessly over capacity, has been further weakened by the ordering of 180 Panamax bulk carriers to carry coal. One every few days at 30 or 35 million pounds a time. The bulk market has been exploited and the emphasis is on scrapping and reducing costs in the field of manning, engines, propellers, hull roughness and energy conservation. At the moment there would appear little chance of recovering an investment in high technology on this class of ship.

A number of countries, notably Korea, Japan, Brazil and Spain, have invested heavily in shipbuilding. The politics of unemployment mean that European yards are forced to provide a scale of government subsidies to stay open. There are signs that British, Japanese, German and Scandinavian yards are seeking to provide ship designs which will enable an owner to buy ships which are more economical to run than past generations, but the ship-builders have no direct contact with the crews which will man the ships and it is not possible to overcome this problem yet.

I will emphasize this point that it may now be more logical for the shipbuilder rather than the owners or government, to specify the education and training requirements for the ship's crew of the future.

The argument against this logic is that operating ships is a management function and that a good company profits from its intimate knowledge of a trade. I think this could happen irrespective of the training antecedents of the officers and crew. Most personnel policies hinge on remuneration and the political and institutional measures which have grown up around the owner-union axis.

Most developed maritime nations now have an independent marine educational scheme, a system in which the government licenses, the owners employ the crews, and the unions negotiate the conditions of service. Historically, these bodies are independent. They are producing personnel for national fleets which may comprise mixed ships of varying ages and specializations.

It takes about ten years to train a competent chief officer familiar with all the contingencies he may be called upon to handle. On the other hand, a ship can be built in one year and then operated for twenty. It is sad that, in an industry where productivity is already exceptionally high, the economic conditions in world markets should force a more relentless reduction in labor.

The following table illustrates the nature of the problem. Although eastern crews are well paid, the operator who may not pay pensions keeps them at sea for seven months before relief, as opposed to four, saving nearly 50 percent on the wage bill, or a saving of 1/4 million pounds per ship per annum over similar manning in the U.K.

Country	Company	Dead Weight	TEU	Total Crew
Korea	National		1,600	36
Israel	ZIM		1,700	31
UK	Furness Ocean	16,300 20,800		29 31
Netherlands	Nediloyd Nigoco	12,000 14,700		22 22
Denmark	Maersk DFDS	29,391 7,900		23 20
W. Germany	HapagLloyd	13,700		18
Japan	NYK K Line MOL	29,710 29,000 29,888		18 18 18
Taiwan	Evergreen	28,900		18
Norway	Klavness	26,750		17(23)
Sweden	Brostroms	12,000		16

Source: Gaffney M.E., MTRB, US Academy of Sciences, Washington, D.C.

As crew sizes diminish to the level of 12 or 15, the percentage of total operating costs paid to the crew will be relatively small, and we can expect further advance in revolutionary system of design. For the moment, however, the most important operational cost item is manning.

I very much like Professor Frankel's reference to robotics and believe that there is a future for changing maintenance and monitoring aboard ships. Having spent time at sea on the Stena Seaspread with divers under saturation working round the clock at a depth of 450 feet in the North Sea, I believe it is quite evident that remote control techniques are reliable and effective.

As a seafarer, however, I still believe that there must be a competent officer on the bridge at all times. The unexpected, and therefore the unpredictable, still occurs. Tests on the Wahine, a passenger ferry which struck rocks entering Wellington Harbour in New Zealand on 11th April 1968, indicated that in

certain conditions of following sea her propeller and rudder came out of the water, leaving her exposed to broaching. Freak waves off the South African coast have sunk and badly damaged many ships with little or no warning. Tests into the sinking of the trawler Gaul indicated that such vessels can be rolled over by steep-sided waves and swamped by stern seas, if held by the drag of fishing nets. In the case of the München, lost with all hands on 12th December 1978 in the Atlantic, there are two theories. One is that she was swamped by a freak wave from ahead; alternatively her cargo shifted. Whilst on the topic of the unexpected, I must emphasize that personnel still fall overboard with alarming frequency.

Another area where many technologists question the wisdom of the mariner is the field of ship control from the shore. Many people would like to see ships neatly stacked like aircraft and a clear run in provided for everybody. It is important to discuss these assumptions. First, they imply that the shore station has a clearer picture of the situation than the ship. This is not so. A shore-based radar will not pick up small targets in front of a vessel in rough seas twenty miles off-shore. More immediately, a shore station cannot advise a master how to navigate his ship in a narrow tidal channel. It just does not have the sensitivity to do so. Also, there is often no common language between ship and shore, although efforts are being made to improve this situation.

The approach we have adopted in our Institute working party on this subject is to confirm that those on board control the ship, whilst those ashore give "informatory control" -- relating to safety and queuing and "procedural control" permitting vessels to proceed. The introduction of vessel traffic services provides a challenge for technology, but it is not that of the aircraft industry. My advice to any port authority seeking to maximize its revenues, consistent with navigational safety, would be to try out its options on a simulator.

Marine simulation has gone through a fascinating period of development. The targets move so slowly that for authentic "feel" the visual display has to be "drawn" in considerable detail. The cheaper alternative is simply to work with ship lights at night.

Most simulators are used for coastal navigation exercises and bridge team training. Some are used for research into instrumentation design, estuarial channel design, human factors studies and other ergonomic applications. I know of a number of collision incidents which have been simulated after the event, and in one instance with the information accepted by the court it was proved impossible for the two ships to collide!

With the arrival of INMARSAT, communications are going to change and Professor Frankel is right to point out the potential of satellites for improving the flow of information. At the same time, we have desk top computers which can also be taken to sea. Because of these devices, there is a sense in which the necessity for increased data exchange between ship and shore has been obviated. Anybody concerned with management information

services must now be much more aware of the scope for using electronics, communications and processing equipment. As with the standard computer printout, bad design will produce too much information.

The people who really inhibit the use of electronic transmissions of shipping data are our friends in the legal profession! Mention bills of lading and you can almost here the quill pens scratching away!

There is, however, a new problem which needs urgent attention, and that concerns a shipowner's liability if he is in possession of information which affects the detailed running of a ship. Let us take an example concerning bunkers, where the owner is informed on a daily basis of the fuel on board, the owner decides to divert a ship, and she subsequently runs out of fuel. Can he under these circumstances limit his liability for crew negligence? I think it would be prudent for owners and their legal advisers to consider this as part of communications now.

I am prompted to respond to Professor Frankel's remarks about ship management being an anachronism in today's industrial world and his argument for a more participatory approach. Shipping is a transport business with very specific deadlines. The ship itself is not like a factory, but subject to external threat 24 hours a day, because it is a mobile unit. There was an interesting experiment carried out at Harvard, where groups of people were asked to select marbles as quickly as possible. For the simple colours, the "you take the red, I'll take the green" approach was the most effective. For the mottled marbles with subtle colours a participatory approach proved the most successful. As with the conduct of an orchestra, there is still a requirement for command at sea and an acceptance that the master's decision is final.

In this short commentary I have indicated that there is a growing pressure between conservation and expediency in the loosely-woven international shipping industry. Many traditional institutions do not see it as their job to accommodate technological innovation, and this is particularly true of those organizations which exist in a negotiating and regulatory framework. The idea that professional institutions should take a lead in defining the training requirements of their members is quite alien to an industry which has relied heavily on government certification for its safety provision. In the Nautical Institute we fully support the IMCO convention on standards of training and watch-keeping, but we also recognise that it has limitations, in so far as the business side of shipping is concerned. We use the basic certificate as a standard of membership and then develop the professional side through our journal, meetings and conferences.

Our founder fathers in 1972 tried to avoid the limitations of attaching the aims of the Institute to ship masters. Instead they chose the primary objective of "promoting a high standard of knowledge and competence amongst those in control of seagoing craft." Our nautical discipline encompasses deck officers,

masters, pilots, harbour masters, fleet managers, superintendents, surveyors, examiners and educationalists, and we have a large companion membership of engineers, naval architects, lawyers, equipment manufacturers, social scientists and the like.

I appreciate this is bordering on the bounds of commercialism but I do hope that, should any delegate at this conference want to communicate at a professional level with qualified mariners who are mostly in operational positions, you will not hesitate to contact us. We are, as you would expect from this address, a mixture of the modern and the practical. For example, we find it quite unacceptable that the international shipping community has boxed in the master of a ship by legal penalties for everything from pollution to health, cargo obligations to safety provisions, without providing the master with equitable access to redress.

With a view to the implementation of the UN Convention on the Law of the Sea, we are concerned to inform marine administrations about the problems of surveying and policing large stretches of water. Because we have naval members, we can provide information about techniques, vessels and or aircraft and the organization to provide effective service. On the technical side, we are currently conducting a survey of design faults, which include the serious weaknesses in certain OBO's and Bulk Carriers to a bathroom discharge exactly under the pilot ladder stanchions.

I would like to conclude by thanking Professor Frankel for his paper. The warning he gave us is quite clear, that under the intolerable burden of legislation provided by most of the delegates to this conference, ship operators would benefit far more from innovation and I think he is right. However, I would close by asking Professor Frankel, how he would specify the benefits of technology to the shipping industry, and what changes in the accepted pattern of shipowning he would like to see to achieve his ends?

THE TECHNIQUE OF TECHNOLOGY ASSESSMENT:
A COMMENT

Harvey Silverstein
Maritime Technology
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I wish to make some comments about technological forecasting. Because this kind of assessment is so difficult, we must try to learn as much as we can from the past. Let me begin with one such lesson.

Back in the late 1800's they had a problem with many ships, particularly true in northern Europe. The problem which was rather common was known as leaking. Many of the ships had to carry members of the crew just to man the bilge pumps to keep the water out of the bilges, so that the ship could keep going. It was a rather labor-intensive kind of operation. They had various types of pumps and mechanisms, and so on.

One innovator from Holland, where many maritime innovations have originated, came up with the idea of putting a windmill on a sailing ship to operate as a pump to pump out the bilges. This particular technology turned out to be an extraordinary success. The windmills were so effective that they could either lower the crew requirements or put the men on other duties on board the ship. It also enabled shippers or shipowners to use more and more outdated and leaky ships, because the pumps were really effective.

What finally happened, by way of human response to this technology, was rather interesting. Within a few years, the word spread first among sailors and then among the shippers themselves that to put men or goods on a ship with a windmill on it was very dangerous undertaking, because these were the ships in the worst condition. Even though they had good bilge pumps, everything else was deteriorating and the loss rates were high.

I found Professor Frankel's papers to be an extremely sophisticated, very careful, scientific analysis. It is also a perfect example of what can be called straight line extrapolation. The first thing I do is take his microphone so there will be no response.

We'll make a simple graph. The horizontal axis is time. The vertical axis is technology development. It can be any kind of technology. It can be hull development, propulsion development, navigation. What he does, and does extremely well, is discover the trend line in a particular technology, and then extend it, carefully, precisely, as far as he can. In other words -- the words of systems analysis -- he chooses to focus on "subsystem evolution": the slow, careful extension of existing tendencies in technology.

My approach is totally different. When I look at technology and technology assessment, I look upon it as an art rather than a science. I think this goes back to my Rumanian grandmother from Transylvania, who had some unique psychic gifts

at foretelling the future. I don't profess to have such gifts, but I think what she has shown me is that in many cases predictions can be as reliable, perhaps more reliable, if they are idiosyncratic rather than Socratic. Rather than the Socratic Delphi technique used by Professor Frankel, I think we need to look at some other factors. If we look at the shipping industry, perhaps I can give you some examples of what I have in mind.

A number of years ago I finished a very extensive study of IMCO. I could tell you everything about IMCO (now called IMO) from what the secretary general had for breakfast to the names and backgrounds of the Liberian delegation from 1958 onward. I actually developed a computer system and computerized ten different sets of data about the organization. My overwhelming conclusion from all this was that the single most important factor affecting IMCO's responses to technology -- its promotion of SOLAS, MARPOL, and other agreements -- was accidents: unpredictable events ranging from the terrible epidemics in the 1880's, which led to the first International agreements on quarantine, to the sinking of that famous unsinkable ship, the Titanic. (The victims of the Titanic were buried less than a mile from where we are sitting.) It was that single accident which probably accelerated that first SOLAS agreement, more than any other in maritime history.

Another dramatic development that is already having an impact on maritime technology, creating a discontinuity in a line of technology, also happened not far from here about three months ago. That, of course, was the Ocean Ranger disaster. In the case of the Ocean Ranger, one of the largest, most sophisticated drilling rigs, was in a heavy, 60-70 foot storm, when a wave broke the window in the control room. Apparently -- and this is not yet confirmed -- because of the flood of waters into the control room, the ballast mechanism did not function properly, the rig turned over, and 87 men lost their lives. So I would say that rather unpredictable events have formidable impacts on the evolution of technology.

A second factor in technological change is the role of Individuals. Here again one individual pursuing one particular idea, or line of thought, in some cases can change the line of human history. One name in shipping that's very famous is the name of Ericsson. Not only was Ericsson the designer of the Monitor, which helped bring about the rise of steel-clad ships, he was also the designer of one of the first effective submarines ever built. It sank, but it still started a line of development which has culminated in the nuclear submarines. (Nuclear submarines, by the way, are largely the result of one man pushing the concept as hard and as far as he could through the Navy and Congress of the United States. That, of course, is former Admiral Hyman Rickover.)

One other individual who again had a dramatic effect, changing the trend line in the field of maritime commerce, was Aristotle Onassis. I don't have to go into detail about his buying of tankers and ship futures during the Suez conflict and what effect this had on the whole world of tanker development.

What interests me most is what I call "jump shifts" in technology. These are the developments which have such formidable impacts on the industry that they actually change the structure and the operation of the industry itself. They lead to "systems transformation" rather than "subsystems evolution", a somewhat different way to approach the whole question of the effects of technology.

Perhaps the best example of "systems transformation" in the world of shipping is the current revolution in monitoring technology. It is now technologically possible to sit in front of a computer screen and follow any ship going anywhere in the world, 24 hours a day in real time. In this way the monitor can not only identify the vessel but also store information, so that you can actually follow its history over a period of months or even years. That technology exists and is now being used every day by the Defense Department of the United States to follow not only surface ships but also submarines, which have been designed specifically to evade detection.

In fact, the Defense Department is not only spending billions of dollars to take the information gathered by its sensors -- and these sensor nets are deployed worldwide all over the oceans in bottom mounted cables and a variety of other ways -- but it is also spending millions to get rid of the information collected on surface ships, because it's not interested in surface ships. Its interest is in Soviet submarines. So they have complex electronic filters to filter out the noise of all of these other merchant vessels, ferries, everything else, so they can follow the submarines themselves. A submarine, by the way, is several orders of magnitude more difficult to follow than a surface ship. Yet this ability to follow surface ships everywhere they go in the world has tremendous commercial implications. With it, we shall be able to choose routes much more efficiently, for example. We'll have total, or almost total, knowledge of the competition. We will be able to develop histories and patterns for ships and trade routes in the moving of goods as well. It makes possible much better and more effective regulation of vessel traffic. You know as well as I do that wherever the technology goes, the lawyers are soon to follow! If they have the capability to track down ships that are involved in pollution incidents and accidents they'll use it. This kind of technology will give them that kind of capability. It also makes rescue operations that much more effective and sophisticated. I think this is one area of technology development that is going to bring about, and is bringing about, a system transformation in the conduct of maritime commerce.

There's a second area that I'd like to call your attention to: cryogenic electric motors. This is simply a special kind of electric motor that is cooled around the temperature of liquid helium. These motors have an extraordinary ability. They have no electric resistance within them. So they're many, many times more efficient than any other type of existing electric motor.

Fuel cells are simple devices, which combine hydrogen and oxygen to produce electricity. There are now fuel cells being deployed which are large enough to run major metropolitan generating stations in about 98 different places within the United States. There's a very large test going on for a particular kind of fuel cell technology.

The important point here is that you can take hydroelectric power and produce a fuel which you can burn just like natural gas.

Of course one other interesting source for the hydrogen is in OTEC, or ocean thermal energy converters, which could act like mid-ocean filling stations for ships utilizing this technology. Again, some of my colleagues look at me and scratch their heads. Right now sitting in Annapolis, Maryland, after successful field tests by the U.S. Navy, is a cryogenic electric motor powered boat that has been developed and is being tested by the David R. Taylor Naval Research Facility. They have found that it is surpassing all expectations. The reason for developing this kind of technology is that it is incredibly more efficient than any diesel fuel burning, any normal kind of internal combustion engine or steam engine now in existence. It's at least two to three times as efficient, which means per unit of fuel you can go two to three times as far.

Now this technology is not going to be on the market in the next two years, probably even five years. But it's coming, and it's coming very rapidly. I'm happy to report that a lot of money is going into this technology. There was a recommendation made to the government of Canada by Parliament exactly one year ago that the government of Canada commit one billion dollars over the next five years to develop this hydrogen-related technology.

This particular kind of technology, when applied to ships, has the added advantage of being much smaller in size, much lighter in weight, and it makes possible a great deal more freedom in design configurations. Also, since it has only one or two moving parts, it does not break down. It lasts much longer. It has a much higher record of reliability, according to all the tests which have been done so far.

These two examples may suffice, of that which will lead to "systems transformation" in maritime commerce. I think we need to look at these "jump shift" technologies, so that our social response is one of appropriate and timely preparation rather than our usual response of mere reaction.

Thank you.

DISCUSSION AND QUESTIONS

ERNST FRANKEL: First, I'd like to respond to Dr. Silverstein's comments on technological forecasting. Perhaps my view is based, as he suggests, on short-term forecasting. I don't know if it represents a "straight line extrapolation" or a "let's get on with the job, what can we do next?" approach.

As to cryogenic propulsion, the total cycle efficiency achievable at present is still 20 percent lower than what is achieved with internal combustion engines. In any event, do we really have excess electric power that we can't use in any other way? Some political leaders here in Canada are saying, "We have no excess electric energy in Canada for at least the next ten years." Moreover, there is no market at present for this use of electric power. It may make more sense to use excess electric power -- if it exists -- to convert bauxite into aluminum. OTEC may provide us with an opportunity for the generation of energy in mid-ocean, although it is still at an early stage of development. The primary reason why the US Navy has invested so heavily in cryogenic power generation shipboard has less to do with fuel efficiency than with miniaturization: a cryogenic motor is approximately 1/50th of the size of a normal electric motor.

As to Julian Parker's question, "Who is to pay for research and development?", none of our governments -- U.K., U.S.A., or Canada -- is prepared to put any money where its mouth is. We hear a lot of pious words, but my own university's research in this area is funded by the Japanese and Korean governments! (Laughter) It's a curious situation for a major U.S. university.

As to the problem of accidents, I think we have been remiss in ship design from a safety perspective. One-compartment vessels of modern design are vulnerable. If the compartment is penetrated, the ship is lost. We must make a determined effort to increase the safety of many of these vessels. The vast majority of casualties today result either from hull damage to one-compartment vessels or from exploding tankers. But whereas the latter is really an operational problem, casualties resulting from hull damage to bulk carriers, Ro-Ro vessels, and the like, are the result of faulty design.

CARLYLE L. MITCHELL: I would like to ask a question of Professor Frankel. Often over-capacity and other problems are aggravated rather than reduced by technological change. Here in Canada there are restrictions on innovations in fishing vessel technology which are imposed in order to cure inefficiencies in the industry. How would you comment on the constraints of efficiency on the introduction of improved vessel technology?

EDGAR GOLD: Perhaps we can field several more questions before we ask our panellists to respond.

BERNHARD J. ABRAHAMSSON: My question is addressed to Julian Parker. The training of seamen is very important, but also expensive. How do we recruit people who will stay at sea long enough to give a reasonable pay-back return in service for the training they receive? Furthermore, can such a training also be designed to make them desirable for land-based employment?

JULIAN PARKER: Training is a problem that has plagued the shipping industry for the last 30 years. At this moment, however, the problem of recruitment does not exist in the United Kingdom: we have 600 officers who are redundant and 1,200 ratings who are also without employment. The present educational approach was adopted when there was a shortage of officers. It was argued that you had to offer them an educational package that offered them opportunities equivalent to comparable careers ashore. Now the situation is reversed. We have more than we need for service at sea. If you are asking for a quick political solution, the answer is that nothing is likely to happen. People are holding on to their jobs like mad, to put it crudely.

In the long term, we must pursue a one on/one off approach, as in the offshore industry, where this system works quite well. Seafaring is still a young man's life, and you don't want to reduce the turnover too much. You want to have people able to take command in their 40's, especially in the case of high technology ships. The Navy retires them at 50, gives them their last command around 40. By and large, we'll want to have youngish people in command, and a reasonable turnover rate.

Some people are saying that we should integrate the deck and the engine room. Others say that the engineering function will decline, that the engineer's job will be to design very reliable equipment, so that a minimum number of engineers are needed on-board for maintenance purposes. Still others say that the real way forward is to integrate the crew with the officers to form a complete crew unit. The answer is that there will have to be a mixture of these approaches. Some flexibility and imagination will be required in the corporate boardroom. The United States is in a difficult position because of the orientation of the trade unions. So is the United Kingdom, because of the major differentials between officers and ratings. Norway has more flexibility because of the tradition of beginning a seafaring career on the lower deck and moving up to the officer level. There will be no standard solution to the problem. But I would like to see the companies more involved in personnel development.

FRANK WISWALL: Man bites dog. In a short time the countries which have developed high technology for automation on merchant vessels will want to lower international manning standards, and the LDC's will resist this. This political situation is already beginning to emerge.

IMCO has been criticized for simply reacting to casualties, instead of training to anticipate safety problems resulting from new technology and to have appropriate international instruments in place when they are needed. About four years ago IMCO's Legal Committee re-examined its work programme with this criticism in mind. A number of delegates felt strongly that with the carriage of increasing amounts of liquefied natural gas, it would only be a matter of time before there would be a disastrous calamity, the total ignition of an LNG carrier in a populated area like Halifax or Texas City. It was agreed that this matter should receive attention on a priority basis. Now, four years later, we have just concluded our work. Tremendous effort has gone into it. But the ships that we were concerned about are now laid up!

EDGAR GOLD: I'll ask Professor Frankel now to answer Dr. Mitchell's question.

ERNST FRANKEL: I know very little about restrictions on Canadian fishing boat technology, but I suppose they are no different from what we have in the United States, or at least on the east coast of the United States. Subsidies and other forms of funding are available for replacement, but there is little change in this direction, apparently because of traditional resistance to change. Under Sea Grant auspices we have discussed all sorts of improvements that might be made to fishing boat construction and design, but we can't get consensus. Everyone wants his own boat, the kind grandfather operated. This is really a major problem. I believe we need a complete re-structuring of the fishing industry, in many developed countries, not least as a lead to the developing countries.

Perhaps I might offer a comment on the question of skill in the manning of ships. With the degree of automation installed in almost all large ocean-going vessels, I think there's really no need for watch-keeping engineers. I talk as a former chief engineer with 14 years of experience on some of these beautiful passenger liners. The crew of the future that I would like to see would consist of the two ship operators (the captain and chief mate); a standard operator of machinery (with the remote monitoring devices available today there's really no need to have anyone in the engine room); an engineering crew (whose tasks would be limited essentially to fault finding, calibration testing, and emergency repairs); and an operational crew to attend to other routine shipboard tasks and services. I think we have to provide incentives -- economic incentives -- for re-licensing, upgrading, and so forth, to ensure that seafaring skills and knowledge continue to match the rising level of shipping technology.

Finally, I would like to respond briefly to the questions, "Who is to benefit?" and "Who is to pay for it all?" I think the benefits of research and development in shipping technology are fairly widespread. But if we are to encourage the industry

to become involved in research we must first find a way to change the present disincentives which exist in the government structure and government involvement. Regulations should, I believe, provide, not preclude, technological and operational incentives. I don't see why national and international regulations cannot be redesigned to that end. Only in this way shall we see an interest in technological progress and operational efficiency and get a viable shipping industry to serve our needs.

EDGAR GOLD: Probably we could not conclude on a better note than that. Thanks to these excellent presentations and comments, we have had an interesting afternoon. Shipping panels such as today's are something of a departure from traditional LSI procedures. We believed it was useful to examine some of these technical problems, because they are related quite closely to many of the law of the sea issues which have been debated at LSI conferences for over 15 years. We hope you feel the departure was worthwhile. Thank you, ladies and gentlemen, for your attention, and thank you, panelists, for your contributions.

PART VI

**POLLUTION OF THE ECONOMIC ZONE:
NON-VESSEL SOURCES**

INTRODUCTORY REMARKS

Panel Chairman John H. Vandermeulen
Bedford Institute of Oceanography

Possibly the most profound change that has occurred this century in the relationship between man and this world has been in the way man utilizes his environment. For centuries man did little more than occupy space, exploiting the physical and biological resources but leaving the chemical composition of that environment unchanged. Today he is now capable of manipulating that environment chemically, whether wilfully or unknowingly. That change in man's ability is fundamentally awesome, and goes far beyond anything he may have contemplated in the past. Admittedly, human activity has wrought immense changes before this century. Examples such as the formation of the great deserts of the Middle East, which resulted from chronic overgrazing, or the denudation of the Scottish Highlands forests, spring to mind. But these are conceivably recoverable. However, with the coming of this chemical capability, changes can be effected at all levels of life, from the cellular to the population level. Unfortunately, the resulting pollution and many of its effects seem irrecoverable. We understand very little about how these compounds enter our environment, about their persistence, their breakdown and degradation patterns, and their effects. In fact, in many cases we lack the capability to measure their effects.

The spillage of petroleum from the tanker Torrey Canyon into the waters of the English Channel in 1967 served to alert the scientific community to the impending possibility of other contaminant pollution of the world's oceans. In fact, evidence of pollution impact in the world's oceans is now increasing. Whereas 25 years ago coastal rivers like the Hudson River of North America were thought clean, today this river is closed to sport fishing because of unacceptable PCB levels. In Santa Monica Bay, California, a deterioration of fish fin structure is being linked to contaminated sediments from a sludge area. In Europe, German experts have identified 25 "zones of pollution" in the North Sea; and a broad-ranging study of pollutants in sediments, waters and organisms from Puget Sound has shown a strong relationship between the incidence of certain biological abnormalities and levels of contaminants.

Prompted by these various indications, a number of practicing scientists from the rim countries of the North Atlantic Ocean met last October in Halifax at the OCEAN POLLUTION 1981 Conference to discuss their ongoing studies. In part the purpose of the conference was to take a first step in assessing the current status of chemical pollution in one part of the world's oceans. The ultimate hope was that this conference would be the first in a series of similar conferences, leading eventually to a better understanding of chemical ocean pollution globally. Two points came forward from

these discussions. The first was a general concern over the continued pollution of the coastal areas of the North Atlantic, from various sources. These sources include industrial and urban wastes, dredge spoils and ocean dumping, storm water run-offs, and all classes of contaminants: fossil fuels, heavy metals, and synthetic organics. The second point was that concern over ocean pollution cannot be restricted to a single ocean body, but must be viewed globally. While the giant ocean current systems do dilute areas of high pollutant input, at the same time they redistribute the pollutant to other parts of the world's oceans.

These two points also raise two different specters of ocean pollution. The first is the obvious one of pollutant impact on marine resources. It is a simple exercise to relate chemical pollution to a resource such as a fish stock, and calculate a loss. Perhaps not so obvious is the second specter, that arising out of the trans-global transport of contaminants from one country's coastline to another, for it raises questions about the legal responsibility for the impact of chemical wastes and effluents on a neighbor's marine resource.

These questions require a new partnership -- between the environmental scientific community and the institutional/legal community. The world's oceans have been all-forgiving to man, absorbing and diluting man's wastes since the beginning of time. However, with the onset of our technological age, this benign balance is changing and we need to know the ocean's limits, its carrying capacity, and its sensitivity to our wastes and effluents. The environmental scientist recognizes a threat, but the international scope of the threat requires a broader input, both in its study and in its monitoring. What makes this problem so unique, and so urgent, is the suspicion that ocean pollution is outstripping man's ability to detect, measure, and analyze the phenomenon. Already the analysis for petroleum pollution today is limited to a fraction of the compounds that make up the product. The same applies to the so-called chlorinated hydrocarbons or the synthetic organics group of contaminants, where analysis for the contaminants in environmental samples defies the imagination. The fact is that the sheer number and complexity of chemical contaminants is overwhelming the analytical chemist's capability to deal with them adequately -- the "tyranny of size", as E.D. Goldberg calls it.

Admittedly we are probably not on a collision course that will produce a serious impact on the world's marine resources within the next decade. But, on the other hand, we cannot say with equal confidence that we are not heading for such a collision course within the next two decades. The data simply are not there. But the evidence coming in is certainly disconcerting.

This afternoon we want to take the first step toward that partnership between the scientist and the institutional scholar/policy maker. We have broken the problem of ocean pollution in two halves. During the first part of the afternoon

we will present the scientific side of the issue. Dr. Farrington will discuss the concentrations and kinds of chemical contaminants found in the extended economic zone, and he will outline his concerns with some specific examples or case histories. I myself will then discuss briefly some aspects of the effects of chemical contaminants on marine resources, primarily sublethal effects and those effects resulting from synergistic toxicity. Next, Dr. Champ of NOAA will highlight one particularly troublesome source of EEZ pollution, namely ocean dumping. Dr. Champ's presentation should prove an especially valuable learning experience, bringing together many of the points made by Dr. Farrington and myself.

Following a brief coffee- and tea-break we will then turn to the other side of the problem -- the political/institutional side of it. Dr. Thomas Bick of the U.S. National Wildlife Federation, an ocean dumping expert, Mr. Terence Bacon, Assistant Under-Secretary for Legal Affairs with Canada's Department of External Affairs, and Professor Don McRae of the Faculty of Law at the University of British Columbia, will comment on various points made during the scientific presentations, and attempt to present a political/institutional perspective. Then I will turn to you for your views.

SOURCES AND DISTRIBUTION PROCESSES OF CHEMICAL CONTAMINANTS IN THE COASTAL ZONE

John W. Farrington
Woods Hole Oceanographic Institution

INTRODUCTION

Pollution of various segments of the marine environment continues to be a concern of national authorities, regional authorities, international agencies, and international organizations (e.g. N.O.A.A., 1982; I.C.E.S., 1982; I.O.C. - U.N.E.S.C.O., 1982; S.C.O.P.E., 1982; I.F.I.A.S., 1982), as exemplified by inclusion of this topic as a special session in this conference. In this paper I will attempt a brief overview of the biogeochemistry of chemicals of concern in marine environmental quality research, highlighting issues of importance in physical science for consideration by the legal, political and socio-economic sector of the international community. Rather than attempt to be comprehensive in this short paper -- and most certainly fail -- I will combine discussions of specific examples with general principles drawing heavily on papers by colleagues at a recent conference on Chemical Contamination of the North Atlantic Ocean (Ocean Pollution '81). Companion papers by Vandermeulen and Champ will discuss biological effects and the specific issue of ocean dumping, respectively.

We need to remind ourselves constantly that the oceans are dynamic and exchange chemical burdens with another dynamic system, the atmosphere. An obvious, but sometimes ignored, principle of physical and biological sciences is that the legal, socio-economic and political boundaries imposed by man on natural systems are not recognized by pollutants originating within any given segment of these global political divisions. A brief glance at introductory texts in oceanography and atmospheric research are sufficient to remind us of the complex and rapidly moving systems of atmospheric and surface ocean circulation.

We are all familiar with the more spectacular aspects of ocean pollution as illustrated by accidental oil spills: for example, the ARGO MERCHANT breaking up on Nantucket shoals or the IXTOC-1 oil blowout in the Gulf of Mexico. While these are important considerations, it is the lower concentration level, longer-term chronic inputs of chemicals to coastal waters which are difficult to document and yet, by best scientific estimates, account for most of the toxic and potentially toxic chemicals entering oceanic waters, including coastal waters.

Figure 1 schematically illustrates the situation for petroleum inputs. Table 1, taken from a composite of sources, illustrates the importance of the chronic, dribbling types of effluent releases in terms of total amounts of inputs for fossil fuel compounds. Also, it is quite apparent that accidental

PATHWAYS OF OIL INPUT

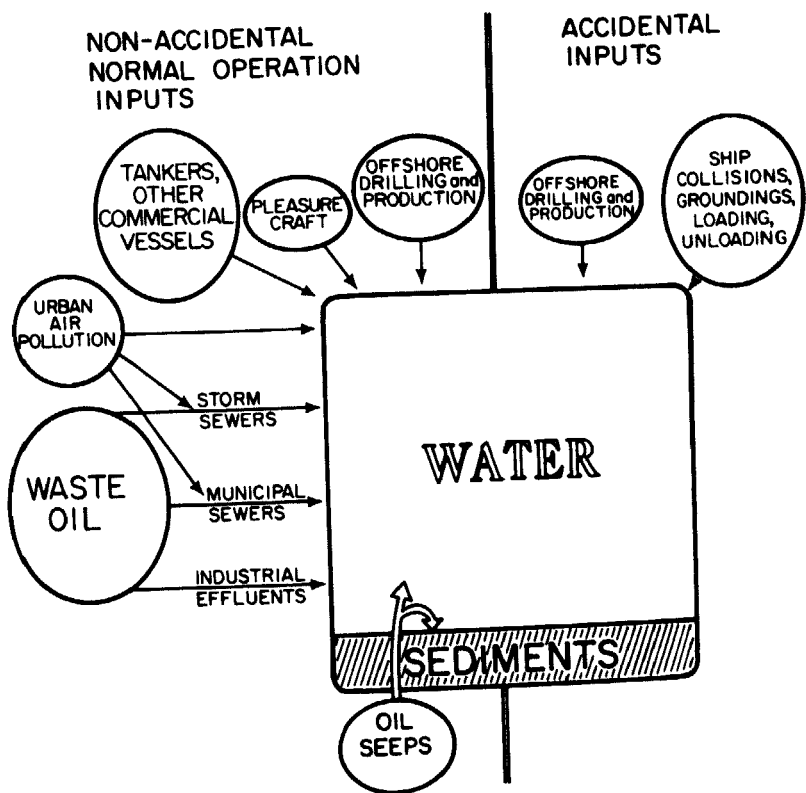


Figure 1. Pathways of Oil Input to the Marine Environment (from Farrington, J.W., 1975, Oil Pollution in the Coastal Environment. Proceedings of a Conference on Estuarine Pollution Control and Assessment. U.S. Environmental Protection Agency, Washington, D.C., Volume 11, 385-400).

Table 2. PCB and \pm -DDT in Deep Atlantic Benthos
(from Harvey and Steinhauer, 1976).

Specimen	DDT	DDE (In parts per billion)	PCB
Rattail Fillet		21.4	0.5
Rattail Liver		381.0	340.0
Brotulid Fillet	1.7	2.2	36
Brotulid Liver	56	1800	1200
Holothurian #1 Body		0.2	0.0
Holothurian #2 Body	0.4	0.1	0.5
Core A-11-85-3-6-(0-2 cm)[1]		0.5	0.3

1 Collected near 25 degrees N, 62 degrees W in 550-5800 m water depth on Atlantis II cruise 85 (September, 1974).

Table 1. Estimate of Petroleum and Petroleum Hydrocarbon Inputs to the Marine Environment.

(millions of metric tons per year)

	World	U.S.
Normal Operations		
Offshore production [1]	0.02	0.003
Transportation [1]		
Load on top tankers	0.31	0.05
Non-load on top tankers	0.77	0.12
Dry docking	0.25	0.039
Terminal operations	0.003	0.0004
Bilges bunkering	0.5	0.078
Coastal Refineries [1]	0.2	0.03
Coastal Municipal Wastes [1]	0.3	0.10
Coastal Non-Refinery Industrial Wastes [1]	0.3	0.10
Urban Runoff [2]	0.3	0.10
River Runoff [2]	1.6	0.53
Atmosphere [3]	0.6	0.18
Natural Seeps [2]	0.6	0.12
Accidents [1]		
Offshore production	0.06	0.01
Tankers	0.2	0.03
Non-tankers	0.10	0.02
	6.113	1.510

1 Estimate with high confidence rating.

2 Estimate with modest confidence rating.

3 Estimate with low confidence rating.

Adapted from U.S. National Academy of Sciences
Petroleum in the Marine Environment

inputs of petroleum are a small portion of the total input even though at a given point in time and for a given location this input could overwhelm the chronic input sources. With the exception of accidents from drilling and an even smaller proportion of ship related inputs, the general input situation for trace metals and organic chemical pollutants is similar to the anthropogenic oil input situation.

BIOGEOCHEMICAL CYCLES (RATES, ROUTES, REACTIONS, RESERVOIRS)

Biogeochemistry encompasses the study of the inputs, reaction rates and reaction pathways of chemicals cycling within and between short-term and long-term reservoirs of chemicals in the environment. This includes the activities of biota influencing the physical or chemical form of the element or compound of concern, or the rate at which it moves through the system. A simplified version of a biogeochemical cycle is given in Figure 2.

Biogeochemical information is of importance to studies of pollution because it provides knowledge of where, for how long, and in what form marine organisms may be exposed to a given chemical pollutant. Knowledge of biogeochemical cycles also provides us with information about possible routes back to man for pollutants discharged to the oceans.

Present knowledge of the biogeochemistry of pollutant compounds in the environment is sufficient to provide an outline of the processes involved (e.g., Figure 2) and in some cases rough estimates of how rapidly the various parts of the cycle are operating. For example, we know that there are three ultimate fates for chemical pollutants discharged to the oceans -- transformation by biological or chemical processes to another compound, exchange to the atmosphere, or burial as a geochemical deposit in ancient sediment.

We also know that the contemporary sediments of harbors and estuaries and some continental shelf areas are temporary reservoirs for a myriad of chemical pollutants such as trace metals, PCBs, DDT and petroleum (N.O.A.A., 1978, Duce and Windom, 1976). Once the inputs from effluents and other land-based anthropogenic sources are reduced, we face the prospect that these sediments will slowly release some of their chemical burdens back to the coastal or estuarine waters over a period of several years or decades. Thus, any estimates of improved resource utilization as a result of pollution abatement action on effluents or restricting the use of specific chemicals requires a realization of the lag period resulting from the continued input of pollutants from the sediment reservoir.

Unfortunately, in many areas of the world, there is now an accelerated need to dredge the polluted sediments in order to maintain or improve harbors and channels. This dredging often results in remobilization of pollutants from harbors and estuaries to other locations in the near shore or on the continental shelf.

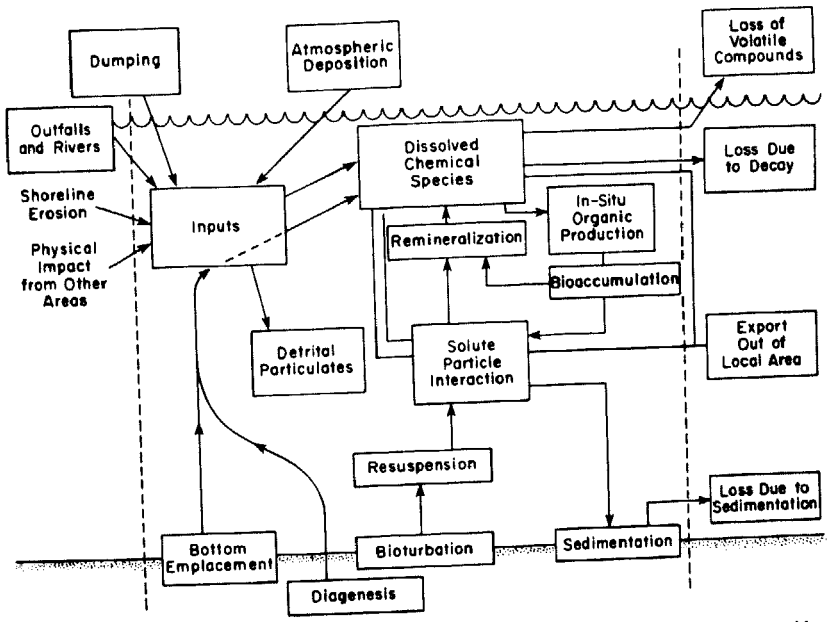


Figure 2. Transport and Transformation of a Pollutant in the Water Column (N.O.A.A., 1978, in references).

The association of chemical pollutants with surface sediments also has important implications with respect to an old cliché: "The solution to pollution is dilution." The problem with this statement is the time-frame of reference and the fact that its proponents ignore the existence of processes in the marine environment which tend to concentrate pollutants, even if only temporarily. The accumulation of chemical pollutants in some benthic ecosystem sediments results in chemical contamination of the local infauna, e.g. polychaetes (worms) and bivalves (shellfish), which can give rise to contamination of bottom fish of commercial importance, thus creating a route back to man for chemical pollutants. In addition, there is the potential for adverse biological effects on the commercially valuable resources, with attendant economic losses.

Contamination of sediment and of bottom dwelling organisms by chemical pollutants is not restricted to nearshore, coastal or estuarine areas, nor even to the continental margin areas of the world. For example, sediments sampled in 1974 from the Nares abyssal plain in the North Atlantic Ocean (Harvey and Steinhauer, 1976) exhibited measurable quantities of PCBs and DDT (Table 2). The area sampled was at a depth of 5,500 meters of water and at least 1,000 km from the nearest land. PCBs were first produced in commercial quantities in 1930 (N.A.S., 1979). DDT was first synthesized by Zeldler in 1874 but was not extensively used commercially until after 1942 (W.H.O., 1976). Thus, PCB and DDT were found in the deep ocean benthic (bottom) ecosystem only thirty to forty years after commercial use on land. It is likely that if samples had been taken prior to 1974, DDT and PCB would have been present. This supposition is based on the fact that fallout from thermonuclear weapons testing of the early 1960's has been detected in benthic ecosystems only ten to fifteen years after release to the atmosphere (e.g. Bowen, 1974; Noshkin and Bowen, 1973).

One likely mode of rapid transport for material from the surface ocean to deep sea sediments is illustrated in Figure 3. Pollutant chemicals associated with fine particulate matter and phytoplankton in surface waters can be ingested by zooplankton and excreted in large fecal pellets or fecal material which can sink at rates of fifty to more than one hundred meters per day. This rapid transit phenomena is not limited to the open ocean area. Recent research off Peru in the active upwelling-rich fisheries area has demonstrated that zooplankton and anchoveta fecal pellets provide a means of coupling surface waters and surface sediments underlying 50 to 400 meters of water in a matter of one or two days (Staresinic et al., 1982).

Thus, we must be mindful of the fact that, once we release a chemical pollutant to the ocean, there is the potential for rapid distribution of the chemical throughout many areas of the oceans. Once released to the marine environment, it may require decades or even centuries for natural removal processes such as burial in deep sediments and chemical and biological transformation to proceed sufficiently to remove unwanted chemicals. With due respect to the ingenuity and resources of a

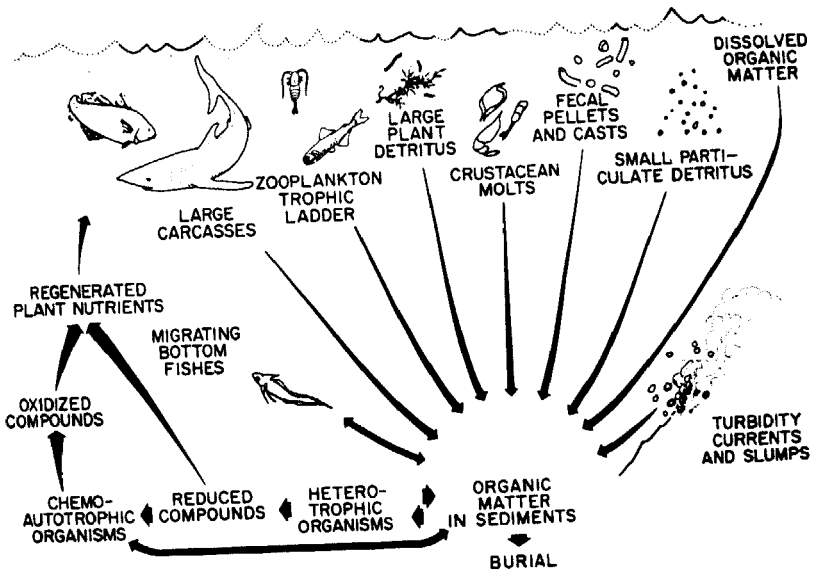


Figure 3. Sources and Transfer Mechanisms for Particulate Organic Matter in the Sea (from Staresinic, N., 1978, The Vertical Flux of Particulate Organic Matter in the Peru Coastal Upwelling as Measured With a Free-drifting Sediment Trap. Ph.D. Dissertation in Oceanography, Woods Hole Oceanographic Institution/Massachusetts Institute of Technology, Woods Hole, MA, U.S.A. 02543).

determined mankind, it would seem foolish to rely too much on anthropogenic manipulations as a clean-up mechanism, given the problems we are facing with hazardous chemical sites on land.

I am not attempting to describe a doom and gloom situation. It is fortunate that the scientists studying marine pollution problems have been able to use, adapt and develop analytical chemical methods of sufficient sensitivity to measure 10^{-6} to 10^{-12} g of chemical contaminants in a gram of sediment, seawater, or marine organism sample: that is, parts per million to parts per trillion. This capability coupled with knowledge of oceanic processes has provided the early warning that allows society some lead time to come to a decision about the relative risks they wish to assume with respect to the world's oceans, and for a nation or region to decide what it wishes to do with a smaller segment of the oceans.

PRESENT STATUS OF CHEMICAL CONTAMINATION OF COASTAL AREAS

The coastal and estuarine areas of the oceans are in close proximity to man's activities that release chemical pollutants to the oceans. Thus, much concern about the present status of ocean pollution has been, and continues to be, focused on coastal and estuarine areas. We can gain some appreciation of the historical aspects of this chemical pollution by examining the record preserved in sediments deposited over the past fifty to one hundred years in a manner analogous to the work of anthropologists and paleontologists (Goldberg et al., 1977). Scientists using this approach have searched for coastal areas where sediments accumulate in a relatively undisturbed manner and can be dated by use of naturally occurring radionuclides of the uranium decay series with half lives of days, weeks and twenty to thirty years. Thus, sediment accumulation rates can be calculated or estimated for a time-span of up to one hundred years before present.

This approach had documented increases in concentrations of certain metals and polynuclear aromatic hydrocarbons from combustion of fossil fuel, which parallel the time course of increasing use due to industrialization and use of fossil fuels. An example for the polynuclear aromatic hydrocarbon historical record is given in Figure 4 for a core of sediment taken from a basin in the fjord-like Pettaquamscutt River estuary in Rhode Island, U.S.A. and compared to a similar time record from a lake in western Europe (Hites et al, 1980). Historical records of the first appearance and increase in the concentrations of PCBs, DDT and other organochlorine pesticides also parallel their known introduction and use patterns (e.g. Hom et al., 1974).

It is important to take note that the predominant source of polynuclear aromatic hydrocarbons in the sediments near urban areas appears to be fossil fuel combustion (Wakeham and Farrington, 1980; Gschwend and Hites, 1981). In some nations, such as the United States, there is a switch in progress away from oil to increased coal combustion for energy and industrial needs. Coal combustion has been shown to produce greater

BaP IN GRÖSSER PLÖNER SEE (ppm)

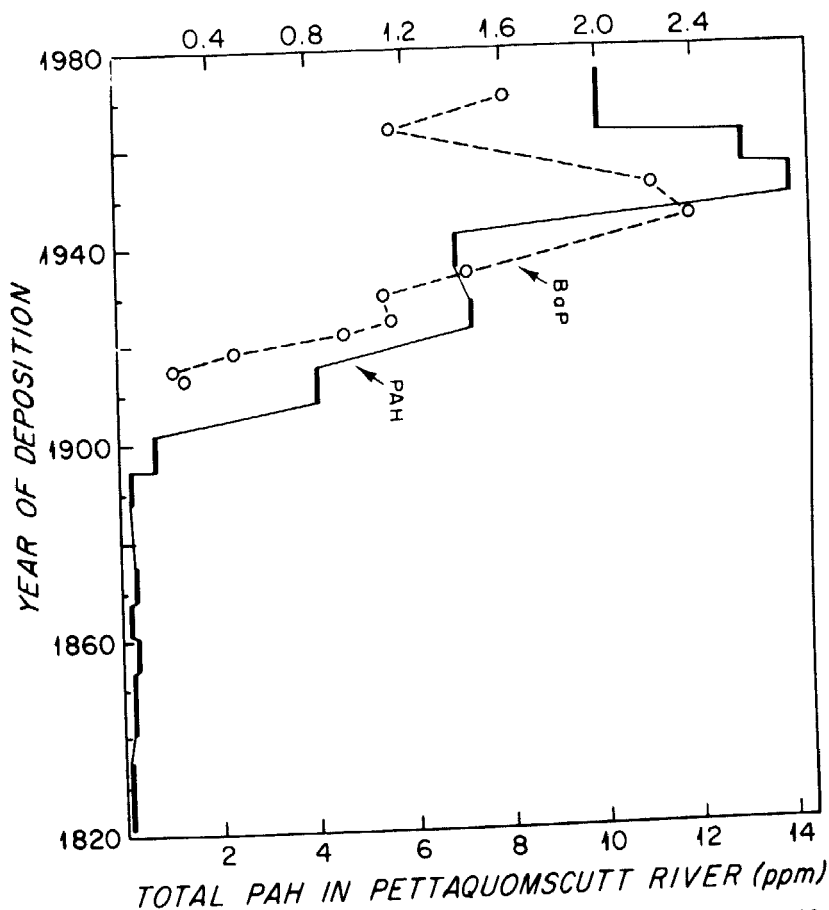


Figure 4. Historical Record of Polynuclear Aromatic Hydrocarbons in a Core of Pettaquamscutt River Sediments (solid bars) and Benzopyrene in a Core of Grosser Ploner See Sediments (open circles) (Taken from Hites et al., 1980 in references).

amounts of PAH per unit energy compared to oil (N.A.S., 1972). Thus, if combustion processes are not cleaned up, then increased coal use could give rise to an increased environmental burden of polynuclear aromatic hydrocarbons, some of which are toxic or known to be precursors (i.e., participate in biological or chemical reactions) of mutagenic and carcinogenic compounds.

The information revealed by sediment analyses about present and past chemical pollution of coastal areas is important to elucidation of biogeochemical cycles, especially since sediments are an important temporary reservoir for pollutant chemicals in coastal areas. However, another important question is the extent to which pollutant chemicals are biologically available. One strategy adopted by several scientists in different countries to assess chemical pollution in the coastal area has been to measure chemical pollutant concentrations in bivalves, particularly mussels and oysters. The rationale for this strategy of sentinel organism approach is as follows (Phillips, 1980; N.A.S., 1980; Goldberg et al., 1978):

1. Mussels and oysters are cosmopolitan species (widely distributed geographically) which minimizes the problems inherent in comparing data for markedly different species with different life histories and relationships to their habitat.
2. They are sedentary and are thus better integrators of chemical pollution status for a given area compared to mobile species such as fish.
3. They concentrate many chemicals by factors of 10^2 to 10^5 compared to seawater in their habitat. The preconcentration makes trace constituent measurements easier to accomplish than they would be for seawater.
4. Inasmuch as the chemicals are measured in the bivalves, an assessment of biological activity of chemicals is obtained.
5. The organisms have low levels or no measurable activity of enzyme systems which can alter the structures of organic pollutants, making it difficult to measure environmental exposure concentrations.
6. There are many stable and extensive bivalve populations which can be resampled in the same locations to provide data on short- and long-term temporal changes in concentrations of pollutant chemicals.
7. They survive under conditions of pollution which often severely reduce or eliminate other species.
8. They can be successfully transplanted and maintained on subtidal moorings or in intertidal shore areas where normal populations do not naturally grow, most often due to lack of suitable substrate.
9. They are often commercially valuable seafood species on a worldwide basis.

We have recently completed an overview of the first three years' data from the U.S. "Mussel Watch" program supported by the U.S.E.P.A. (Farrington et al, 1983). Figures 5 and 6 are

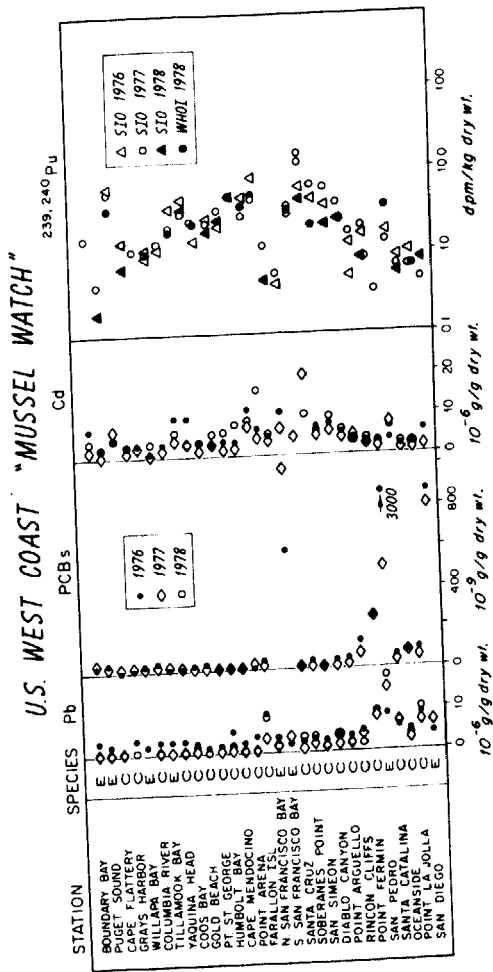


Figure 5. U.S. "Mussel Watch" Program: Data for West Coast (Farrington et al., 1983, in references).

U.S. EAST COAST "MUSSEL WATCH" AROMATIC HYDROCARBONS

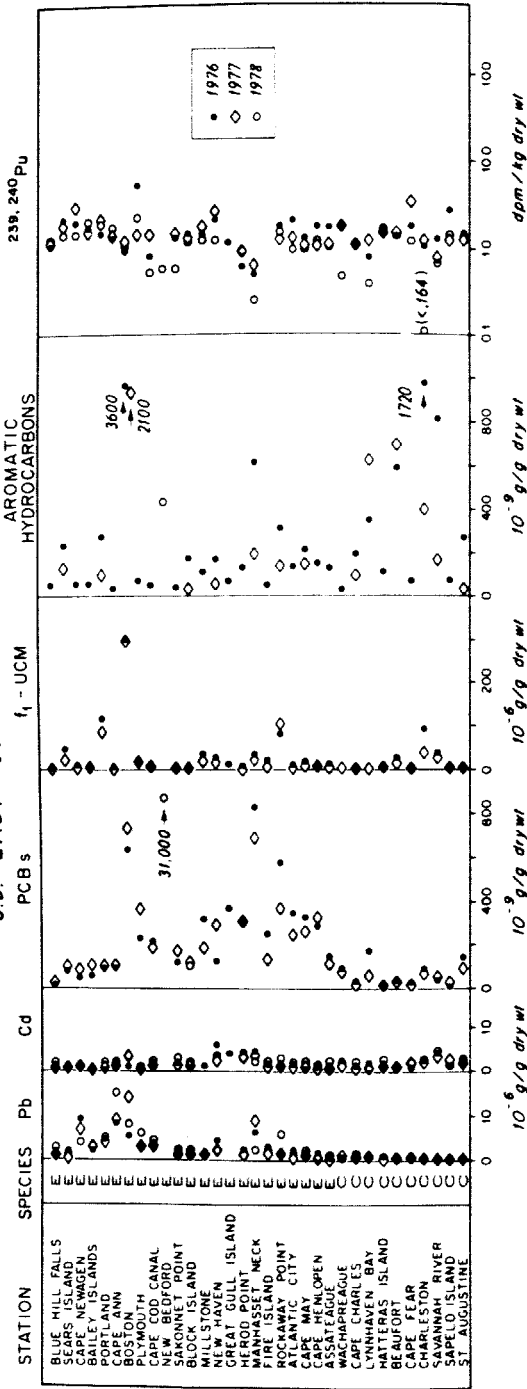


Figure 6. U.S. "Mussel Watch" Program: Data for East Coast (Farrington et al., 1983, in references).

taken from that paper and form the basis for a few important considerations in relation to the topic of this paper.

First, note that lead concentrations are elevated near the urban centers in southern California and also near urban centers of the northeast U.S. coast. Second, note that PCBs are also elevated near the largest urban centers on the West Coast and for the coast of the U.S. northeast megapollis from Washington, D.C. to Boston, Massachusetts. Despite this general coincidence, we do not find a strict one-to-one relationship for elevated lead and elevated PCBs because: (1) the release mechanisms to the environment are different; (2) there is a natural background of lead in the environment; and (3) the biogeochemistry of lead and PCBs are different. It is important to note that both lead and PCBs are subject to regulation and restriction in the United States, which are intended to limit their release to the environment. Lead has been reduced in the gasoline in the U.S. and debate continues as to the need for further reductions. PCBs are no longer manufactured in the United States. PCB use in open systems is banned and recovery of PCBs from large contained uses is in progress. These regulatory actions were in effect during our sampling period (1976-1978), yet there is no evidence of reduced lead or PCB concentrations in mussels or oysters sampled along the U.S. coast when we compared 1978 data with 1976 data. This lag in environmental response has a bearing on the point made earlier that these compounds are now in the coastal biogeochemical cycles, and by the best estimates, we conclude it may be another five years or more before there are definite indications of wide-scale reductions of concentrations of lead and PCBs will be seen in U.S. coastal regions.

The data for plutonium isotopes, $^{239,240}\text{Pu}$, offers three very valuable lessons for the interface of science with public policy. First, the data for plutonium on the U.S. West Coast (Figure 5) shows elevated plutonium concentrations in the area around the Farallon Islands and the central California coastline. The geographical coincidence of these elevated concentrations with the location of canisters of radioactive waste dumped to the seafloor off the coast, caused some who had access to only these numbers to conclude prematurely that plutonium released from the waste was reaching coastal surface waters. This conclusion was incorrect. The elevated plutonium concentrations are due to upwelling of water in this vicinity and intense phytoplankton production which apparently also gives rise to elevated cadmium values for the same area (Figure 5). Thus, the higher plutonium concentrations in the central California samples are due to biogeochemical cycles concentrating plutonium from nuclear weapons testing fallout in this particular region compared to other West and East Coast areas.

Second, the transuranic radionuclide measurements (plutonium and radiocesium) lead us to conclude that there is no evidence of local or regional systematic elevations of environmental concentrations as a result of effluent releases

from nuclear power reactors. The data are consistent with our knowledge of the biogeochemical cycles of worldwide fallout from nuclear weapons testing. This is, of course, not an excuse for relaxing controls and safety in regard to nuclear power reactor operations.

The third valuable lesson, perhaps the most important to those interested in policy questions, relates to disposal of wastes in the ocean. The attractive feature of ocean disposal of wastes including chemical wastes are the vastness of the oceans and their dynamic nature which are viewed by many as promoting rapid dilution of wastes to innocuous concentrations of potential and real chemical pollutants. The elevated $^{239}, ^{240}\text{Pu}$ concentrations in mussels from the central California coast demonstrate that in some cases, oceanic processes can also act on a portion of a dispersed chemical input -- in this case radionuclides from weapons testing fallout dispersed to the atmosphere and then to the open ocean -- and concentrate this portion in a specific coastal area close to man.

It is important to point out that systematic national and regional surveys were needed to clearly identify the elevated concentrations of cadmium and plutonium in mussels of the central California coast and that interpretation of these data required knowledge of biogeochemical cycles in the marine environment. It also needs to be emphasized that monitoring for chemical pollutants in the environment should be designed to answer specific questions and should be closely coupled with research.

TRIAD OF MARINE POLLUTION BIOGEOCHEMICAL RESEARCH

Research into the biogeochemistry of chemical pollutants has been making significant gains by way of three strategies.

First, laboratory measurements of physical/chemical properties can now be used to give first order estimates of the likely biogeochemical cycles and biological uptake of compounds of a given chemical structure. It is also possible to provide an estimate of the ability of natural microbiological assemblages (mostly bacteria), and marine organisms such as crabs and fish to degrade a compound once it enters the environment. Second, field research has provided an assessment of the present distribution and rates of movement of pollutant chemicals through the oceanic ecosystems. Third, relatively new tools, marine microcosms and mesocosms, are providing a means of experimentation in biogeochemical research which yields valuable insights (Grice and Reeve, 1982). Two analogies should illustrate the relationship of mesocosms to other aspects of biogeochemical research. Mesocosms are to the coastal ecosystems as agriculture research plots are to the farmer's fields, and as pilot plants are to production plants in industry. The value of mesocosms can be illustrated by some data from a recent experiment at the Marine Ecosystems Research Laboratory of the Graduate School of Oceanography at the University of Rhode Island.

An experiment with a radioactively tagged polynuclear aromatic hydrocarbon, ^{14}C benzanthracene, was conducted to follow the fate of this compound in this simulated estuarine ecosystem. Benzanthracene is found in petroleum and products of fossil fuel combustion. It was possible to trace the movement of this compound through plankton, zooplankton, water column, and into the sediments. It was also possible to trace products of its metabolism and note how long it took for these compounds to be mixed into sediments (Hinga et al., 1980). This type of experiment could not be done in the natural estuarine environment because of the need to release relatively large quantities of radioactively labelled compounds to the environment.

Alone, none of the research approaches provide the answers we seek about rates, routes, reactions, and reservoirs of chemical pollutants in the oceans. By combining all three approaches and carefully coupling research and monitoring efforts, we are making significant progress in understanding biogeochemical cycles. However, as will be briefly discussed below, we must always be cognizant of the inherent complexity of nature and our ability to underestimate the result of man's tinkering with the oceans.

PROBLEMS TO CONSIDER

The Open Ocean

There is a natural tendency to look to the oceans for disposal of our wastes, when current practices of disposal on land are giving us so many problems (N.A.C.O.A., 1981). When we consider the oceans, then it is a natural tendency to get the waste as far away from the coasts where people live as is economically feasible from a transportation point of view. However, we need to keep in mind that our knowledge of the open ocean and the deep sea well away from land is more limited than for coastal areas. Furthermore, time and distance scales are such that if we do make an inadvertent mistake, it will not be a simple matter of dredging up continental shelf mud from a nearshore dump site area.

We should not underestimate the ability of oceanic processes to function in a manner which results in concentrating portions of chemicals initially dispersed to the open ocean. The previously discussed plutonium distribution in mussels from the central California coast provides an example. This caution does not preclude consideration of the oceans to receive certain types of waste chemicals and process them by dilution and metabolism.

Developing Nations

The desire of developing nations to attain a level of economic development and improved standard of living could result in an inadvertent escalation of oceanic pollution problems, especially for coastal areas of developing nations (Goldberg, 1983). The example of DDT clearly illustrates the

potential problem. There is a changing pattern of use for DDT in the world. Recognition of environmental concerns resulted in restrictions and control of DDT use in many developed nations, especially in the northern hemisphere (W.H.O., 1979). However, the need for an economically realistic pesticide for malaria control and for agriculture production has resulted in increased use in tropical areas and the southern hemisphere (W.H.O., 1979). Figure 7 taken from Rafatah and Stiles (1972) as adapted by Goldberg (1976) shows the estimated use of DDT in agricultural and antimalarial programs for 1972-1981. Table 3 contains U.S. production and use data including the period of the late 1960's, when concern about environmental pollution by DDT resulted in the formulation of most of the U.S. regulations on DDT use. Table 4 contains data on the estimated DDT requirements for antimalarial programs. It is readily apparent that DDT should still be a chemical of oceanic environmental concern. However, there is a shift of concern from coastal areas of the developed nations of the northern hemisphere to coastal areas of the developing nations, and to the ocean areas of both the northern and southern hemispheres. Similar arguments can be made for many petrochemical pollutants.

Analytical Chemistry Methodology

The need for measuring chemical pollutants in trace amounts in various segments of the world's oceanic ecosystems has given rise to challenges in analytical chemistry. Some very sophisticated analytical methods have been developed and used in different laboratories in the developed nations. An important point for this audience to consider is that problems often arise when data from different laboratories and different nations are compared in an attempt to arrive at an overall assessment of the present state of chemical pollution of coastal areas. It is not surprising to see heated debates about details of analytical methodology, when the results will determine if a given nation is or is not in compliance with international agreements regarding pollution of the oceans. Furthermore, we must explicitly recognize that most developing nations do not yet have the scientific and technical manpower and expertise to employ the more sophisticated analytical methods and to conduct the more sophisticated monitoring programs. This dichotomy of analytical capabilities results in debates concerning what data are required versus what data are feasible, and what are the relative roles of developed and developing nations in regional and global monitoring for chemical pollutants.

Given the expected increase with coastal environmental quality problems in developing nations, as discussed above, this is an issue deserving some attention for the community of scientists, lawyers, and others concerned with the law of the sea. As has been previously stated numerous times in various forums, it is one thing to formulate a program and quite another to carry it forward. Those responsible for formulating regulations or programs need to recognize the scientific limitations in determining a reasonable degree of compliance

ESTIMATED USE OF DDT IN ANTIMALARIA PROGRAMMES
FOR 1972-81 (RAFATJAH & STILES, 1972).

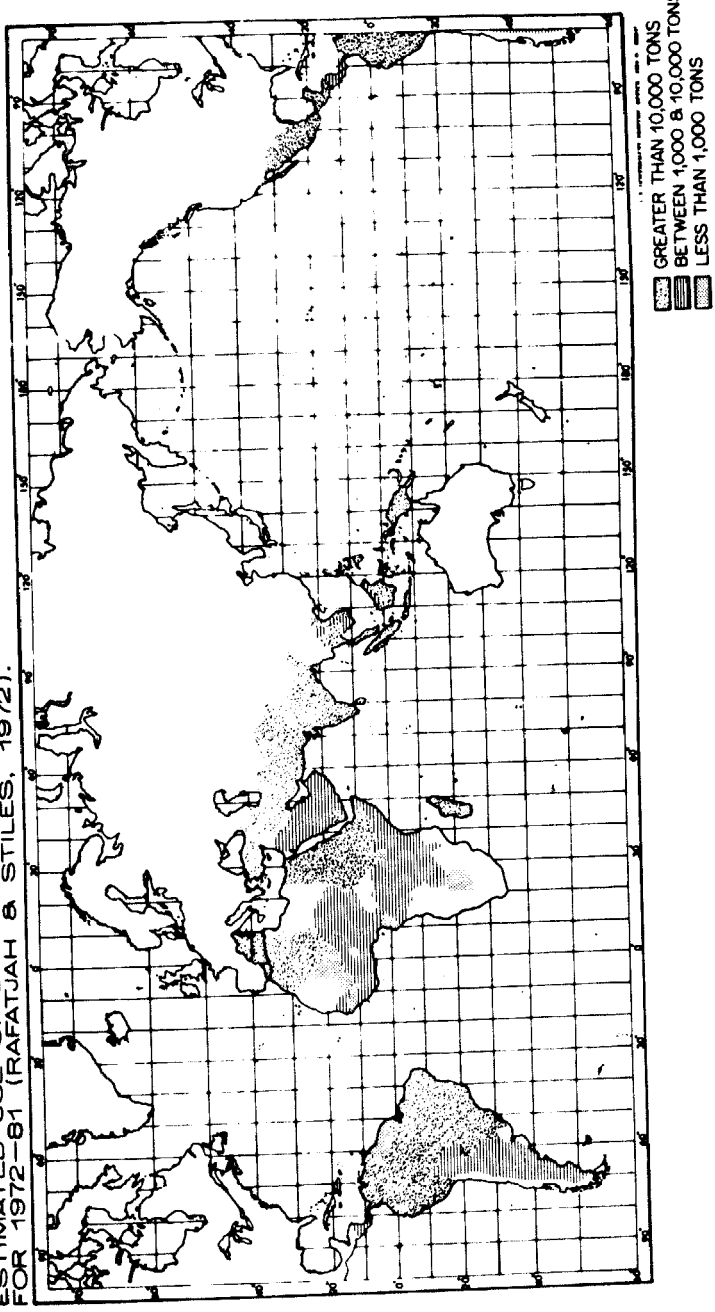


Figure 7. Estimated Use of DDT in Antimalarial Programs (as given in Goldberg, 1976, in references).

Table 3. U.S. Production of DDT

Year	Production
1968	63.4
1967	47.0
1966	64.2
1965	64.0
1964	56.2
1963	81.3
1962	75.9
1961	77.9
1960	74.6
1959	71.2
1958	66.0
1957	56.6
1956	62.6
1955	59.0
1954	44.2
1953	38.4
1952	45.4
1951	48.2
1950	35.5
1949	17.2
1948	9.2
1947	22.5
1946	20.7
1945	15.1
1944	4.4
Total	1,220

Adapted from N.A.S., Chlorinated Hydrocarbons
 In the Marine Environment, United States
 National Academy of Science, 438 p.

Table 4. Estimated DDT Requirements for Antimalaria Program (In tons).

W.H.O. Region	Formulation*	1971	1981	Total 1971-81
African	Technical	62	112.1	1,059
	75 percent wdp	632.4	884.1	8,208.6
	25 percent wdp	100	166.4	1,564
American	Technical	557.1	353.7	5,120.9
	75 percent wdp	11,286	5,325	85,995
South-East	75 percent wdp	16,435.3	12,709.9	217,157.2
Asian	50 percent wdp	8,000	6,000	59,400
European	75 percent wdp	700	200	5,600
	50 percent wdp	500	300	3,800
Eastern Mediterranean	Technical	31	31	310
	75 percent wdp	14,090	7,171	79,627
Western Pacific	75 percent wdp	1,235	2,390	26,678
	25 percent wdp	365	515	6,020
Total (tons)	Technical	650.1	496.8	6,489.9
Total (tons)	75 percent wdp	44,378.7	28,680	423,265.8
Total (tons)	50 percent wdp	8,500	6,300	63,200
Total (tons)	25 percent wdp ec	465	681.4	7,581

*wdp, water-dispersable powder; ec, emulsion concentrate.

Adapted from H. A. Rafatjah and A. R. Stiles, Summary of the Use and Offtake of DDT in Antimalaria Control Programs, Geneva, W.H.O., 1972. (VBC/72.5.)

with regulations. For example, the recommendation for a program of monitoring for oil pollution in seawater has generated debates about what to measure, and how to measure it, ever since the first I.O.C. meeting of groups of scientific experts in 1974. This continuing debate can be seen by comparing the meeting document in 1974 with a recent I.O.C. report by an ad hoc group of experts (I.O.C., 1982). The source of the problem is the fact that petroleum is an extremely complex mixture of chemicals -- as many as 10,000 or more chemicals in crude oils. The debate is primarily between proponents of the less expensive and less specific analytical method, involving a higher degree of uncertainty in the data, and the proponents of the more expensive, highly specific analyses with a greater degree of certainty. The question, cast in legal terms, is whether or not there needs to be sufficient evidence, a preponderance of evidence, or evidence beyond a reasonable doubt. There needs to be much more interaction between scientists, economists, sociologists, lawyers, and others to formulate regulations which make sense, from the point of view of protecting the marine environment for the needs of society and from the point of view of what is realistically attainable in "environmental forensic science."

We need to bring a more realistic approach to the interface between marine pollution research and public policy and regulations without sacrificing the integrity of the scientific method. Too often, scientists find themselves in the uncomfortable position of not having sufficient information to make a prediction; that is, to draw a conclusion which will stand the test of time for an environmental pollution concern. The general public and one's scientific colleagues usually treat predictions in the general field of environmental pollution as based on the precepts of the scientific method. If you do not have data to substantiate a prediction beyond a reasonable doubt, you do not make one. However, decisions often must be made concerning some maritime pollution problems without having all the evidence. Should we allow scientists to make their best estimates if these estimates are clearly labeled as such by the scientists? Should scientists be willing to make such estimates? Some of my colleagues would say that the consequences are too great if a mistake is made with a "guesstimate" by a scientist who has sold out to expediency. My reply is that economists, politicians, and military commanders make their best estimates every day, and the consequences of their mistakes can be as devastating as a wrong estimate by scientists engaged in environmental quality research.

What is the difference between the first group -- scientists -- and the latter group? The latter group of physicians, politicians, economists, and military commanders are allowed to update their predictions on a periodic basis as new information becomes available. Scientists dealing with environmental pollution problems need the same privilege. However, it is difficult for both the public and the scientific community to overcome the "stand the test of time" rule for scientific predictions.

CONCLUDING REMARKS

We all recognize that nature is complex. This very complexity, in and of itself, is not an excuse for scientists to recommend nothing more than further research. We are making progress, step by step, in our understanding of the complexities of the oceanic ecosystems, and in our knowledge of where we can make simplifying assumptions. We can be cautiously optimistic that we have thus far avoided a worldwide catastrophe in oceanic pollution. We should reverse the increasing tendency of complacency toward oceanic pollution by the realization that there have been several local and regional pollution problems in the coastal areas which have resulted in substantial losses of natural resource populations and, tragically, in some cases with human illnesses and even several deaths. (Goldberg, 1976).

As a final caution, I am concerned, as are many others, that our ability to conduct basic research into oceanic processes is not keeping pace with the demands society places on the science. This is not because of a lack of good research ideas, the lack of qualified researchers, or the lack of technology. Rather, it is a function of a decreased willingness of society, or their elected and appointed officials, to provide financial support for such research. This may appear to be a self-serving statement, coming from a research scientist. I will risk this charge rather than stand accused, a few years from now, of remaining silent on this important issue.

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EFFECTS OF CHEMICAL CONTAMINANTS IN THE COASTAL ZONE

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SUB-LETHAL TOXICITY

The underpinning of concerns over coastal marine pollution is the concept of sub-lethal toxicity: that is to say, the occurrence of toxic effects from less than lethal dosages of contaminants. This concept of "sub-lethal toxicity" is actually a fairly recent one, having come more and more to the foreground over the last two decades, as research has given increasing attention to the subtler deleterious effects of toxic contaminants. This is based on recognition that sub-lethal effects can be as devastating as the obviously lethal, albeit much more insidious. In fact, in the environmental scientific community there is general agreement that sub-lethal toxicity may well be of greater significance from the viewpoint of the health of the marine environment (Waldichuk, 1979).

At present there is little evidence, on a broad scale, of sub-lethal deterioration of water quality and of marine resources in the open oceans. However, there are two points of argument that must be raised in caution against this rather comfortable statement. First, there is ample evidence from freshwater systems that sub-lethal contamination can lead to drastic decreases, and even elimination, of fish stocks; and these are not limited to smaller confined streams and ponds. Some of these come from large water bodies, such as Lake Erie (Brown, Shurben and Shaw, 1970). It is indeed conceivable that a fish species, or even population, can disappear completely under sub-lethal toxicity pressures, without any overt symptoms of distress (Waldichuk, 1979). Thus the precedent exists, and it is for us to accept this lesson and anticipate the occurrence of similar situations in nearshore and coastal waters.

The second argument comes from the growing body of sub-lethal effects observed both in the field and in the laboratory. Toxicants such as petroleum hydrocarbons, heavy metals and synthetic organics are known to affect living systems at all levels of organization -- molecular, cellular, organismic, and the population level. Certain petroleum hydrocarbons are known to bind, or interact with, the genetic material of the cell. Heavy metals can evoke abnormalities in fish larval development. PCBs are known to cause a range of physiological perturbations in marine organisms. Urban wastes and effluents are strongly linked to abnormalities in community composition of bottom-dwelling organisms. Although these various abnormalities are not yet a constant occurrence in all the world's oceanic waters, they do occur with sufficient frequency in test situations that they serve as a warning. Certainly many environmental scientists argue that if an effect can be elicited in the

laboratory, then it can be expected to occur in the field. While it is admittedly difficult to extrapolate from laboratory testing conditions to the realities of the field, there is nonetheless a warning in the laboratory results that cannot be ignored.

Finally, there exist already several striking examples of coastal marine contamination that can provide some insight into what can be expected with continued pollution of the more open water systems we are considering today. The erosion of water quality and the massive deterioration of the marine fauna and flora of Kaneohe Bay, Hawaii as a result of population increases, dredging and urbanization, may be cited as one very dramatic example of what can occur over the course of a few years in an embayment that lies very much exposed to the Pacific Ocean (Banner, 1974). More recently, in German waters of the North Sea the incidence of fish disease near sewage and waste dumping sites has increased to the point where further increases in such disease was considered unacceptable from a fish population point of view (Jenkins, 1982). There are similar such examples pointing to the reality of a pollution threat to coastal waters from Santa Monica Bay, from Japan, and other areas.

ECOLOGICAL LC50

Inherent in the concept of sub-lethal toxicity is the notion of the "ecological LC50," an index of sub-lethal toxicity that is relevant to the real world of predator-prey interaction. Many of the tests performed for the evaluation of potential toxicities of contaminants include the so-called LC50 evaluation: that is, the concentration of a contaminant which will result in the death of 50% of the test organisms exposed to the contaminant over a set length of time (usually 24 to 96 hours). While useful as a preliminary screening test, this method has little relevance to the problems of contamination of the marine environment, or for that matter to any aquatic environment, where the rule of survival of the fittest prevails. According to this rule, any organism that has become merely slightly weakened, such as by a less-than-lethal concentration of a contaminant, will fall prey to a predator. Such sub-lethal concentrations which nonetheless result in a lethal consequence occur at concentrations well below the laboratory-established LC50 (see Table 1). In other words, there exists in the marine environment an "ecological LC50" which operates at much lower sub-lethal concentrations than those established in the laboratory under more controlled conditions, and more usually utilized in the monitoring and enforcement of regulations.

The spatial/temporal consequence of this phenomenon is shown schematically in Figure 1. While the exact configuration of the LC50 and "ecological LC50" envelopes will vary with the particular oceanographic and geographic conditions, the scheme illustrates the following points. First, that the dilution of a contaminant below accepted toxicity levels (LC50) determined by

Table 1. Sub-lethal (SLC50) and median lethal concentrations (LC50) thresholds for Pavlova lutheri (Monochrysis lutheri) tested with a range of chemical contaminants. Included are comparative ranking of sensitivities of the two tests.

Contaminant	30-min SLC50*	2-hr LC50**	Order of Sensitivity	
			SLC50 LC50	2-hr LC50 30-min SLC50
1. Petroleum hydrocarbons				
Kuwait crude oil	0.5 ppm	8.57 ppm	5	6
Bunker C	2.0	3.3	7	5
#2 fuel oil	0.05	0.085	2	1
Naphthalene	0.1	2.45	4	4
2. Halogenated hydrocarbons				
PCB (Aroclor 1254)	0.07	0.135	3	3
p,p' - DDT	0.01	0.13	1	2
3. Heavy metals				
Cu++	1.67	14.8	6	8
Zn++	3.33	13.3	8	7

* Concentration of contaminant at which ratio of "tumblers" to "errants" exceeds 50% over a 30-minute test period.

** Lethal concentration of contaminant at which 50% of the test organism is killed over a 2-hour exposure period.

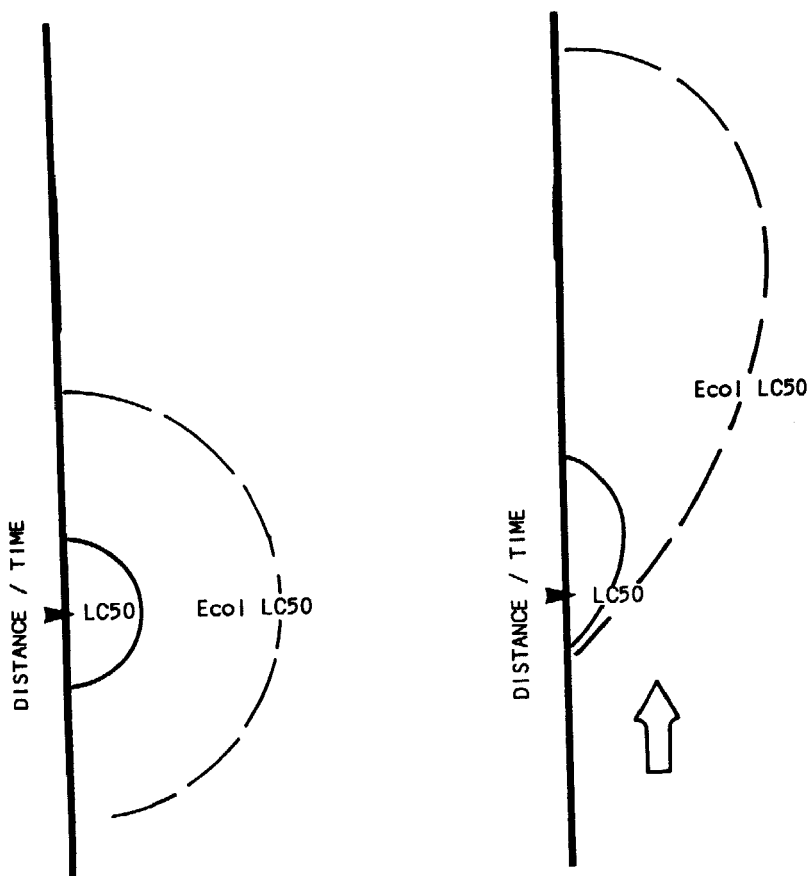


Figure 1. Schematic representation of the relationship between areas containing lethal dosage concentrations of a toxicant (LC50) and those with sub-lethal but ecologically fatal dosages (Ecol. LC50). Right-hand figure illustrates the influence of current on the relative envelopes.

regulatory agencies does not remove the threat of mortality, for those organisms found within the larger "ecological LC50" envelope. Second, under appropriate oceanographic conditions (strong currents, winds) the "ecological LC50" can extend a considerable distance beyond the point-source of the contaminant.

SYNERGISTIC TOXICITY

Few organisms ever remain exposed to a single contaminant, especially in the aquatic environment where contaminants are rapidly transported over long distances. As a result, real toxicity is more appropriately the result of synergistic action of several contaminants exerting their combined toxic effect. Unfortunately this synergistic action almost invariably yields greater toxic effects than if the toxic effects of the individual compounds were added together directly. This is demonstrated rather remarkably in Figure 2, which summarizes the results of a study of the interactive toxic effects between copper and zinc and cadmium (Phillips, 1980). This study clearly indicates the potentiating effect: that is to say, the enhancement of a toxic effect that can occur in the presence of a second toxic compound. Of possibly greater significance is the second observation that the combination of a relatively non-toxic compound such as zinc together with a non-toxic concentration of cadmium can in effect be raised to a toxic combination.

This phenomenon of synergistic toxicity has, therefore, both potential and real far-reaching consequences in areas receiving a mixture of contaminants, even if, taken individually, they occur in low "acceptable" concentrations. By way of example, a broad-spectrum study of the waters, sediments and organisms of Puget Sound has determined a broad-range input of contaminants (including polycyclic aromatic hydrocarbons, PCB's, chlorinated hydrocarbons and heavy metals) into this salt-water arm of the Strait of Juan de Fuca (Malins et al., 1980). The study demonstrated a not unexpected trend toward increased tissue abnormalities near the more heavily industrialized areas of Puget Sound, the cities of Seattle, Tacoma, and Olympia (Figure 3). However, the study also revealed two unexpected features. First, that although major differences are found in the contamination between industrialized/urban and non-urban/reference area, even the further removed reference embayments of Puget Sound were not free of contaminants. This underscores the environmental scientist's concern for the chronic long-term encroachment by contaminants into what are today considered to be contaminant-free areas of the marine environment. The second feature is that in many of the study sites the individual contaminant concentrations were not unexpectedly high. Yet a ranking of observed histological and pathological abnormalities of marine tissues from such sample sites showed these to be statistically different from those at other such sites. This is an example of synergistic toxicity at work.

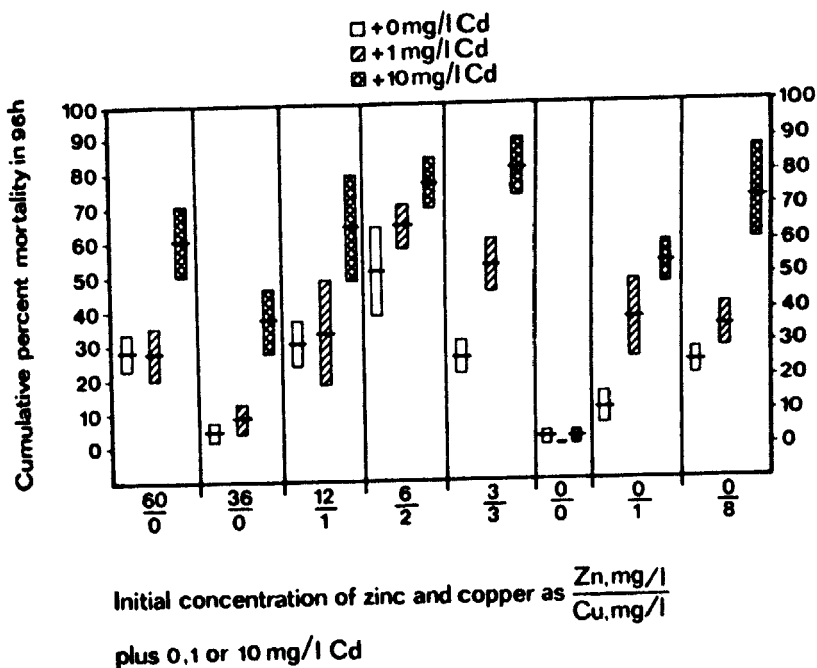


Figure 2. The synergistic toxicity effect of cadmium on the toxicity of zinc and copper to the mummichog fish *Eundulus heteroclitus* (from Phillips, 1980).

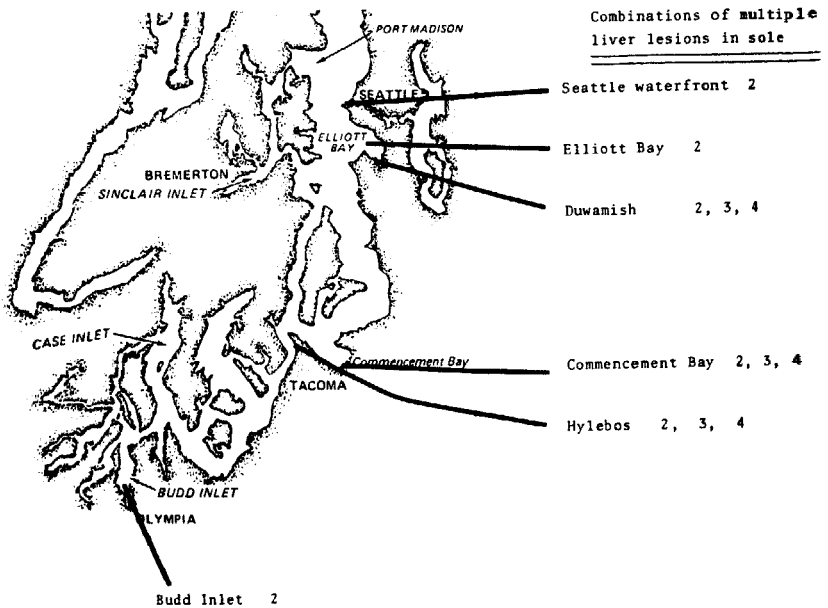


Figure 3. Occurrence of multiple liver lesions in sole taken from Puget Sound sampling stations in NMFS study (viz. Malins et al, 1980). Numbers indicate number of different lesions occurring together in sole liver.

ASSIMILATIVE CAPACITY

This brings us directly to the notion of "assimilative capacity" (or "absorptive capacity") of the marine environment. As has been pointed out, this term has come into accepted usage as a result of demands for locating wastes in offshore waters that cannot be otherwise accommodated on land. Simply put, man is looking for places to dump his wastes, and he wants to know how much wastes the oceans can tolerate. Unfortunately, this concept is based on a rather naive conception of nature, one in which a certain amount of waste causes a certain amount of damage. Inherent in this particular view of nature is the belief that if the assimilative capacity were exceeded, then a simple reduction in the amounts of contaminants released to below the allowable limits will return the environment rather nicely to its pre-waste state.

Unfortunately (or fortunately, depending on one's point of view), nature is not like that. Nature does not have a single toxic response to a contaminant, and the response is not simply additive as we have seen. Recovery is not a direct and obligatory response to the reduction in contaminants. Let us consider some of these points in more detail.

Organisms differ widely in their sensitivity to contaminants, and, to add more difficulties, they also show marked variability depending on the stage of the life-cycle that becomes exposed. Thus larval fish are generally more sensitive to contaminants than either eggs or adult fish (e.g. Figure 4). But this is by no means a hard-and-fast rule. There are extensive differences between species. The life-style also serves as a very significant factor. Many marine organisms such as lobsters have a life-style in which some part of the life-cycle (in the case of the lobster, the larval stage) is spent near the surface of the water column, while another part (for the lobster, the adult and egg-carrying stage) is spent on the mud bottom. These two physical compartments are subject to very different contaminant loads of differing chemical composition.

Finally we return to the question of LC50 and "ecological LC50." When viewed in terms of "assimilative capacity", which is a time-dependent concept, the "ecological LC50" takes on greater significance. But which index of sensitivity do we accept? The complexity of this question is illustrated in Figure 5, which shows schematically the ranges of threshold concentrations for various physiological and behavioral effects (in this case, for freshwater fish exposed to zinc). An alteration in any one of these physiological properties can become an ecological liability for the organism, and this over two to three orders of magnitude concentration of the contaminant.

GESAMP (1980) has taken the shortcut to this question of what is "assimilative capacity" by defining it as that concentration that causes some measurable impact at the population level. That is to say, GESAMP would accept toxicity-induced perturbations in larval development, growth, swimming

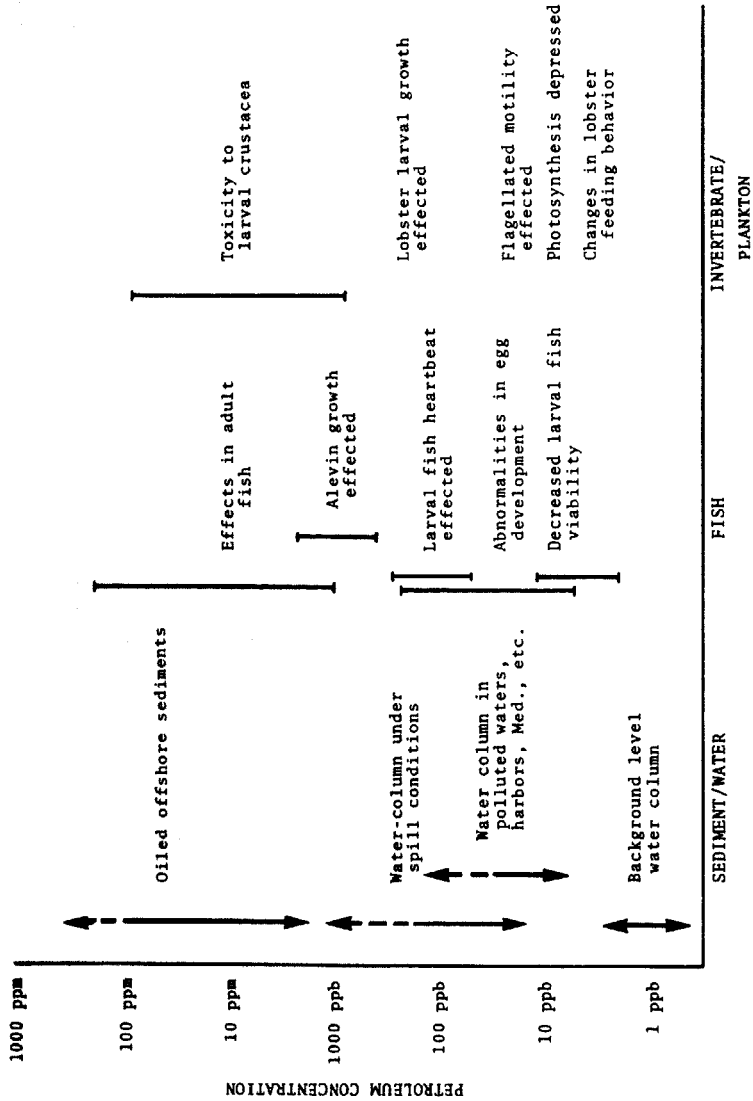


Figure 4. Range of effects of petroleum hydrocarbons on fish, and on invertebrates and phytoplankton.

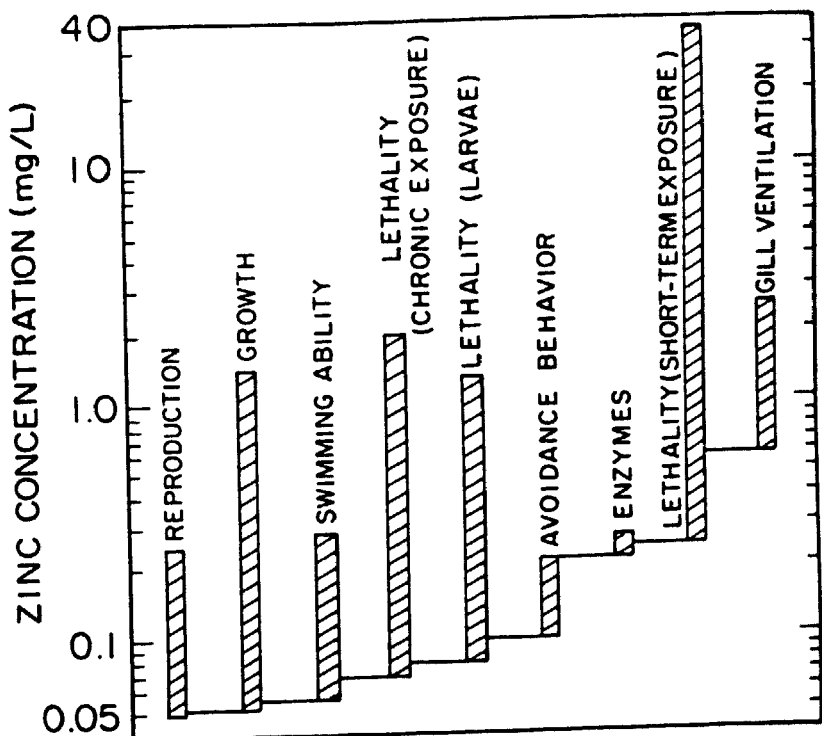


Figure 5. Ranges of zinc toxicity concentrations for different metabolic, physiological and behavioral effects to occur in fresh-water trout (from Phillips, 1980).

and avoidance ability or tumor formation of fin rot, as long as the gross population size is not affected. At first view this seems a very practical assumption, but in practice it would seem to be most applicable to impacts on seabirds, and perhaps to a limited number of fish stocks, for which population assessment is understood and can be done, but inapplicable to the bulk of the marine environment. In any case, many environmental scientists are of the opinion that if a measurable impact is felt at the population level of a marine resource, then the situation has already gone too far. As has been pointed out by Waldichuk (1979), "[t]he (sub) lethal effect is often subtle and insidious, as it may occur gradually over a long period of time. Even careful scientific investigation may fail to identify the cause of a decreasing trend in the fishery until it is too late. Natural fluctuations in fish abundance and changes due to exploitation may obscure a decline in a population caused by a pollutant."

The point I want to stress is that the notion of "assimilative capacity" -- that is to say, the idea of some sort of tolerable pollution level for the coastal zone -- may be attractive institutionally or politically, but from a scientific or ecological point of view it is at best a difficult concept, and at worst a very dangerous one. It may be possible to establish some sort of chemical loading limits for the EEZ, but it is not possible to establish ecological loading limits with our present knowledge.

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A GLOBAL OVERVIEW OF OCEAN DUMPING, WITH DISCUSSION
OF THE ASSIMILATIVE CAPACITY CONCEPT FOR SEWAGE SLUDGE

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On this continent, and in many other places, waste treatment and disposal has become a fairly critical problem. On the face of things, there are three media to dispose wastes in: land, water, and air. In earlier times wastes were usually discarded near the source of production. But gradually we learned of the penalty we were paying for these practices: the muffing up of the land, adjacent streams, and more distant waterways. The next step was to discard our wastes in coastal waters, using longer pipes and greater discharges: "out of sight, out of mind". Now we are starting to discard our wastes in the deep oceans. Since they make up 70 percent of the world's surface, some argue, the oceans should carry some of the burden of waste disposal.

Already the oceans today receive a wide range of dumped wastes: dredge materials, municipal wastes, sewage sludges, industrial effluents, acid and alkaline wastes, pharmaceuticals, various organic and radioactive materials, fish and seafood wastes, coal wastes, drilling fluids, oil research spills, and many other substances. New disposal methods, such as ocean incineration, are being examined, but the problem is likely to get worse as the volume of waste increases. In the next ten years, for example, the United States will change 15-20 fuel-powered electric generating plants to coal-burning plants, producing 9.1 million metric tons of coal waste per year.

All over the world, developed coastal states are dumping their wastes increasingly in coastal and oceanic areas: the European corridors, the corridors off Japan, Australia, Canada, and Puerto Rico. Over the last four or five years the number of ocean dumping permits issued has increased steadily, according to the records kept under the London Dumping Convention (see Figure 1).

Let's look at the global picture of ocean dumping for industrial wastes. In 1976 the world tonnage was about 9.8 million metric tonnes (MT). In 1977 and 1978 it stayed constant at 12 mMT, but jumped to 17 mMT in 1979. The picture for sewage sludge is similar, showing an increase from 13 mMT in 1976 to 16 mMT in 1979. So not only are the permits increasing in number, but also so is the actual volume of wastes dumped.

If we compare the countries producing the bulk of these wastes, we find the United Kingdom in the lead for sewage sludge, followed by the United States. In the case of industrial wastes, the U.S. leads with 28 percent of the world total. (Canada dumped 0.8 percent of the world's total in 1979). So most of the industrially developed nations are looking at the developing countries for less expensive waste disposal because they have less stringent environmental laws.

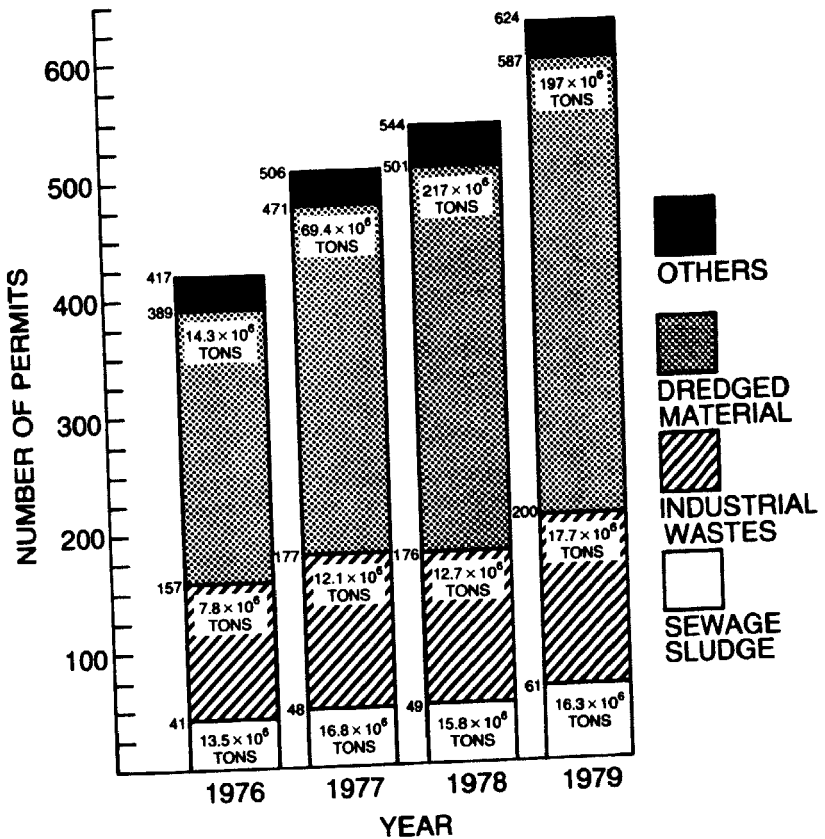


Figure 1. Number of ocean dumping permits on a global basis (as reported to the London Ocean Dumping Convention, for 1976-1979) (from Duedall et al., 1983).

If we look at the total volume of materials ocean dumped, we see that it is about a quarter of a billion metric tonnes per year. The bulk of these materials are dredge materials. In many cases, dredge materials can be as contaminated as either sewage sludge or industrial wastes. The world total of permits for ocean dumping for 1979 was about 587, not including some of the Japanese data, which will increase the total volume about another ten million tonnes.

On the whole, I am inclined to view the disposal problem for sewage sludge as more serious for society than that for industrial wastes. We can create incentives or disincentives for industry fairly easily, to induce them to recycle more of their wastes, or whatever. But for municipalities it is more difficult. Sewage sludge is a product of the commons, and it is extremely expensive to treat and process the volume of human wastes produced on this crowded planet. New York City, for example, spent approximately \$1.5 billion in 1981 in the treatment and processing of sewage. If you add in construction and water use costs, that comes out to about six cents a flush.

This tremendous cost is increased because we use drinking water to flush and transport our wastes. These wastes are then transported by pipelines and pumping stations to waste treatment plants to separate the wastes from this water, all at increasing costs. Somewhere we have lost perspective on how to handle the problem. Yet mankind cannot accept the principle of "constipation". Meanwhile, as most forms of technology improve, the amount of sewage sludge produced rises steadily. In New York Metropolitan Area it is expected soon to reach 9-10 million metric tonnes per year, (see Figure 2).

So, which alternative is best: land, water, or air? To solve New York's problem on land, we would need a land-mass area one-quarter the area of the state of Rhode Island. Apart from the people of Rhode Island, the Food and Drug officials would not allow this waste to be dumped there longer than 13 years, because the nitrogen balance in the soil would exceed what is permitted for agricultural crops. Also the costs for burning and transportation are much greater than for ocean disposal. Small wonder, then, that the ocean is becoming increasingly the focal point for waste disposal.

But which region of the ocean should be selected to receive the sewage wastes of New York? In the New York Bight there are dump sites 12 miles, 65 miles, and 106 miles from shore (see Figure 3). The 65-mile site has never been used: it is only a recommended alternative. It also happens to be a commercial fishing area, but it has the convenience of being half-way between the 12- and 106-mile sites. The 12-mile site has been used since 1924. It is very complex, since many different kinds of wastes have been dumped there. Within the next few years significant legal and policy-making decisions concerning this site will have to be made.

One of my recent responsibilities has been to look at sewage dump sites around the world and try to figure out a way of determining why one site may be better than another. What I

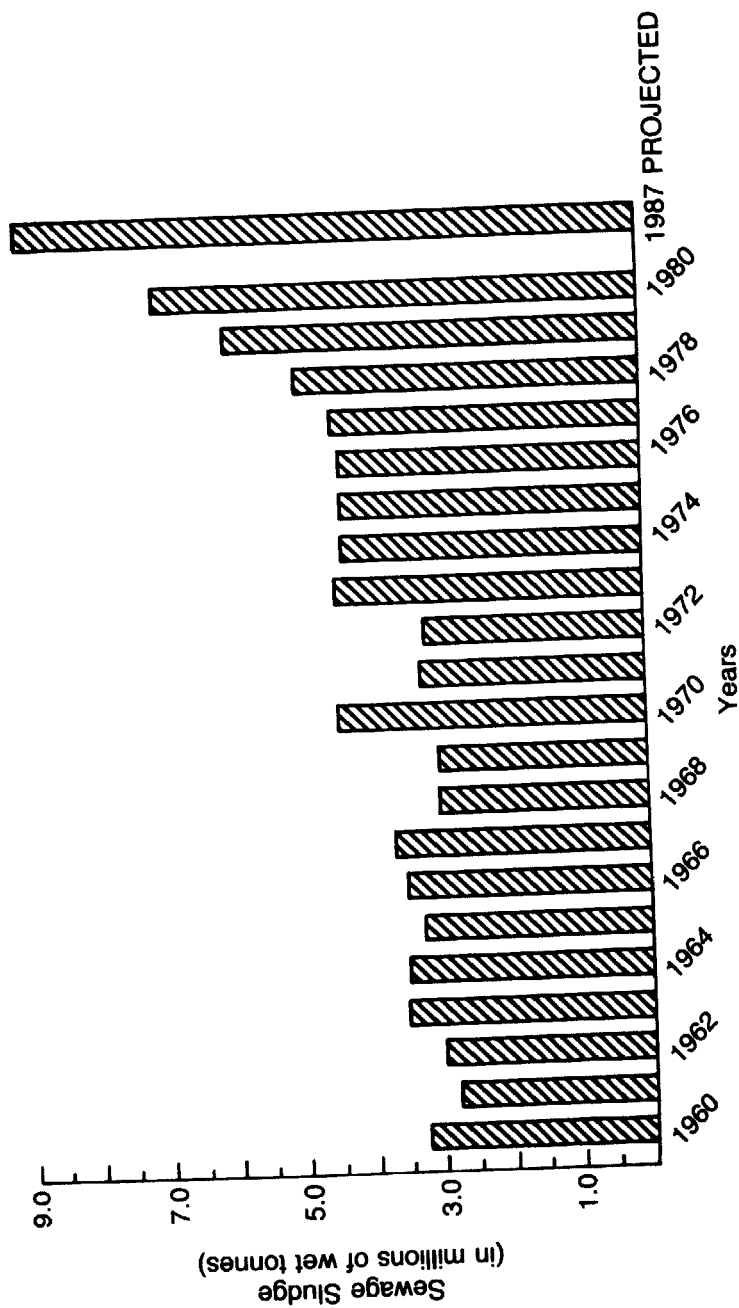


Figure 2. Quantities of sewage sludge dumped in the New York Bight over the past two decades (from Swanson et al., in press).

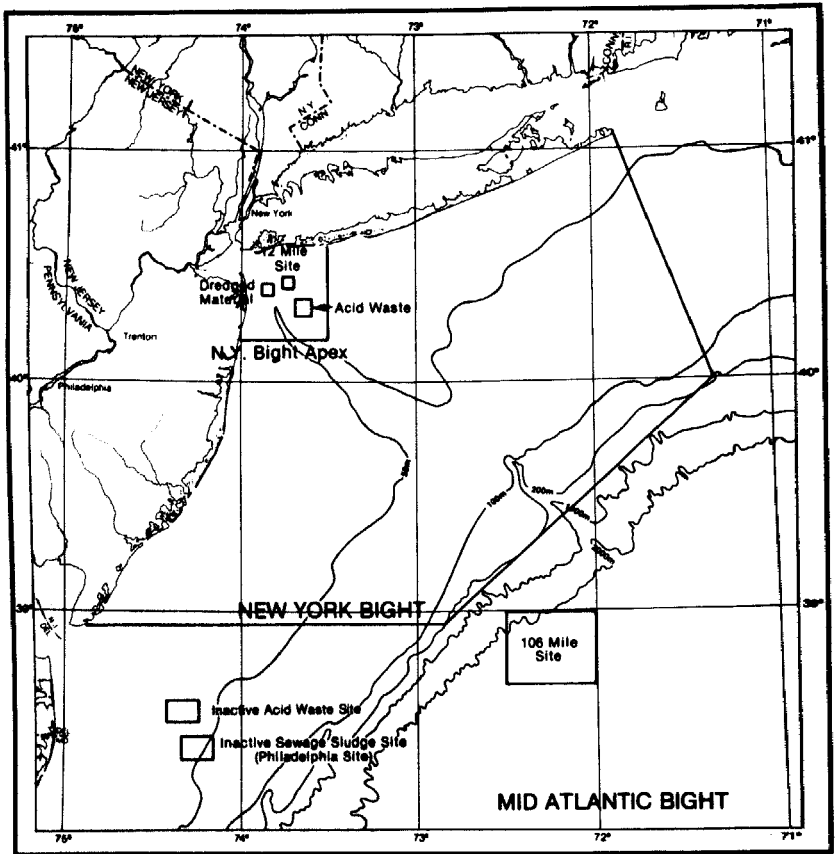


Figure 3. Location of East Coast U.S. Dumpsites.

have tried to do is rank these sites by reference either to the accumulating of the disposing of wastes (see Figure 4). At the top of the graph are the dumpsites of New York Bight and the Firth of Clyde in Scotland, which are more accumulating. All of these sites have different characteristics and different merits for receiving wastes.

The staff of NOAA's Ocean Dumping Program have the responsibility to identify the mechanisms that make one site more advantageous over another, so that policy- and decision-makers can evaluate one site over another, in terms of economic, social and environmental costs. For instance, for three of the sites examined, the annual costs of shipping sewage sludge to those sites have been estimated to be \$3, \$12, and \$18 million. So, there is plenty of incentive to make a decision on site selection.

Now I would like to present an example of how one would predict what would happen at the 106-mile site, if we dumped seven to eight million metric tonnes of sewage sludge there annually for the next hundred years. This site is located off the edge of the continental rise in an average depth of 2,200 meters of water. It is called a "deep ocean" dump site. In studying such a site for waste disposal, we had to determine the physical oceanography of the site. We placed a number of satellite tracked drogued buoys in this area to assess the current flow pattern of the site. Unfortunately for the United States, the current flow is back toward the east coast toward Cape Hatteras, toward the coastal areas that we are trying to protect by dumping far offshore (see Figure 5). The ocean dumped waste will create a waste zone, approximately 500 kilometers long and approximately 50 kilometers wide, that would eventually entrain into the Gulf Stream (see Figure 6). To predict the concentrations of contaminants in this waste zone, O'Connor et al (1983) have estimated contaminate concentrations subsequent to ocean disposal in the water column and in sediments (see Table 1).

The most important kind of study that has not been conducted is risk assessment. This involves looking at the ecological, social and economic factors and doing a cross-benefit analysis of one resource use versus another. For instance, the New Jersey-New York beaches have a recreational value in excess of \$13 million per weekend, for any one of the twelve summer weekends (Long Island State Park and Recreation Commissioner, 1976). Therefore a waste dumpsite twelve miles from these beaches could significantly alter their recreational value. So, the economic values of that site associated with recreation are far greater than they would be for fisheries and out-weigh barging costs.

In the past, legislation for the protection of the ocean from pollutants has been directed toward prevention of pollutant inputs into the coastal waters. This, of course, is expensive to achieve and is basically unachievable. Recognition of the ineffectiveness of the single-medium approach to pollution control has been long in coming. Waste disposal must be

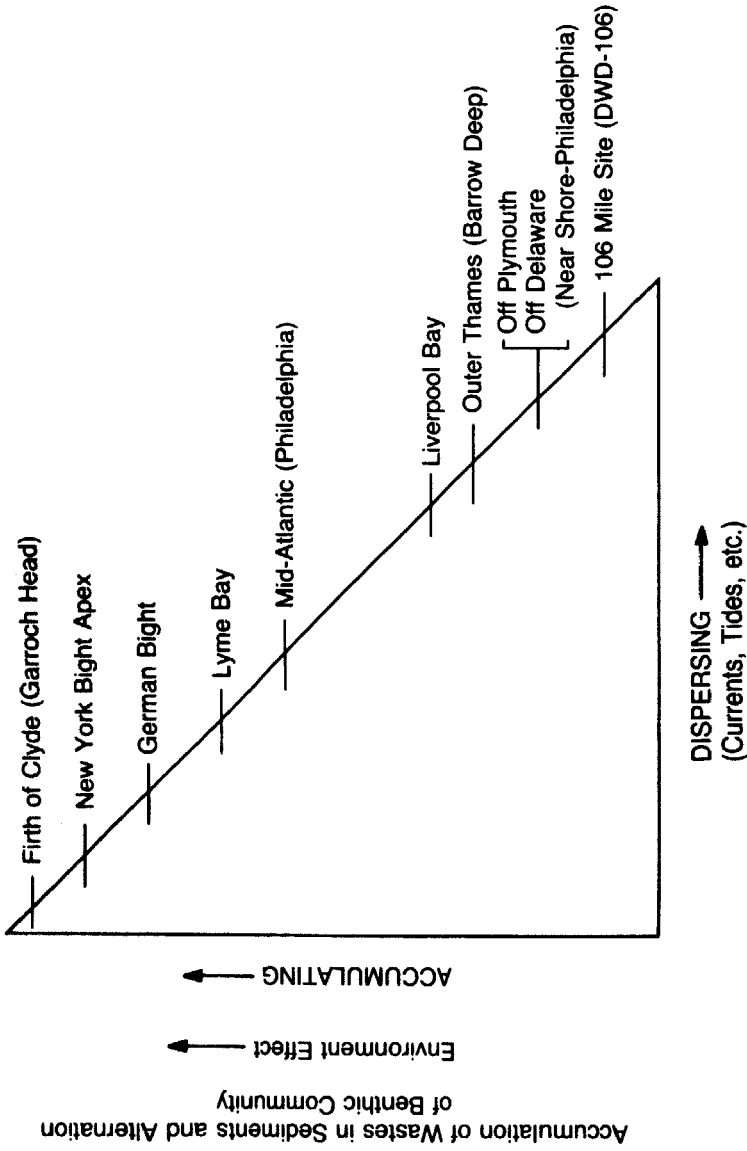


Figure 4. Comparison of sewage sludge dumpsites by accumulating or dispersing factors (modified from Champ and Park, 1981).

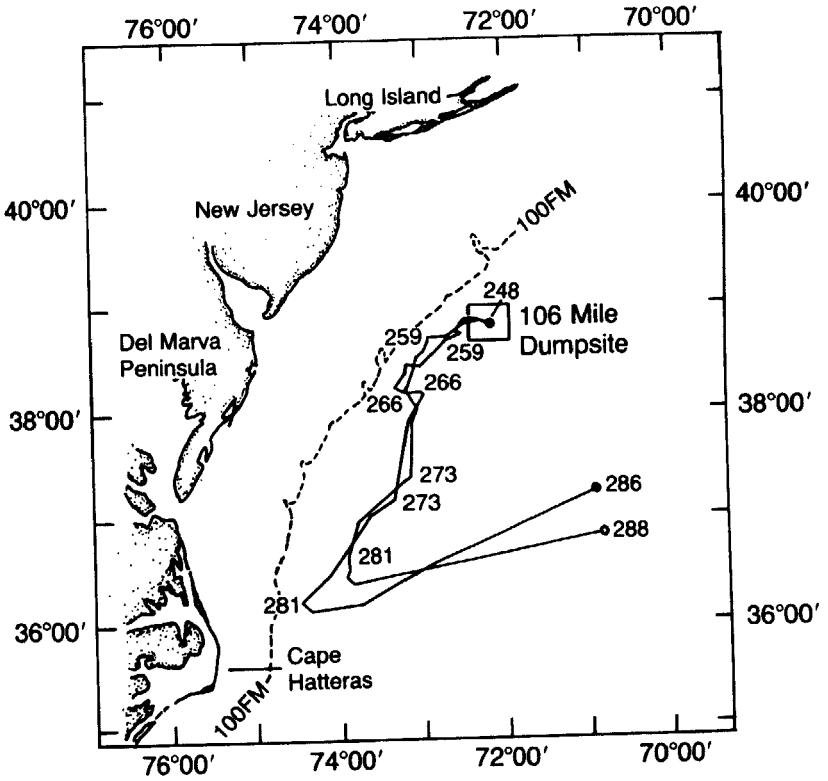


Figure 5. The deployment positions and trajectories of satellite tracked drogue buoys 3020 (solid circle) from the September through December 1980 NOAA study. Numbers along-side the trajectories indicate Julian days (Bisagni, 1981).

Table 1. Comparisons of sludge component concentrations with ambient surface water concentrations (O'Connor et al., 1985). Sludge is diluted by a factor of 5×10^5 .

Sludge Component	A Concentration (ng/kg) after dilution	B Ambient ^a concentration (ng/kg)	A + B B
Suspended solids	7.8×10^4	(10 to 30) $\times 10^4$	1.8 to 1.3
Oxygen demand (O ₂ loss)	1.9×10^5	(43 to 70) $\times 10^5$ (O ₂)	1.04 to 1.03
Total organic carbon	1.8×10^4	100×10^4	1.02
Total nitrogen	1200	9700 (summer)	1.1
Total phosphorus	800	31000 (summer)	1.02
Iron	2200	500	5.4
Cadmium	7.4	14	1.5
Mercury	1.0	5	1.2
Copper	120	170	1.7
Lead	126	5	26
Zinc	320	10	33
Chromium	126	70	2.8
Nickel	19	200	1.1
Vanadium	1.6	1500	1.001
Arsenic	0.2	90	1.002
Selenium	0.2	40	1.005
Total PCBs	0.8	0.5	2.3
Total PAHs	0.7	---	---

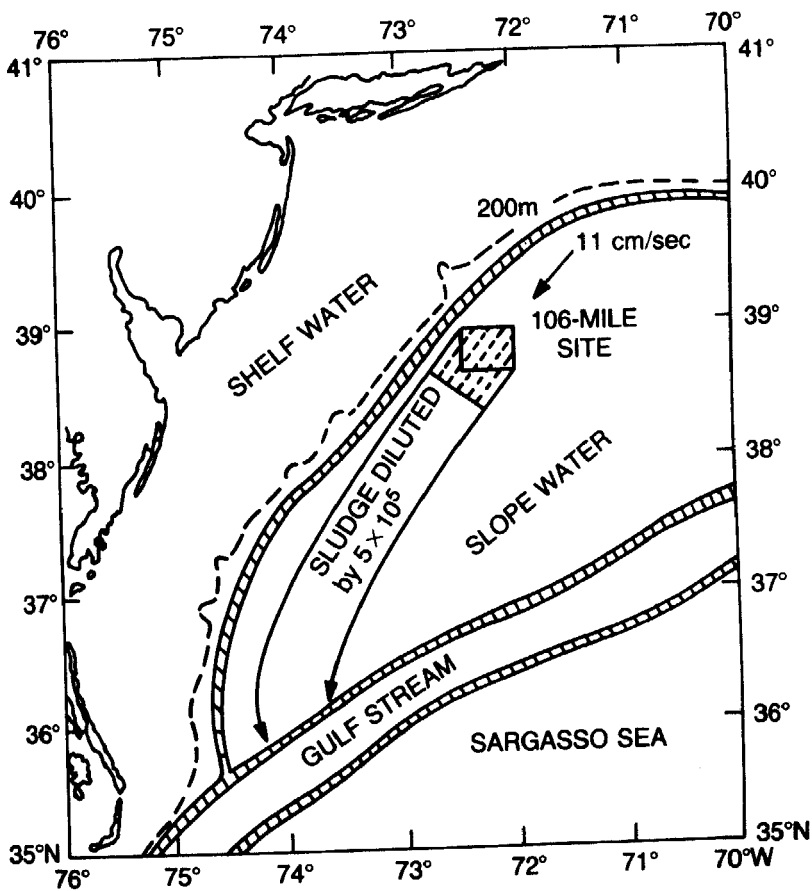


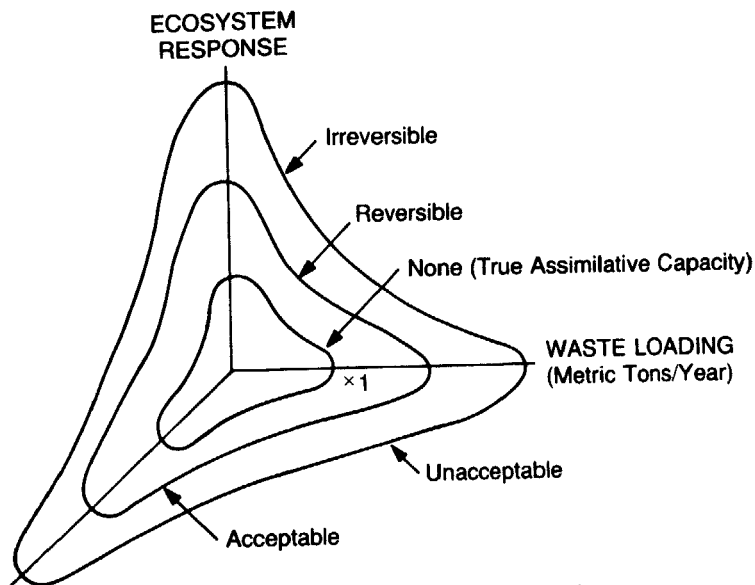
Figure 6. Predicted waste zone from ocean dumping sewage sludge at the 106-Mile Site. (O'Connor et al. 1983).

considered from a multi-media (land, air, and water) perspective. In the consideration of waste disposal from a multi-media perspective, it is assumed that even though disposal occurs into one of the media, the wastes, in one form or another, generally are transported between these media, and in many cases, actually end up in the oceans. With this perspective in mind, I would now like to discuss the concept of assimilative capacity.

There are at least four steps involved in determining assimilative capacity of a dumpsite: 1) representative biological indicators must be selected; 2) pollutants for which assimilative capacity is to be determined must be identified; 3) sources of selected pollutants (pathways, transformations, and sinks) must be identified and characterized -- and the effects of pollutants on the biological indicators must be determined; and 4) a threshold of what constitutes an "unacceptable impact" must be set (Hebard and Champ, 1981). It would be the responsibility of policy- and decision-makers (i.e. publicly elected officials) to establish the threshold between acceptable and unacceptable ecological impacts based upon the social and economic values that must be integrated with scientific information. Assimilative capacity is also a concept which has "built in elasticity" due to marine resource use or acceptability of marine organisms present. For instance, it may be acceptable to resource management for a major port facility to be less pristine (even to contain pollution-tolerant organisms) than an adjacent estuarine system. The implication here is that pollution tolerant organisms would be expected to have a higher waste assimilative capacity due to acclimation or adaptation. Therefore, assimilative capacity is a concept that requires a predetermined level of acceptability of the state of a given ecosystem by policy- and decision-makers (see Figure 7). The assimilative capacity of an ecosystem should be defined as a rate function (unit weight/unit volume/unit time/season) of the biodegradation rate of a given waste material that can be disposed in a body of water without producing an effect on organisms in that body of water. Effect should be defined with reference to reproductive potential that would lead to an alteration in distribution and abundance in organisms.

The effectiveness of any marine pollution program will be limited by a major information gap in the area of evaluation of acceptable risk and dose response of the ecosystem to pollution loading, as illustrated in Figure 7. It is anticipated that in the U.S., marine pollution programs over the next several years will focus a great deal of effort on the development of risk assessment methodology and assessment or validity of these efforts (see Figure 8).

Another major caveat that ocean disposal management strategies must not lose sight of has been excellently addressed by Kamlet (1981): that is, the problem that the ocean, as a common resource, will always suffer the "tragedy of the commons." As a commonly owned (or unowned) resource, the ocean is not protected by marketplace and political forces comparable



Risk Assessment (Integration of Social and Economic Values)

Figure 7. Risk assessment contours, illustrating integration of different social and economic values with ecosystem responses. x_1 = True Assimilative Capacity (Hebard and Champ, 1981).

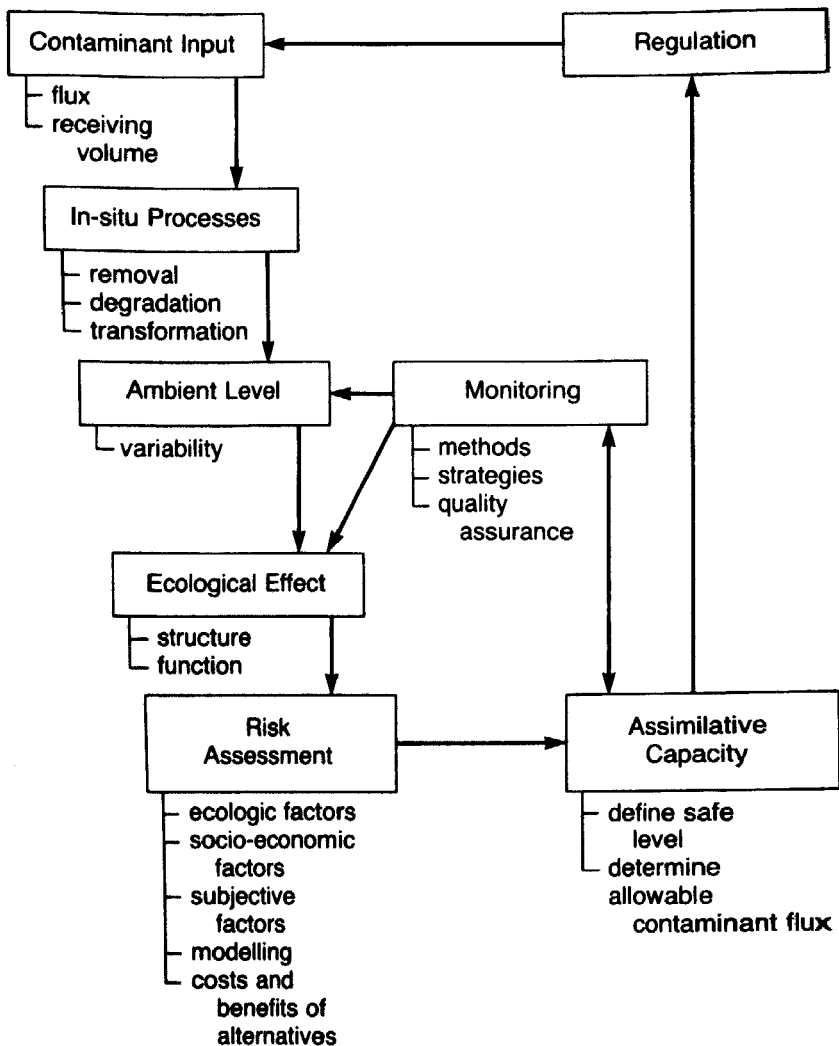


Figure 8. Conceptual diagram of the major components in future U.S. national marine pollution programs (Hebard and Champ, 1981).

to other alternatives of waste disposal. Therefore, ocean disposal could "inexorably increase until the assimilative capacity of the world ocean is ultimately exceeded".

In summary, I believe in the need to focus our attention on the development of the concept of assimilative capacity and risk assessment methodology as it relates to the disposal of wastes in the ocean, particularly as we find more problems associated with waste disposal on land (contamination of drinking water) and in the air. Both land and air disposal appear, in most cases, to have a much closer link to mankind and public health than ocean disposal. It will be necessary for the scientific community to develop specific types of information that the regional resource managers will need in the future to make decisions. Methodologies are needed which integrate and weigh complex social, economic, and environmental issues into decision-making equations.

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COMMENTARY

Thomas K. Bick
U. S. National Wildlife Federation

Thank you, Dr. Vandermeulen, for inviting the National Wildlife Federation to be represented at this symposium today. The Federation is a private environmental group, and the largest conservation organization in the United States, with about four and a half million members. It has been actively involved in ocean pollution issues now for almost a decade.

What I want to do today is take a look at the US policy towards ocean pollution; at how it might reflect some of the concerns that the three scientists have raised today; at how it might, in an ideal world, address some of those concerns; and how, in fact, it addresses those concerns, if at all. What makes this difficult is the fact that the ocean pollution policy of the United States seems to be in a state of flux. So we are, in a way, looking at a moving target.

While I am going to look at just the pollution control program of the United States, I don't want to deemphasize the importance and the need for global solutions to ocean pollution. As was pointed out by the previous speakers, ocean pollution is, of course, a global problem. Pollutants deposited in the coastal area of one country can easily move into the coastal area of another, as those living in the Mediterranean Sea area know only too well. Moreover, only a global approach can avoid the creation of pollution havens in areas of the developing world. This may already be occurring, as less developed countries yield to the temptation to impart the pollution costs as well as the economic benefits of certain industries without the safeguard of an effective pollution control program. The UNCLOS III Convention, by giving marine pollution control responsibility to individual coastal states within the EEZ, could result in a patchwork quilt of varying pollution control standards and levels of enforcement, governing thirty-seven percent of the oceans, in the absence of a comprehensive set of international agreements to standardize ocean pollution control. Despite the Convention's emphasis on the need for development of multilateral marine pollution control programs, there is no question that the bulk of both rule-making and enforcement powers to prevent injury to the oceans will remain in the discretion of individual states, probably for the indefinite future. Therefore, it is vitally important that there be strong unilateral action, especially among those nations best able to afford such action to control ocean pollution.

With that in mind, let's take a look at what the United States is doing. First of all, is there an overall US policy on ocean pollution? Those who favor strong marine pollution controls in the United States are concerned that there may be an emerging policy in the new Administration to view the oceans as a convenient, first-choice solution to the growing waste

disposal problems in the United States. Although US policy-makers are constantly emphasizing recent scientific studies which show that the oceans have a greater capacity to assimilate various wastes than was previously thought, probably the real reason for this apparent shift in US ocean pollution control policy is economic and political. As has already been mentioned, there has been an enormous increase in the creation and production of toxic wastes, and these toxic wastes have to be dumped somewhere. It is likely that there is going to be a huge increase in contaminated sewage sludge. Indeed the New York and New Jersey municipalities are already dumping about eight million tons a year of contaminated sewage sludge in the New York Bight. This is likely to increase to about ten million tons in 1990. Also, a number of coastal communities on both the east and west coast are apparently running out of alternative land-based solutions to their sludge disposal problems, and will be more than likely looking to the oceans as a solution to that problem.

There is also expected to be a huge increase in the production of contaminated dredge spoils, as there is an increasing emphasis in the United States on the dredging of ports, especially on the east coast, for the export of coal. Some have characterized these dredge programs on the east coast as the largest displacement of contaminated materials from one area of the coastal environment to another in U.S. history. There is also, as many of you know, a growing stockpile of radioactive waste material, and a solution has to be found for the disposal of that material.

Faced with the current economic realities, a lot of the waste disposers are looking for cheaper, more economical means of disposing their sludge. Moreover, there are growing concerns over the problems of land based waste management, especially the possibility of land-based disposal of waste resulting in contamination of ground water.

Accordingly, I think we are going to see greater and greater pressure on disposing of wastes in the ocean. The problem with this is that it fosters an "out-of-sight, out-of-mind" philosophy. It makes it considerably easier for politicians especially to close their eyes to the dumping of wastes in the ocean, when the alternative would be arguing for the disposal of those wastes in their own congressional districts. For this reason, I think it is important the oceans be given a preferred status in any type of comprehensive waste management strategy that the United States develops. I believe that unless there is some kind of presumption built into the law against the ocean dumping of contaminants, there is a very real risk that the oceans will become the first-choice solution to our growing waste disposal problems.

Let's take a look at whether or not we have such a preference now built in our current law. The Ocean Dumping Act, which as some of you may know, came under attack by the city of New York last year in what could be a landmark case, requires the EPA to develop regulations for determining what materials

may and may not be dumped in the ocean. The EPA developed regulations that provide a mechanism, whereby, under EPA-established environmental impact criteria, wastes failing these tests could not be dumped in the oceans. Congress grew impatient in 1977 with EPA's failure to hasten the process of ending the disposal of toxic sludges in the ocean, and passed an amendment that required the total phaseout by January 31, 1981, of all sludges that failed to meet the EPA's environmental impact criteria.

Well, New York City and New Jersey, which were dumping a total of about seven to eight million tons of highly contaminated sludges in the New York Bight -- sludges that failed to meet EPA's environmental impact criteria -- went to court against the EPA. In that case the judge agreed with New York City and held that EPA could only prohibit the ocean dumping of sewage sludge, after balancing the potential impacts of that sludge on the ocean with the potential impacts of disposing of that sludge on land. The judge also said that the EPA had to take economic factors into account in its comparison of these alternatives. The court ordered EPA to go back and revise its regulations as to reflect an appropriate balance. The likely result of this will be, I believe, the end of the preferred status of the oceans. This might very well lead to a return to the oceans by a number of different municipalities looking for a cheap way to dispose of their sludges. In fact, in the wake of that New York City case, up to twenty different municipalities on both the east and west coasts are now considering going back to the oceans with their sewage sludge, as well as a number that have never used the oceans before to dispose of their sludge.

What is the Reagan Administration's response to the EPA case? In a move that was surprising to many of us, it decided not to appeal the decision. Instead, it adopted the holding in that case that there had to be a balancing mechanism in the law. It also settled the New Jersey problems separately in a manner that reflected that same principle.

I think there is another need in the United States ocean dumping program that is not being met by the current Administration; namely, the strict enforcement by the United States of the ocean dumping provisions in the London Dumping Convention. The Convention is, I think, an excellent example of the first step toward the type of multilateral approach to ocean pollution that many of us feel is needed. The Environmental Protection Agency should be taking a lead role in rigidly enforcing the provisions of the Convention, but what is the current policy? The Convention prohibits the dumping of materials that contain blacklisted constituents, listed in Annex I of the Convention. These include mercury, cadmium, organohalogenes such as PCB's, and a number of specified oily waste materials. It has a flat ban against the dumping of such contaminants in other than trace amounts, but left it to each country to define what was meant by trace amounts. The EPA issued regulations that defined trace amounts, but sludges

dumped by both New York and the New Jersey municipalities failed to meet that definition. Unfortunately, the EPA did not raise the London Dumping Convention issue in the New York City lawsuits, even though it was urged to do so by a number of members of Congress. Accordingly, the National Wildlife Federation has decided to go to court against the EPA to try to raise the London Dumping Convention with respect to the sewage sludges being dumped by the New Jersey municipalities.

There is another need in the United States Ocean Dumping Program that is not being met, and that is the need for a very strong pretreatment program. By pretreatment, we mean the removal of the contaminants at the source, the removal by industry of various toxic contaminants before those contaminants are dumped in the sewers and go to the public treatment works. It must be emphasized that pretreatment could be a major solution to both the sludge contamination problem and the dredge waste material contamination problem. Where treatment systems are capable of removing the highly toxic wastes from waste water, these toxics wind up in the sewage sludge residues. If the treatment works are not capable of removing those toxics, the toxics remain in the effluent that goes into the rivers and the coastal waters, where they contaminate sediments that may have to be dredged out later. Then these toxic materials end up in the dredge spoils.

A wise ocean dumping policy would favor a very strong pretreatment program, but this proposal has bogged down at EPA. Comprehensive regulations, required under the Clean Water Act, have not been passed, and the Administration is now proposing amendments that would significantly weaken the pretreatment requirements in that Act.

Another US statute, the Resource Conservation and Recovery Act (RCRA), deals with the hazardous waste disposal problem in the United States, primarily the disposal of hazardous waste in landfills. Without a strong pretreatment program in the United States, the RCRA will actually encourage an increasing amount of contamination of sewage sludge. When an industry wants to dump a toxic waste in a landfill, it has to go through a number of rigid controls that are built into the RCRA, but if it wants to avoid those, it can simply dump it down its sewer system into the municipal treatment works, and none of those controls apply. So I think the net effect, without a strong pretreatment program, will be the actual encouragement of more toxic waste going into pretreatment systems, and winding up either in sewage sludges or in dredge spoils.

Another need is for criteria for testing materials that dumpers propose to dump that take into account some of the considerations that are of concern to the scientists. These include the potential long-term effects on marine life and on human health of dumping these contaminants in the ocean; the synergistic effects of contaminants; the sub-lethal effects of these contaminants; and the effects of these contaminants on the total marine ecosystem. As EPA readily acknowledges, the current criteria for testing these materials, to determine if

they may or may not be dumped, fail to take these scientific factors into account. They are primarily based on the traditional bioassay test that Dr. Vandermeulen referred to earlier. It is a ten-day bioassay test, and it is based totally on mortality. It does not take into account sub-lethal effects.

It is interesting to note what happened when the National Wildlife Federation sued the Army Corps of Engineers a couple of years ago. The Army Corps of Engineers -- for those who don't know -- is the agency in the United States which has jurisdiction over the disposal of dredge spoils. The Federation sued the Corps to require that it take into account sub-lethal effects, when they test materials for their suitability to be ocean dumped, and also to ensure it take into account the bioaccumulation potential of organisms. Well, the Corps agreed to take into account bioaccumulation, and developed bioaccumulation criteria, and, lo and behold, a major dredging project in New York was stopped, because the dredged material failed to meet the bioaccumulation criteria. After a flurry of activity, the EPA and the Corps got together and decided to relax their criteria just enough to allow the dredging of New York harbor to continue.

I will conclude with one more comment on national policy. A National Ocean Pollution Policy should include, especially with the present emphasis on returning to the ocean, a very strong research and monitoring program. Unfortunately, the Reagan Administration has submitted a budget that would seriously cut back on the National Oceanic and Atmospheric Administration's research budget. It would cut that budget almost in half, and I think the latest submission would cut back NOAA's ocean dumping research almost to zero.

I'll conclude with this question: If the United States cannot afford a strong marine pollution control policy, can it really expect other nations to do so?

COMMENTARY

Terence C. Bacon
Canadian Department of External Affairs

1982 marks the tenth anniversary of the Stockholm Conference on Human Environment. Ten years ago the realization that some environmental problems had reached such proportions that only world-wide cooperation could bring them under control and an optimism that solutions could be found resulted in the adoption of the Stockholm Declaration and the Action Plan for the Human Environment. Canada regards the Stockholm Declaration as nothing short of a fundamental code of environmental conduct and a major starting point for the development of environmental law. Some of the principles in the Declaration, in particular Principle 21 on the environmental rights and duties of states, reflect what we regard to be existing customary law. The Action Plan was, and is, an ambitious but practicable guide for the protection of the global environment.

But there is little to celebrate on this particular anniversary. In spite of having shown the way at Stockholm really very little has been achieved in the development of international environmental law over the past ten years. As is so often the case where there is heavy involvement of national and international bureaucracies, action on substance has given way to concentration on process.

There are many examples where governments have been willing to go through the motions of developing legal principles but have, in the end, declined to adopt them. At the regional level, the OECD Transfrontier Pollution Group in 1974 produced a number of "Principles Concerning Transfrontier Pollution". The OECD Council declined to pass the Principles as a "decision," which would have been binding on member states, and passed them as a non-binding recommendation only. At the global level, a UNEP working group took almost three years to produce "Principles on Natural Resources Shared by Two or More States". In 1979 the United Nations General Assembly could do no more than "take note" of these principles. A similar result was produced by another UNEP working group on environmental aspects of offshore mining and drilling. In that case the group itself could not agree whether the result of their labours should be called "principles" or "guidelines", and so referred to them as "conclusions". In any event, the UNEP Governing Council only "took note" of them.

In other areas the record is not much better. Progress for the protection of the marine environment in IMCO (now called the International Maritime Organization) is slow. Although the International Convention for the Prevention of Pollution from Ships was concluded in 1973, it is not expected to come into force until 1983, fully ten years later. The Law of the Sea Conference, after twelve years of negotiations, failed to achieve a consensus and in the end had to resort to a vote,

although the provisions for the "Protection and Preservation of the Marine Environment" in Part XII were not at issue.

Bilaterally for Canada the picture is even gloomier. The transfrontier problems we now have existed ten years ago, or even twenty years ago, and still they are basically unsolved. Funding essential to meeting obligations under the 1978 Great Lakes Water Quality Agreement is being drastically reduced by the U.S. Government. After three rounds of negotiations with the U. S. Government on transboundary air pollution we seem further than ever from any meaningful commitment to reduce the pollutant emissions that cause acid rain. The U.S. authorities argue that the data base is not good enough to justify spending four billion dollars on emission reduction programmes. If we adopt this attitude, there will never be quite enough data to take action on any environmental problem. Indeed, if we had taken this view in 1972, there would be no Ocean Dumping Convention and no Canada-USA Great Lakes Water Quality Agreement.

It is clear that the development of environmental law has had some formidable obstacles placed in its path over the past decade. The rapid increase in energy prices from 1973 onward and the widespread fear of energy shortages tended to subordinate environmental concerns to the necessity to diversify and develop new energy sources. Now, of course, the major problem is economic. The widespread recession is bound to have a retarding effect on environmental development.

I stress the shortcomings of the last ten years only to emphasize the necessity for increased efforts over the next ten. We still have the Stockholm Declaration and Action Plan, which are as valid today as they were ten years ago. In the field of international environmental law, the UNEP Ad Hoc Meeting of Senior Government Officials held in Montevideo last November produced an action plan for the development of environment law by governments and international organizations over the rest of this decade. In addition, a great deal of work will be required to implement Part XII of the Law of the Sea Convention.

This brings me back to pollution in the economic zone. Here as much as any area of environmental protection we must avoid going around in circles on matters of procedure or process without achieving anything of substance. The most serious sources of this pollution are land-based, transmitted to the oceans through rivers, through dumping, and through the atmosphere. The Stockholm Action Plan, the Law of the Sea Convention and the UNEP Ad Hoc Meeting have all identified marine pollution from land-based sources as a subject area requiring international action. Some regional instruments have already been developed, notably the 1974 Paris Convention for the Prevention of Pollution from Land-based Sources, which applies to areas of the Atlantic and Arctic Oceans, and the 1980 Athens Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-based Sources. UNEP, whose overall effectiveness may be subject to some question, has done excellent work in this area through its Regional Seas Programme.

We may now be coming full circle through the three "E's" of "environment", "energy" and "economics". The early 70's marked the birth of real environmental awareness. That was followed by a much more restrained period of energy and then economic concerns. Hopefully, the 1980's will see a resurgence of environmental concern which will be focused on substance and the implementation of concrete measures, not on a preoccupation with process and good intentions without commitment.

COMMENTARY

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INTRODUCTION

I would like to take as a starting point John Vandermeulen's call for a new partnership between scientists and lawyers or policy makers. The question is, in the light of the scientific evidence we have had presented today, what should be done?

A common theme in the three scientific presentations was that the problem of non-vessel source pollution in the exclusive economic zone is an international problem, and therefore we need international action. What are the prospects for international action in the post-LOS period? What is the chance of effective international action through international organizations?

My suggestion is that we do not get our hopes too high. First, we have a tendency to expect too much of international organizations. It is a trite and self-evident proposition, but nevertheless true, that international organizations, at least multilateral organizations of the United Nations system and particularly those concerned with the oceans, possess no autonomous legislative authority. They can sponsor international conferences that may lead to the drawing up of treaties, but they cannot adopt standards that will be binding on states. So it is up to states themselves to initiate any international legislative activity.

Second, in this area there is a lack of clear organizational or institutional competence to deal with the problems of non-vessel source pollution. In part this results from the fact that we are dealing with a relatively new use (or abuse) of the oceans. While vessel source pollution has been a matter of concern at least since the first international convention on the matter in 1954, non-vessel source pollution (land-based, atmospheric, dumping, and pollution from sea-bed activities) has had a much lower prominence. The result is that in spite of the provisions in the Law of the Sea Convention placing an obligation upon states to legislate to prevent non-vessel source pollution in all of its manifestations, and giving states the authority to enforce that legislation in the exclusive economic zone, there is no clear agreement on the fora in which international regulations ("global and regional rules, standards and recommended practices and procedures") are to be developed.

The matter is not without importance, for it must not be forgotten that the international rules, standards, practices and procedures are to provide the minimum standards for states enacting legislation dealing with dumping and pollution from sea-bed activities (Law of the Sea Convention, Articles 210(6)

and 208(3)). The same possibly applies in the case of land-based pollution and pollution from atmospheric sources, although the Convention is not entirely clear on this point (*ibid*, Articles 213 and 222). Thus, states must be able to know which international organizations are the "competent international organizations" able to establish the "global and regional rules, standards and recommended practices and procedures."

ACTION AT THE INTERNATIONAL LEVEL

What organizations can we turn to for the development of international legislation in the area of non-vessel source pollution? I limit myself here to the major institutions of the United Nations system. On the face of it, the identification of the appropriate organizations should not cause difficulty, but when we look more deeply problems arise.

The International Maritime Organization (IMO) is the depository for the London Convention on Ocean Dumping (1972), the only general multilateral convention on dumping. IMO convenes annual meetings of the Contracting Parties to the London Dumping Convention, and Annex VIII of the Law of the Sea Convention on Special Arbitration Procedure identifies IMO as the organization responsible for maintaining "lists of experts" in the field of dumping. But concerns have been raised about the appropriateness of assigning responsibilities to IMO for the development of international rules and regulations for ocean dumping. The principal responsibility of IMO is to facilitate shipping, and there is a fear that environmental concerns will be subordinated in that organization. Thus there may be a move in the future to remove the depository functions for the London Dumping Convention to some alternative organization. The Contracting Parties to the London Convention have recently, in collaboration with the parties from regional dumping conventions, established a Task Team to look at ocean dumping needs to the year 2000 [1]. IMO's role in the field of ocean dumping may well be raised before the Task Team.

In the area of land-based source pollution and pollution from sea-bed activities the United Nations Environment Programme (UNEP) has been active through its Regional Seas Programme and the work of its Group of Experts on Environmental Law. This has resulted in the Athens Protocol on Land-Based Source Pollution to the Barcelona Convention [2] and recommended guidelines on the protection of the marine environment from off-shore drilling and mining [3]. But UNEP does not have an explicit constitutional mandate to develop international rules and regulations. There are states who argue that UNEP was not intended to have an operational role; its functions are "catalytic and co-ordinating". Thus, at the recent meeting of the Governing Council of UNEP a Canadian proposal that UNEP should take on the role of depository for treaties on environmental law was rejected. The argument can be put in legal terms that UNEP is not an autonomous international organization; it is only a "programme", a subsidiary organ of

the United Nations. The Vienna Convention on the Law of Treaties (Article 76) provides that states or international organizations can be depositories for international treaties. It makes no provision for subsidiary organs of international organizations. Is, then, UNEP a "competent international organization" within the meaning of the Law of the Sea Convention?

The organization with which marine scientists are most familiar is the Intergovernmental Oceanographic Commission (IOC). It has been responsible for co-operative scientific investigations and the global study of marine pollution. But IOC has long been uncertain over its real role and functions, it has had an uneasy relationship with its parent body UNESCO, and in recent years has had continued problems with overlapping activities with UNEP, particularly in the field of the monitoring of marine pollution. A recent co-operation agreement between UNEP and IOC [4] has attempted to ameliorate this problem, but the underlying difficulties remain unsolved. The question of legal capacity referred to in respect of UNEP might also be raised in the case of IOC, which is a subsidiary organ of UNESCO. IOC might well be the organization that can undertake the global study of marine pollution that John Vandermeulen has suggested is necessary, but it is not clear which organization should be responsible for the development of the international regulatory system that Dr. Vandermeulen also says is required.

The problems of identifying the "competent international organization" for the various aspects of non-vessel source pollution are compounded when one recalls that within governments different departments are responsible for the activities of different organizations. In Canada the department with the principal interest in IMO is the Ministry of Transport; the Ministry of the Environment is primarily interested in UNEP; the Ministry of Fisheries and Oceans is the department with the principal interest in IOC; and the Ministry of External Affairs retains responsibility for all of these organizations. The problem of co-ordination within governments only compounds the problem of co-ordination internationally, and if there are difficulties in Canada one can imagine the bureaucratic difficulties in the United States.

It is clear, then, that an important agenda item in the post-UNCLOS III period, if we want to deal with non-vessel source pollution at the international level, is the clarification of roles of the organization in the field, and the formulation of some agreement on who is responsible for what. These agreements must occur not only at the inter-secretariat level, but also at the inter-governmental level. The issue has been avoided during the UNCLOS III negotiations, but it must be resolved as early as possible, if effective international legislation is to be developed.

ACTION AT THE REGIONAL LEVEL

As an alternative to action at the international level, should action at the regional level be promoted? If one looks at the volume of treaties and agreements being concluded relating to non-vessel source pollution, then the regional level appears promising. There are some questions, nevertheless, that should be raised. First, will regional agreements and standards be an effective answer to the problem? The thrust of the presentations by Drs. Farrington, Vandermeulen and Champ is that the problem is international in scope, and thus regional agreement may be only a partial answer to the problem.

Second, if one considers regional action, the immediate problem is that of defining the region. The concept of a "region" has been used indiscriminately in the UNCLOS III Convention and it needs some clarification. In the Northwest Atlantic area one might define the region in terms of all the states fishing in the area. This would include, in respect of the Canadian EEZ, all NAFO states. However, even if a region was adequately defined for the Northwest Atlantic, it is unlikely that it would be a region that would attract substantial UNEP interest and funding as part of the Regional Seas Programme. Ultimately a "regional" approach in the Northwest Atlantic might well be a bilateral Canada-United States approach to non-vessel source pollution in their EEZ's.

Assuming a bilateral approach, are there precedents for such actions? The precedents appear both positive and negative. On the positive side the International Joint Commission is often regarded as a major achievement of Canada-U.S. co-operation in the environmental field, and the more recent Great Lakes Water Quality Agreement (1972, revised in 1978) is also an example of what can be done at the institutional and regulatory levels. On the negative side, the abortive East Coast Fisheries Agreement and the currently stalled negotiations on acid rain make the prospects for effective bilateral action in the near future more problematic.

One can conclude perhaps that regional (or bilateral) action must be kept in mind as a possibility and, depending upon the nature of the pollution and its source, may be a necessary approach to the regulation of non-vessel source pollution. The prospects, however, for the present development of regional rules and standards do not appear to be good.

METHOD OF REGULATION

Once it has been decided that we wish to promote the development of international standards at the international, regional or bilateral level, what form should those standards take? Existing international agreements disclose a number of different approaches or models for the development of such standards.

- (a) An umbrella or framework commitment to reduce and prevent pollution from non-vessel sources, with the objective of working towards more detailed arrangements subsequently. This is the approach of the UNEP regional seas "action plan", with the Mediterranean programme providing the most advanced model.
- (b) The formulation of relatively specific guidelines for states to follow in drawing up their own national legislation. This was the approach followed by the UNEP Group of Experts on Environmental Law in their report on the protection of the marine environment from off-shore drilling and mining. Such guidelines were adopted by the Governing Council of UNEP, but not put into treaty form. The question remains, nevertheless, whether the guidelines constitute "recommended practices and procedures" which provide the "minimum standard" for states to meet in enacting their own legislation in accordance with Article 208(3) of the Law of the Sea Convention.
- (c) The setting of environmental quality objectives for the EEZ, both generally and specific, with provision for institutional arrangements to monitor the attainment of these objectives and recommend changes to them. This is the approach of the Canada-U.S. Great Lakes Water Quality Agreement.
- (d) The establishment by agreement of prohibitions against the release of certain specified substances into the EEZ, and the limiting of the entry of other specified substances. This is the "black list/grey list" approach of the London Dumping Convention and of other regional dumping conventions. Substances on the black list may not be dumped and those on the grey list can be dumped only under permitted conditions. States agree to establish appropriate bodies to monitor this dumping.

It is clear that there is no single approach that can be used for all types of non-vessel source pollution. The "black list/grey list" approach has the advantage of certainty, but as Dr. Farrington has pointed out, scientists may not be certain of the effects of specific elements and compounds. Yet this certainty is an essential foundation of the "black list/grey list" approach. The Contracting Parties to the London Dumping Convention try to deal with this uncertainty by regular meetings at which the substances on both lists can be reviewed and varied where necessary.

One might query, too, whether the "black list/grey list" approach is as suitable in the area of land-based or atmospheric pollution as it is in the case of dumping. Admittedly, regional conventions on land-based source pollution have adopted this approach, but is it realistic to place a blanket prohibition on the discharge of a chemical into a river 200 miles from the sea because 100 miles out to sea there is a "synergistic effect" with other chemicals, causing pollution? Will it be economically viable to do so if there is to be a substantial

effect upon industry? Obviously it was felt that in the case of the Great Lakes there could not be an immediate prohibition of established discharge practices, hence the setting of water quality objectives was chosen, an approach that might well have relevance for the EEZ.

It can be seen then that there are a variety of approaches being taken under existing international, regional and bilateral agreements. In devising approaches for the EEZ we must be flexible and not necessarily choose a single approach (e.g. black list/grey list) which may have superficial attractions but may not be adequately based scientifically, and may not result in the reduction or elimination of pollution that was hoped for.

SECURING COMPLIANCE

The third area on which I wish to comment is that of compliance with standards for marine pollution reduction or elimination. Behind the discussion of regulating or controlling marine pollution is an assumption that once the harmful agents have been identified they can be prohibited. That is, it is assumed that we can prevent discharges into the atmosphere, into rivers, and elsewhere that cause pollution. Prohibition of this kind generally means that the conduct concerned is to be made illegal, or legal only under defined circumstances, and penalties are to be imposed for non-compliance. Such non-compliance is made a criminal act. But is this effective? Does the criminal process really work in this area?

As environmental lawyers in Canada assess their efforts over the last ten to fifteen years, the conclusion seems to be emerging that criminal prosecution is curiously ineffective as a means of environmental regulation [5]. The Canadian Ocean Dumping Control Act [6] may illustrate this. The Act, based on the London Dumping Convention, sets up a black list and a grey list, provides for the issue of dumping permits, and creates an agency to review the issuance and refusal of permits. The Act came into force in 1975 and by the end of 1980 a total of 923 permits had been issued for dumping in all Canadian waters, including internal waters [7]. However, only two charges have been laid under the Act, and on the second charge a provincial court in British Columbia declared the Act unconstitutional [8]. This decision is under appeal.

Does this mean that there is no non-permitted dumping in Canada? Does it mean that prosecuting authorities in Canada are not vigilant in dealing with ocean dumping offences? Probably neither is correct. What the statistics indicate is that it is often extraordinarily difficult to meet the standards required of the criminal process, which presupposes certainty in the definition of an offence, an adequate detection system, and a high degree of certainty in the standard of proof. On the other hand, those who administer the Ocean Dumping Control Act see the effective regulation of dumping in Canada being carried out in the bargaining that goes on and the control that is exercised through the issuing of permits, not in the invocation of the criminal process against malefactors.

This suggests, then, that the criminal process may be inappropriate for dealing with some kinds of harmful environmental activity. There is, in fact, a general concern about the application of the criminal justice system to regulatory activity which creates new statutory wrongs. The criminal justice system, because it has traditionally been concerned with the liberty of the individual, has imposed a high burden of proof which cannot always be met in the environmental area. If one can return to the example of a chemical discharged into a river 200 miles from the source, which might cause harm through a synergistic effect in the ocean 300 miles away, one can see clearly the difficulties of resorting to the criminal law process.

If we move away from the required certainty of the criminal law in attempting to regulate activities that cause environmental harm in the EEZ, we may be able to respond to the concerns of John Farrington, who has suggested that less than certainty is what scientists can provide in this area, and that predictions based on the existing state of scientific knowledge can be more reasonably expected. The need for scientific certainty, a concomitant of relying on the criminal process, has forced environmental regulation into the positing of absolute standards. A move away from such rigidity should be investigated in establishing standards for the EEZ. We must look at alternatives such as bargaining between regulators and potential polluters, civil remedies [9], and differential standards for different types of activity or potentially polluting behaviour.

Finally, where do we go from here? Obviously we need more research on the present state of the oceans. As Dr. Vandermeulen has suggested, we need a global study of marine pollution in the EEZ. In conjunction with this research, attention must be given to the types of standards that are needed and the controls that are necessary to implement those standards. In doing this we must be innovative and be prepared to experiment. We have not reached a marine pollution crisis in the EEZ as yet, and we have time to ensure that we find the best possible approaches. At the same time we must ensure that the appropriate forum has been identified for the development of international rules and standards, and for the stimulation of appropriate regional action.

NOTES

1. See Draft Report of the 6th Consultative Meeting of the London Dumping Convention, LDC/VI/WP 6, at 19.
2. 19 International Legal Materials 869 (1980).
3. UNEP/GC.9/5/Add 5, Annex III.
4. IOC/EC-XV/8, Annex 6.
5. Andrew R. Thompson, Environmental Regulation in Canada: An Assessment of the Regulatory Process 46-51 (1980).

6. S.C. 1974-75 c. 55.
7. Based on information provided by Environment Canada.
8. B. v. Crown Zellerbach, unreported decision of May 26, 1982. The decision was based on the earlier opinion of the British Columbia Court of Appeal that held Georgia Strait (including the area in which the dumping took place) to be the property of the Queen in Right of the Province of British Columbia; see Reference re: Ownership of the Bed of the Strait of Georgia and Related Areas (1977) 1 B.C.L.R. 97.
9. These suggestions can be found in a paper given by Dr. Andrew Thompson to a Colloquium on "The Social Responses to Technological Change and Environmental Impact", held at the University of Calgary in March, 1982, entitled "Bargaining with the Environment: The Limits of Regulation".

DISCUSSION AND QUESTIONS

HUGH HALL: I am responsible for administering the Canadian Ocean Dumping Control Act in this region. We were dismayed, of course, at the court decision that the Act is unconstitutional. We have a very complicated constitutional system in this country, and it is understandable that this could have happened. But this decision in no way reflects on the purposes of the Act, or the uses to which we have put it in the last seven years. The approach suggested by Professor McRae is exactly the approach we are using in the Atlantic region. It is true that we have not had a single persecution under the Act in this region, but we feel confident that we are controlling discharges into the marine environment -- to the extent one can effect "control" -- by means of what I would call "pragmatic compromise."

GEORGE NEEDLER: As a scientist who has dealt with a couple of international dumping problems in the open seas, I am interested in involving the views of the international science community in these matters. In my experience bureaucracies like UNEP and IOC do not normally overrule scientific opinions, if they are strong enough and bear upon a real problem. I have seen regulations bend occasionally under the weight of scientific opinion. Scientists who can get together under international auspices such as SCORE or GESAMP can really throw their weight around quite a bit. In the last six or seven years the international scientific community has become more involved than ever before in marine pollution issues, and in new ways. Admittedly scientists still have trouble in answering lots of questions, but I think the trend toward the cultivation of international scientific opinion must be encouraged.

JOHN FARRINGTON: I think most of us would agree with Dr. Needler's comment. In the U.S. the oceanographic research community was so successful in arguing the point that we ended up with a ban on ocean dumping. Meanwhile, our colleagues outside the marine sciences were not really paying much attention to the waste disposal problem, because they were involved in other matters. But now we are all concerned together with the larger question of choosing among the alternative media of disposal. The basic question is this: how certain do we have to be? In some contexts, such as radioactivity, the public is so alarmed that we are not required to present a preponderance of evidence before scientific opinion has an impact.

JON VAN DYKE: I have a question for Mr. Bacon in his capacity as one of the negotiators at the London Dumping Conference. The environmentalists sometimes criticize the London Dumping Convention for being much too lax, inasmuch as it seems to authorize the dumping of low-level nuclear waste in the

ocean. I wonder if Mr. Bacon can recall the attitude of the negotiators toward the matter of low-level wastes. Did they have a clear idea at the time of the difference between low-level and high-level wastes, because that is still an unsolved problem?

TERENCE BACON: Because of the difficulties we were running into on this issue at London, it was found necessary to fall back on the standards that the International Atomic Energy Agency (IAEA) had already developed on the disposal of low-level radioactive wastes. There was a great deal of controversy on a number of issues at the Conference, and there was simply no opportunity to get consensus on stringent language for radioactive wastes.

JOHN VANDERMEULEN: In a few minutes we'll have to close this session. Dr. Neil Campbell has kindly agreed to provide a summing-up and some personal observations. Dr. Campbell, who is currently Director-General for Marine Sciences with Fisheries and Oceans Canada and also First Vice-President of the International Oceanographic Commission, served previously as senior scientific advisor to the Canadian delegation both at the Stockholm Conference on the Human Environment and at the London Dumping Conference.

NEIL CAMPBELL: I thought there were a number of rather landmarkish things that came out of this afternoon's session, pointing the way to new themes and policies that must emerge. Two of our speakers referred to the fact that the oceans were likely to become a prime choice for the dumping of wastes, and John Farrington indicated that there was evidence that waste disposal will soon be shown to have adverse effects on the land and atmosphere as well as the ocean environment. Above all, I was interested in the discussion of the problem of scientific uncertainty. The conclusion I would support is this: "incomplete experimental evidence, or the results from monitoring, sometimes make it prudent to control some form of pollution before there is complete proof of damage." This belief was more or less subscribed to throughout the 1970's, a period when we scientists worked closely with lawyers. As scientists, we were not really able to provide the full evidence that was needed to write the laws or prepare the regulations in a form that could withstand challenge. It is sobering, ten years after the Stockholm and London Conferences, to see our legislation, which is derived from these Conferences, being criticized as based on inadequate information. Looking back, we should see those treaties, statutes and regulations as the imperfect product of a rather tentative partnership between scientists and lawyers. Now, it is clear, we are faced with choices: political and economic choices. What are the benefits and disbenefits of dumping or not dumping in the ocean? Somehow the scientist and the lawyer have got out of step. Getting back into step with one another may be more difficult than it was a

decade ago, because today we are facing a more complex society, a more complicated set of social issues.

One thing that was not well understood at Stockholm or London was the importance of the processes that take place in the ocean. We have had several examples of what happens when one dumps in a local area, but it is far from clear how natural factors interact in the ocean at large through large-scale processes.

I think the lawyers in turn must begin to appreciate that it may not be possible for the scientists to provide a preponderance of evidence in some of these matters. In turn, we may have to re-frame the legislation in which we took so much pride six or seven years ago, making it less regulatory or less penal, as Don McRae suggests.

Finally, I would like to comment on the work done by various international scientific bodies, such as SCORE and GESAMP. I agree with Dr. Needler that this has been one of the major advances in the last decade or so. These bodies provide continuity and consistency, more than is sometimes possible at the national level. The London Dumping Conference, for example, was preceded by the Oslo Convention on the international circuit. Yet there is also a price to be paid for continuity. When the London Conference was convened, we "inherited," as it were, a set of Oslo regulations and ideas, which proved impossible to change, once they were in place.

JOHN VANDERMEULEN: Ladies and gentlemen, this marks the end of the afternoon's discussions. I want to thank the organizers, Professor Johnston and Dr. Fye, for inviting the Bedford Institute of Oceanography and the Woods Hole Oceanographic Institution to co-sponsor this special symposium with the Law of the Sea Institute. I also wish to thank the panelists for their contributions, and yourselves -- especially the lawyers -- for the patience you have displayed in dealing with unfamiliar parlance. There is a problem in communication between our two spheres, but that is something we have come to grips with this afternoon. What scientists can give is not always what the lawyers want or understand. But if we continue to talk to one another, as we have done today, there is much to be gained on both sides of the divide.

PART VII

FISHERIES:
CURRENT ISSUES AND DEVELOPMENTS
IN THE NORTH ATLANTIC

INTRODUCTORY REMARKS

Panel Chairman Giulio Pontecorvo
Graduate School of Business
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Fishery matters transcend law of the sea conferences, which in a sense are transitory, even when they last for ten years. I was once told, as a graduate student, that if you wanted to succeed in economics, you had to find a problem for which there was no possible solution, and then fiddle with it for an interminable amount of time until you somehow or other had become accepted as an "expert". Fishery science is also of that nature. These fishery matters, which plague us interminably, but also employ us, seem to defy solution -- and there is no lack of fishery experts!

Hopefully this morning's panel of experts will shed some light on a wide range of fishery management problems. We have three speakers. The first speaker is Arthur Hanson of Dalhousie University. After graduating with a PhD in fishery ecology from the University of Michigan, he has worked extensively in Southeast Asia, primarily Indonesia; and currently he is Director of Dalhousie Institute for Resources and Environmental Studies here in Halifax. He will talk to us about the Gulf of Maine and Bay of Fundy fisheries, and other Canadian fishery problems on the east coast of Canada. The second speaker will be Burdick Brittin, who has had a long and distinguished career in fishery and related matters in government. Recently he retired from his position as Coordinator of Ocean Affairs in the U.S. Department of State. For many years before that he served as a naval officer. He is author of a well-known textbook, which has been translated into several languages. In the last year or two he has been very actively involved in a private group concerned about the present U.S. Administration's postures and policies in the law of the sea. The third speaker, Brian Rothschild, has had a distinguished career first as a university professor and then as a senior official of the U.S. government in Washington, La Jolla, and other places. Recently he has come to his senses and returned to the university environment! He has probably had as much experience around the world as anyone I know in the field of marine biology and fishery management.

EAST COAST CANADIAN FISHERIES AND THE 200-MILE ZONE

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INTRODUCTION

This short presentation is intended to provide a broad analysis of Canada's east coast fisheries, as they have evolved since Canada declared its 200-mile exclusive fishing zone. The fisheries have been profiled in a number of recent publications. The basic hypothesis is that the 200-mile declaration has led to enhanced expectations, far beyond realistic levels, on the part of the Canadian fishing industry, the fishermen themselves, and, certainly in the earlier years, on the part of the federal and provincial governments. It was expected that marvelous things would happen to the east coast fisheries. In reality, there are reasons to believe that some of these expectations may never be fulfilled.

CATCH PATTERNS

The Canadian east coast fisheries 200-mile zone is very extensive. Most of the fishermen exploiting its stocks are located in or around Nova Scotia or on the shores of Newfoundland. One of the prime concerns is where they can fish. To what extent do they have access within the zone as a whole? Stocks are not evenly distributed and multi-species concerns predominate, with fishermen in many areas fishing several different species. Catches in the early 1970's were much higher than present-day totals. However, Canadians now take a higher share of the total catch. From the perspective of Canadian fishermen, the bottom was reached in the period just before the 200-mile zone came into effect in January, 1977. Now their catches have crept up beyond the Canadian levels of the early 1970's. Looking into the late 1980's, we can see there will be a continuing response to the rather effective conservation measures taken by the Canadian government and that certain stocks are likely to increase considerably.

This general, rather optimistic picture changes somewhat when we look at specific species. In the case of the Southwest Nova Scotia herring fishery, catches in the early 1970's were very high, and foreign fishermen participated in the fishery to a considerable extent. Foreign participation has now diminished to nothing, as far as direct catching is concerned, stock size fluctuates from year to year, but no major increases are predicted. This no-growth projection is, of course, quite upsetting to the fishermen dependent on this fishery.

In the case of lobsters, the present catches in the Maritimes are about half of the volume reached in the peak years

In the 1890's and 1900's. The decline is particularly serious for certain communities on the eastern shore of Nova Scotia, which have seen their catches drop to almost nothing. In other areas, such as Southwest Nova Scotia, the lobster catch is rather stable. This is part and parcel of the chronic inshore problem: very little prospect of expansion in the traditional fisheries.

The mainstay of the east coast fisheries is groundfish, especially cod. Prospects for these species are mixed, depending upon the area fished. Definitely there is growth potential in these fisheries, particularly in the northern waters off Newfoundland. A major category for possible expansion is the so-called under-utilized species, including squid, hake, and other hard-to-preserve or market species. The full potential is not accurately known in all cases.

In summary, Canadian fishermen will have opportunities to catch more fish. The problems are the non-uniformity in geographic spread of these additional resources and the limited capacity of the fleet to handle adequately some of the species not traditionally fished.

ORGANIZATIONAL RESPONSE

Back in 1977 a number of governmental initiatives were taken in response to what seemed to be an extremely good prospect of industrial expansion. With Canada's control of the 200-mile zone, it was believed time to show some creativity on the regulatory side. Processors, it was argued, could grow bigger. They could also become more complex in terms of the relationships between the catching, processing and marketing interests within the industry and the types of facilities to be built. In other words, it was believed to be opportune to begin integrated operations on a larger scale than in the past. The fishermen's response was reflected in the increased number of inshore vessels and perhaps in the increased range of their fishing activities.

In general, government felt this was a time for the maximum participation of fishermen in the setting of their priorities, in the selection of activities, the mix of species to be caught, and the types of regulations they would accept. It was also expected by government that the fishermen would become quite highly organized: hoped, at least, if not expected. Certainly in the last five years the Minister of Fisheries seems to have wanted the inshore fishermen to stand together in order to meet their collective needs.

PERFORMANCE

Unfortunately, the period since 1980 has witnessed a succession of disasters affecting the east coast fisheries. Perhaps the most serious disaster was an over-expansion on the part of the processors. This took place at a time when interest rates were relatively low, when market conditions were mostly

very good, and expectations regarding resource productivity were high. Accordingly, the industry took on a debt load which has become debilitating as general economic conditions have deteriorated. In fact, it was determined in 1981 that the major processors were close to bankruptcy. This caused the government of Canada to step in with the appointment of a senior civil servant, Michael Kirby, to establish a task force to look at the medium and long term goals in the fisheries and specifically to determine how to resolve the dilemma of having the four largest processors on the very verge of bankruptcy. The Kirby report is intended to provide a blueprint for the future administration of the east coast fisheries.

A second important outcome has been the difficulty experienced by the federal government itself in its experimentation with various kinds of regulations. Most regulations are directed to allocation of fish stocks. The distributional problems are exacerbated by the need to reconcile inshore and offshore interests, processors and fishermen, and to resolve disputes between fishermen from different areas. Some of the Canadian experiments have been bold and perhaps almost unprecedented compared to actions in other countries, particularly the U.S.A.

The major focus of government action has been to reconcile differences between inshore and offshore fleets, generally unsuccessfully. The problem still exists in almost all fishing areas in Atlantic Canada. The processors, who often own or control the larger offshore vessels, claim that the inshore fishermen receive too much of the available high-value resources. The processors further indicate a need for access to sufficient stocks that will permit year-round operation. They need freezer trawler vessels offshore, and they would like many fewer inshore fishermen sharing the resource base with them.

On the other hand, the inshore fishermen have held the view that the processors have far too much power, especially in the pricing of fish. Aside from stock allocation disputes, it is claimed large vessels (trawlers) interfere in the operation of the smaller vessels (e.g., longliners) and stock interaction problems also come into question. So the conflicts become rather complicated.

At another level, a great deal of area-based bickering has gone on. Between provinces such as Newfoundland and Nova Scotia, there have been sharp exchanges on the rights of fishermen to catch or land fish in waters and parts away from their home province. For instance, in the case of the northern cod caught off Newfoundland, should Nova Scotia-based boats be allowed to exploit that resource; and, if not, where should those boats go? This problem is part of the inshore problem when areas like the Gulf of Saint Lawrence are considered. The Gulf has been more or less closed off to many of the larger offshore vessels. These offshore vessels now are forced to go further afield. Also, the government has refused to allow unlimited use of modern technology. In other words, although processors want to use large freezer trawler vessels, in

general, they are not permitted to do so. Thus, in the opinion of Nova Scotia processors, they cannot fish for the under-exploited, unconventional species like squid or hake that are relatively close in on Scotian Shelf banks. So they want their fair share of the more distant conventional resources. Hence, the conflict between Newfoundland and Nova Scotia. These arguments go on and on and on. This jockeying for position is a direct outcome of the declaration of the 200-mile zone.

EXPERIMENTS

The federal government in this situation has taken a number of interesting steps, the latest of which is to develop a sectoral management approach in which the region is divided into three major sectors, with an attempt to confine offshore vessels within their individual sectors (Sector Management of Canada's Atlantic Fisheries, 1981). Furthermore, the expectation is that, while the inshore vessels now are rather free to move wherever they want to go, they also would be confined reasonably close to the traditional community waters in which they have always fished (that is, the waters known to those few, small communities that are in close proximity to each other).

This type of partitioning within the 200-mile zone is very significant. It probably will take at least another five years to work out satisfactory arrangements.

A very innovative concept called enterprise allocations was put into place in 1982. This concept provides for company quotas of groundfish. Whenever an overall quota is set for an offshore stock, there would be automatic agreement upon how the stock would be allocated. The advantage of doing this is that capture can be spread out in time rather than having a scramble. That is, people would not be trying to catch the quota in the first period of the open fishing period. The idea is that companies should distribute fishing effort over a longer time span, so as to make better use of their shore-based processing facilities. This idea is a very interesting one which has taken hold with the companies on an experimental basis. However, it does depend on the health of the companies. In relation to this point is the question whether enterprise allocations can be treated as a permanent property right.

How far can one expand this idea of individual allocations and quotas, especially in fisheries involving a large number of boats? The government has tried other interesting experiments in efforts to answer that question. The major experiment now appears to be a failure, unfortunately. This is the case of the Bay of Fundy herring, where the government converted in only a year's time span what was a rather low-priced meal fishery into a high-priced food fishery, based on export to Europe of adult herring. Vessels that were catching herring for \$50.00 a ton fish meal from 1976 started catching the same fish now worth \$400.00 or more a ton as a food fish by virtue of a policy decision not to allow the use of quality herring for fish meal.

In order to make this transformation work, the government decided to restrict the number of vessels that could enter the fishery, and to allow the fishermen the flexibility of fishing or not fishing according to market prices. A cooperative was established in southwest Nova Scotia, with a fixed number of purse seine vessels. These fishermen, it was agreed, would not fish unless they had a guaranteed market for their fish. This decision was made on a night-by-night basis.

In the early stages of the experiment, the government provided a further mechanism to keep the shore-based processor prices high by allowing "over-the-side" sales. These are sales of freshly-caught herring to vessels from Europe, or anywhere else, if the local processors would not purchase available fish at a high enough price. This system worked very nicely for the first few years. It was initiated at a time when the North Sea stocks of herring were at a very, very low point. However, in the last few years, with the softening of European markets, as North Sea stocks rebuilt and as economic conditions deteriorated, the whole system has collapsed, and we are seeing the price decline right down almost to the basic levels of fish meal once again.

This is a rather simplified account of this very depressing situation, with discouraging implications for other attempts at fisherman-based social organization. This attempt to have the fishermen themselves participate in the process of price-setting and to make the decisions about how much of the resource to take was widely believed to have potential applications in other types of fisheries.

These cases and a number of others were examined by the Economic Council of Canada (Scott and Neher, 1981). This was a study commissioned by Prime Minister Trudeau to look at various industries in Canada that are afflicted with a high degree of government regulation. The Council study concluded that the fishing industry was the most over-regulated. The burden of regulation should be reduced for both the processors and the fishermen, according to the authors. But, in fact, what the government is trying to do is establish new sets of regulations that are perhaps more sweeping and more confusing to the fishermen. It may become more difficult to try and understand whether one is on the right side or the wrong side of the law. One of the conclusions of the Economic Council of Canada study was that a fisherman literally could not untie his boat without breaking the law at some point. There is a great need to untangle this web of regulations, some of which are very old and others of which are very much a consequence of the experimentation that has been carved out over the last five years as a consequence of the 200-mile zone. Furthermore, fishermen are confused. They often find it difficult to distinguish between pronouncements which are really strong suggestions and legally-enforceable regulations.

COSTS, EFFICIENCY AND POLICY DILEMMAS

A recent report of the Institute for Research in Public Policy, based on a study carried out at Dalhousie University, documents the amount of public assistance being provided in the east coast fisheries at the present time (Weeks and Sommerville, 1982). The administrative costs to regulate the fishery amount to \$163 million at the federal level and \$36 million at the provincial level. The Unemployment Insurance net benefits (after extracting about \$3 million which the fishermen pay into the scheme) amount to \$50 million a year. Finally, the various kinds of gear subsidies and loans for vessel construction and such amount to roughly another \$40 million. These figures total \$294 million a year, an amount equivalent to two-thirds of the landed value of the fish caught in the region. To many people, and particularly resource economists, this is clearly an unacceptable situation.

But it also poses a major dilemma. The east coast of Canada has a very large number of fishermen, with relatively limited alternative occupations. The more than fifty thousand fishermen mostly live in small isolated communities of Newfoundland and Nova Scotia. Some of these are prosperous communities and there are some very rich fishermen. Captains can make \$100,000 or more a year and deckhands on some of the larger vessels make \$30,000 a year. However, many are well below poverty line figures.

The dilemma that the government faces in light of this post 200-mile declaration experience, now that euphoria has worn off, is making the hard decisions about the extent to which the east coast fisheries should be managed with social objectives in mind. The cost might be even higher if many fishermen are put out of work as a consequence of fleet rationalization.

This dilemma has another aspect related to the question of fuel costs and the efficiency of fishing operations by various classes of fishing vessels. Evaluation of the cost of trawler operations has revealed that in fact many of the inshore and smaller offshore vessels turn out to be the most efficient at the present time (Jangaard, 1981). Many of the large wet trawlers are money losers. This finding has implications for the numbers and style of fishing which are sure to further fuel the debate over gear conflicts and most appropriate fleet type.

INTERNATIONAL NEGOTIATIONS

The final question concerns the degree to which Canada is really utilizing its resource within the 200-mile zone. It is very clear that presently under-utilized species may remain under-utilized for a number of years. That, in turn, will bring considerable pressure from other nations to have a greater sharing in Canada's resource space, from which they have been excluded in recent years. The pressure already exists for access to conventional resources. For example, Spain has, according to the Canadian government, taken great liberties with

the cod resources just outside the 200-mile zone, in order to gain access to fisheries inside the zone. Similarly, the European Economic Community has maintained trade barriers which hinder Canada's further penetration of markets there. It is clear that Canada is prepared to allow the EEC greater access to the Canadian 200-mile zone in exchange for certain marketing rights.

Finally, if one looks at the situation that has developed between Canada and the United States over the Georges Bank boundary dispute, it is clear that a difficult time lies ahead on the question of fish allocation between nations. There may be another ten years of back-and-forth negotiating before there are satisfactory stock allocation arrangements.

CONCLUSIONS

What has the 200-mile fishing zone declaration produced for Canada and the east coast? In resource conservation, perhaps the situation has improved more than one might have expected. Some stocks are rebounding more quickly than anticipated, especially the groundfish stocks. There are stock assessment problems and puzzles to be studied. A great deal of interest will be taken in multi-species management, including optimization approaches that will involve radically different interpretation of how one goes about harvesting species. For example, deliberate efforts might be made to fish-down some valuable stocks in order to take more of another kind of stock.

Stock allocation at the moment is the area of greatest contention. As long as there are fish around, there will always be some argument over who is to get those fish. However, it seems that for at least another five years there will be intense bickering, both within Canada and with the U.S.A. and some European countries.

Finally, a major topic that we seem to have missed totally in the earlier days of the 200-mile zone is gaining prominence. No matter how much fish a country may have, unless they can be marketed, and unless a quality product can be put out to the world, the industry is in a perilous state. Canadians appear to have discovered these facts only in the last two or three years. This problem of marketing will be a major focus for attention by all elements of the industry over the next few years.

In conclusion, it may be stated that early expectations underlying the 200-mile fishing zone declaration have not been fully met up to the present time. While benefits have been substantial, overanticipation has led to a situation of grave circumstance for processors, and a great deal of uncertainty about the future of coastal communities in Atlantic Canada.

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THE UNITED STATES-CANADA FISHERIES DISPUTE

Burdick H. Brittin

If one measure of difficulty of a problem is the length of time it has been around, then our fish problem is difficult indeed. I am neither brave nor foolhardy enough to suggest a direct answer to the problem that has so long plagued this otherwise peaceful corner of the oceans. We need true wisdom for that task. For our purposes wisdom requires the fortuitous coincidence of a fishery resource disaster with a congenial political climate. Practically everyone here is familiar with this. Our fisheries dispute in the Northwest Atlantic has sputtered, and sometimes thundered, for hundreds of years; first between the United States and Britain, and then between Canada and the United States. Sometimes wisdom, coupled with boldness, has dampened the dispute, but at this point we must face the unhappy fact that a solution has still escaped our grasp.

It must be bemusing to the world community to witness this ancient confrontation between two of the richest, best-fed and happiest of nations, glaring at each other in frustration at their inability to govern a vast common resource -- their Atlantic fisheries. All of us appreciate that this long-standing unsatisfactory situation must be changed. It serves no useful purpose for either to change the other with terrible behavior. What we must try to do is agree on where we should go from here. Let me turn, then, to some of the international factors or realities which I think are pertinent.

The first reality is a set of paradoxes:

The seas are ancient, yet they are new. Their regimes are immutable, yet they are fragile. They are catalysts for progress, yet platforms for discord.

What is new and generally fragile about the oceans are those mechanisms, practices and legal regimes of man governing the uses of the oceans. An ocean regime made by man is fragile indeed if the natural processes of the oceans are ignored. Generally, the world community can be proud of the progress that has resulted from man's use of the seas and the exercise of freedoms on the seas. The lives of nations and peoples throughout the world are inescapably tied with the oceans. Indeed, one of the factors that make Canada and the United States what we are is the ocean and the promise it holds out to us. It is not the oceans themselves that make for progress or discord. Disputes are man-made, and so are solutions. In our context, solution depends on the Canadian and U.S. fishermen themselves. If they are not forced by economics to come to grips with the situation, then it will never be solved, because it will not be seen as a problem.

That brings us to the second reality:

I am master of the earth but the law is the mistress of the sea.

As Roman emperors went, Antoninus was not particularly distinguished, but he did have the profound perception to produce this message for posterity. I do not think it is necessary, in this forum, to demonstrate the validity of the Emperor's proposition, except to point to the efforts of the world community to establish and codify the law of the oceans -- a body of law which certainly expanded as the world community developed new uses of the oceans. It is startling to contrast the text produced at The Hague Law of the Sea Conference of 1958 with what has been produced through the United Nations in this past decade.

As to our own bilateral problems, when the negotiations of 1978 and 1979 were put in limbo, it seemed clear that a primary reason for failure to achieve ratification was the fact that both countries were being asked to limit their fisheries geographically when in fact no boundary had been established. Faced with this failure, both of our countries agreed to initiate the process of establishing a boundary through the use of an international mechanism: a five-member panel established by the International Court of Justice for that purpose. In doing so, both Canada and the United States gave witness to Emperor Antoninus' principle: in accepting the Court's jurisdiction, both countries are bound to the boundary established in accordance with the law. It required a degree of true grit for both countries to make that mutual decision, for wherever the boundary is drawn, they cannot both be gratified by the outcome. In the final analysis, the resulting boundary will serve as a most visible keystone upon which to rebuild a common appreciation of the values and interests at stake. There is no real alternative to a boundary based on law.

Let us turn to another international reality. In commenting upon the finally agreed title of the Preparatory Committee for the Law of the Sea Conference, (the Committee on the Peaceful Uses of the Seabed and the Ocean Floor Beyond the Limits of National Jurisdiction), Ambassador Pardo of Malta said:

In this well-trying and eminently successful tradition, we all understand that the title of our committee is a misnomer and that its real title should be "The United States Committee for the First Partition of Ocean Space in the Interests of Coastal States."

Indeed, it can be said that the "political reality" of the past 20 years has been a very strong desire for the acquisition of more territory or jurisdiction, particularly by Third World countries. Neighbors and friends, in many cases, ignored the essential question whether resources were absent or present in the areas off their own coasts, and joyously acclaimed the 200 miles of jurisdiction for a variety of fishery and other

purposes. Whether this will prove to be beneficial to them individually, and to the world community at large, has not yet met the test of time. The rush was so great that the poor landlocked and otherwise disadvantaged states, such as Bolivia and Singapore, became even more disadvantaged in the rush for expanded jurisdiction.

For Canada and the United States both, the notion of expanded jurisdiction for fisheries has had a great deal of public appeal. I am not sure of the figures for Canada, but my understanding is that the area of fishery jurisdiction acquired by the U.S. equalled 90 percent of all U.S. land territory, and potentially this brought under its jurisdiction the richest fishing areas in the world. Possibly this might also be said of Canada. Suffice it to say that insofar as coastal fisheries were concerned, two rich countries became richer.

I am not suggesting that the clock be turned back at this point, but I would note that for our two countries the extension of fisheries jurisdiction in the form of an exclusive economic zone compounded our fisheries problems and disagreements. The United States and Canada are not alone, for indeed, similar problems are emerging in other places of the world, usually between one country which has good fishery resources off its coast and its neighbor which does not. What distinguishes the Canadian-U.S. Atlantic problem is that both countries have rich fisheries off their coasts.

If my information is correct, the present situation is that there are no common conservation measures in force governing the catch of the principal species in dispute, including cod, haddock, flounder, scallops, and other stocks. Because they were in reality common stocks before our countries extended their jurisdiction, accommodation was more easily reached. Now, however, one has to fear for the health and well-being of the fishing fleets of both Canada and the United States, because with no joint conservation measures in force stocks are more vulnerable to overfishing and consequent depletion. What then is the impact on the fleets, including the present surplus trawlers? The plain and sorry fact appears to me to be that at this time nationalism is a stronger driving force than the need for adequate management of the fisheries. Ambassador Pardo appears to have been right.

The fourth fact of ocean life is, in a way, related to Ambassador Pardo's thought:

The division of the oceans into large, separate zones, within which a single state has exclusive and nearly comprehensive authority to make decisions, is neither compatible with the nature of the ocean and the processes occurring within it, nor with most of the resource base available in it, as well as the need for its investigation and understanding.

Professor Burke rests his proposition not on political factors but on the more perpetuating elements of nature that

govern the ebb and flow of the seas. There is very little that man can do to alter or change these immutable characteristics of the natural oceans. Man can, through investigation, learn a great deal about the oceans, its resources and its processes, but when these endeavors are limited in scope by restrictions imposed by man, then not only the host state, but also all states, will suffer the consequences of lack of knowledge. I believe both of our countries fundamentally believe that in the broad view of things they gain by mutual effort. There is a loss in separate and restricted efforts. Both of our countries accept the fact that the oceans are now divided into large, separate zones, but surely accept that we must use such divisions as multipliers for cooperation, rather than serve as a divisive element between us.

Those are pretty high-sounding phrases. How do they apply to our venerable fisheries dispute? There are many fishermen and associated interests who apparently feel that they will be happier and healthier when a boundary is drawn. This would be grand if someone would figure out how to build a barbed wire fence in the ocean and teach the fish to remain in their own pasture. Each country would have its own domain. But does that approach really promise to deliver a long-term solution profitable to the fishermen of both countries? I think not. Cooperation between U.S. and Canadian fisheries interests will produce more fish for more fishermen and, incidentally, be consonant with Professor Burke's admonition.

The last international factor is even more directly applicable:

Where the same stock or stocks of associated species occur within the exclusive economic zones of two or more coastal states, these states shall seek either directly or through appropriate sub-regional or regional organizations to agree upon the measures necessary to coordinate and ensure the conservation and development of such stocks.

While the final outcome of UNCLOS III is being questioned at this time, it should be noted that the above language from the Draft Convention survived the scrutiny of three reviews by the Conference as a whole. It is not really new law so much as a reduction to treaty language of a principle that has been in existence for a long period of time. I might say that that principle was important to both Canada and the United States in deliberations and negotiations with other countries over a long period of time. While the language is declaratory of a living principle, the governing word "shall" is intended as a directive for the course of conduct of countries in our situation.

Do I feel a solution will eventually be obtained? Yes. But I submit that those concerned with the dispute must look to the international facts of life I have tried to describe. Understanding them and, indeed, daring to utilize them, should serve to make the path clearer.

GLOBAL FISHERIES MANAGEMENT: THE NEW CHALLENGE

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INTRODUCTION

The theme of my presentation is perhaps best described by enumerating seven basic propositions:

- (a) There were serious shortfalls in the performance of global fisheries management before the advent of extended coastal state jurisdiction;
- (b) The shortfalls were done chiefly to the open access system, an undefined system for the allocation of fish stocks;
- (c) Extended jurisdiction has in principle provided the coastal states with the authority to remedy this problem;
- (d) The coastal states have not, under extended jurisdiction, developed appropriate policies and principles to utilize that authority;
- (e) Without these principles and policies, we are worse off, because we retain all the problems of the old regime, and in addition we have new problems of allocation and active management;
- (f) The world community needs either to accept minimal performance of fisheries management or to change the setting under which fisheries management operates, so as to make it more consistent with the new, more authoritative regime; and
- (g) The U.S.-Canada east coast fisheries dispute is just a special case of the global problem, and it ought to be dealt with in terms of the principles and policies which are emerging from the new regime, not as a simple boundary problem.

In discussing this theme, first let me tell you something about the history of how we got where we are today in global fisheries management.

Second, I would like to discuss the new realities of fisheries management that have been generated by the unilateral extensions of jurisdiction by most of the coastal states.

Third, I would like to enumerate what I see as the emerging principles for policy development in world fisheries management.

The world fisheries have changed dramatically since the 1960's, when annual landings and fishing industries were growing rapidly. Now growth appears to be virtually stagnant despite the dramatic changes in coastal state jurisdiction. In the 1960's recorded global landings were increasing at 7 per cent per year. It was forecasted that the global protein deficit would be significantly reduced as a result of increased fish catches. The construction of fishing vessels and gear was

booming and to most observers it was generally inconceivable that there would be a time just two decades in the future when fisheries production would stagnate and even show evidence of incipient decline.

Despite the optimistic forecast of the 1960's, serious concerns were voiced regarding the stewardship exerted by the community of individuals who managed, harvested, processed, or otherwise utilized the world's fishery resources. These concerns derived from the fact that many stocks were overfished or becoming overfished. Many stocks were fished in an economically wasteful manner, dissipating large amounts of economic rent. Scientific and technical information, while providing useful information on the long term behavior of fish stocks under various intensities of fishing effort, failed under critical circumstances when information was required to provide management guidance for next year's fishery. Moreover, in a number of instances, managers and decisionmakers showed a lack of will to take the decisions and implement the actions that would change these undesirable and negative characteristics of global fisheries institutions.

These undesirable characteristics were generally attributed to a common cause, the open access regime. In that regime, anyone could fish the resources whenever he wanted. Unrestricted entry into the fisheries meant that the profitability of established fishery operations could be substantially reduced or eliminated as additional vessels entered the fishery without restriction. This, of course, heightened the perception of investment risk, and the heightened perception of risk induced fisheries to operate on a first-come, first-served basis, stimulating intensive fishing on individual stocks, reducing the biomass of each of them to historically low levels. Then, after each stock was depleted, the fleet would move on to a lightly fished stock, or a stock that had not yet been fished, further reducing the fishery productivity of the world's oceans.

In the early 1960's, global fishing effort was at a relatively low level. In that period the problems of overfishing, of economic waste, and of inadequate fishery management institutions were not nearly as evident and politically contentious as they became after substantial increases in global fishing efforts in the late 1960's and throughout the 1970's. Before these increases in effort, the results of bad management tended to appear relatively inconsequential, as fleets had options to move from heavily fished stocks to lightly fished or unfished stocks. As the total global fishing effort increased, these options were foreclosed, seemingly amplifying the negative characteristics of fisheries management. The increased fishing effort in the late 1960's and the early 1970's thus intensified the maladies afflicting fisheries management. The common view of the root problem, however, was that it did not evolve from the open access regime per se, the quantity or quality of information available to managers, the soundness of management decisions, or

the implementation of those decisions, but rather from virtually uncontrolled fishing by distant water states fishing in waters off the coastal states.

While all of this was going on, the United Nations Conference on the Law of the Sea came into being. Over the years, as the process leading to an acceptable draft treaty became more and more drawn out, those coastal states that perceived high political or economic stakes in excluding foreign fishing operations from their 200-mile zones, or otherwise perceived a need to control fishing in their zone, unilaterally extended their fisheries jurisdiction. By the late 1970's, most coastal states had some form of fisheries jurisdiction. The principal purpose of the extension of jurisdiction, the control of distant water fishermen, was thus attained. The process of controlling foreign fisheries often meant increased control of domestic fishermen as well, and thus most states, explicitly or implicitly, eliminated the open access regime and attained exclusive authority to manage the stocks of fish in their coastal waters.

This has totally changed the institutional framework of fisheries management. Through extended jurisdiction most states have increased and tightened authority to manage fish stocks in their fishery zones. Increased authority implies more effective management and heightened expectations for a greater return to the coastal states from the fisheries resources. There is no question that the imputed value of global fish stocks has increased substantially, because coastal states now have the authority to control or manage fishing by both distant water fishing fishermen and their own nationals.

On the face of things, extended jurisdiction could result in substantial benefits. Economic wastes could be minimized, and increased returns to society, without necessarily increasing the catch, could be significant. Improved management and concomitant reduction in investor risk could increase and direct investments toward new opportunities in fishing, and these could certainly result in increased benefits, possibly even increased employment. In addition to increasing absolute wealth generated by the fishing resources, opportunities could be enhanced for more efficient and equitable distribution of fisheries wealth, both among the industries and between the rich and the poor.

But these great expectations for extended jurisdiction in the 1970's have not yet materialized. Some five years later, after most coastal states have extended their fisheries jurisdiction, we now recognize that simply claiming authority over distant water fishing by coastal states was a piecemeal and simplistic solution to the problems of fisheries management. We have further realized that the simple declaration of management authority without a philosophical commitment to develop the underlying management system will be of little benefit to the coastal state.

So, while some advances have been made as a result of extended jurisdiction, many of the old problems have remained and, as I said before, new ones have been created.

What are some of these new problems? First, extended jurisdiction, while eliminating distant water fishing from the waters of the coastal states, has not provided in itself a mechanism for maintaining catch levels in those areas where coastal states cannot replace distant water fishing effort with domestic fishing effort. We see this situation, for example, in Southeast Asia and Africa.

Before extended jurisdiction, management tended to be passive, in the sense that quotas were ineffective because they were set to match the capacity of the international fleet, rather than to satisfy well defined economic or biological principles. But now, with extended jurisdiction, quotas are set so that they in fact constrain fishing effort. As a result, the scientific and technical questions regarding the magnitude of the quota come under considerable scrutiny and contentious challenge. We see an increased falsification of fisheries statistics to obviate the effects of the quota.

We also see a perceived need to engage in inordinately costly enforcement programs. This is of considerable concern to every policymaker. But there is a serious question whether the traditional fisheries management paradigm, "go out and collect statistics, use these statistics to develop some management advice, set the quotas, and then enforce the quotas," will even work in a cost effective management system, where quotas are actually an effective constraint on fishing.

I should make that clear by giving an example. Under the eastern tropical Pacific tuna regime, the total allowable catch has tended to increase with the capacity of the fleet, rather than on the advice of biologists. If you have a quota that doesn't constrain the catch, that's only a quota in name.

Another new problem is that extended jurisdiction has obviously extended or created a number of new boundaries between the coastal states and, in some instances, between the coastal state's fisheries zone and the high seas. It was first thought that, since distant water fishing was eliminated, there would be no need for international organizations, as there would be no international fishing problems. This obviously has not been the case, since many stocks cross international boundaries. Note here that the problem of so-called "highly migratory" fish, such as the tunas, has become in principle not too much different from that of mackerel in the Northwest Atlantic. The question is simply, how many boundaries do the fish cross? As long as they have at least one boundary to cross, a transboundary problem arises. The need for more effective international organizations has become critical, since there still have to be mechanisms to determine how the fish are to be allocated among the coastal states, how technical information on the status of the stocks (which is critical to conservation strategy) is to be exchanged, and how mechanisms can be developed to undertake effective joint research on the stocks.

By placing strict control on distant water fishing, extended jurisdiction has put new emphasis on the management of coastal fisheries, including most of the artisanal, traditional

fisheries, both of the developed and developing countries, as Professor Hanson has pointed out. I think it is important to recollect that over half of the edible fish in the world are caught by small-scale, artisanal, coastal fishermen rather than the big industrialized fishing enterprises. Yet, despite the substantial change in the global fisheries management regime, there has been surprisingly little change in fishery management systems to make them more consistent with the new apparently more controllable closed access regime.

By the simplest analysis, society has two choices. Either we can take a *laissez-faire* approach, or attempt to formulate systematically the requirements of fisheries management under the new regime, and by so doing, influence the implementation of new and more efficient management systems. If society takes the first choice, and attempts to muddle through with incoherent and ill-defined fishery management architecture, it stands the chance of foregoing benefits that would be attained from better management systems perpetuating less efficient management practices which would become ingrained and difficult to terminate.

If we are to take a new approach, I think that we have to recognize the new realities of extended jurisdiction. As I see things, the first problem is that fisheries management traditionally has not taken account of the individuals involved and their motivations. Traditional fisheries management has generally dealt only with the interaction between the fishermen and the fish. Now that we have a better appreciation for the economic forces which drive fisheries, we can see that there are many different motivations, even among investors in fisheries, and because of this, there really can be no single objective for fisheries management. It turns out that the objective really becomes a variable and a moving target, and management has to take this into account.

Second, although it eliminated one kind of open access problem, extended jurisdiction has created another. It created a jurisdiction over a geographical area, but not over entire stocks of fish. A coastal state can control fishermen operating in its own geographical area, but if those fish go beyond that geographical area, then control over the fish stock is lost and, in that sense, there is an additional issue of access to the stock. This kind of problem has remained unsolved, for example, in the United States, where the Fisheries Conservation and Management Act (the Magnuson Act) cannot deal with the everyday situation of fish which cross the border between the U.S. and Canada, or between the U.S. and Mexico. It is hard for the U.S. to set a total allowable catch and then allocate a surplus to a foreign country. There has to be some joint arrangement to work this out.

A third reality is that traditional fisheries management, as we think of it, probably won't work. Traditionally, the management collects statistics, writes rules based on these statistics, and then tries to enforce the rules. In practice, fishermen don't report their catches accurately; the rules are

not efficient in taking into account year-to-year variations and variability in the stocks; and enforcement is very costly.

Fourth, governments involving themselves in the details of management have turned out to be fairly inefficient. Governments should probably lease stocks to industries and make sure that the industries perform in the public interest. In the case of the Bay of Fundy herring fishery, which Dr. Hanson described, the failure may have been due less to management policy or practice than to the market forces and the world herring fishery.

Fifth, the requirements for technical information have increased. The imputed value of stocks has gone up, and because it has gone up, it makes more finely tuned management information essential, especially information related to recruitment or the year-to-year variation in fish stocks. This is a complicated scientific problem, which probably should be the focus of most of the world's fisheries research effort in the next several years.

Sixth, international organizations have, as I have pointed out, become more important, but they have been basically ignored in the inter-regnant period between the advent of extended jurisdiction and now.

Seventh, the artisanal or traditional fisheries have also become much more important, and basically they have been dealt with in terms of a traditional fisheries management problem, but we are coming to realize that managing these fisheries is really a problem in rural development and rural economic development, and that calls for restructuring of the problem.

Finally, the environment has become much more important as the value of fish has risen. Those of us who attended the discussion yesterday afternoon on marine pollution recognize that, while we know the quantities of some of the pollutants that were introduced in the sea, we have little idea to what extent, when a fish stock increases or decreases in abundance, that increase or decrease is due to pollution or some natural causes. Because of that uncertainty in the environmental sciences, it is difficult to make decisions.

So, if we take these realities into account, we are left with seven principles of policy development in contemporary fisheries management.

1. The economic performance of fisheries is determined by forces that stimulate investment or disinvestment in the fisheries, and so control of performance may depend more on controlling investments than on controlling fish-fishermen interactions, which is the traditional approach to fisheries management.
2. The nature of access has changed in two fundamental respects. First, the coastal states now have extensive authority to control fishing in their fishing zone; and second, authority over a number of stocks is not exclusive, since the range of some stocks crosses interstate boundaries, such as the boundaries between the seaward

extension of the fishing zone and the high seas. The new authority in the fishing zone places emphasis on determining the best way that that authority might be used to increase benefits, and the lack of exclusive control over stocks places emphasis on the development of new arrangements among the sovereign states regarding management. These two points are, of course, the crux of the U.S.-Canadian fisheries dispute, and they are not being addressed directly.

3. The requirements for information, data, and new management concepts under an "active management" (extended jurisdiction) regime are bound to be different, and probably more rigorous, than those for a "passive management" (open access) regime. Paradoxically, the higher imputed value of fish in an extended jurisdiction regime should warrant a greater expenditure in this area. It may be that the expenditures in developing new concepts and information would have to increase exponentially rather than linearly, and hence might not be economically warranted. Yet the problem of predicting recruitments is of intrinsic importance, because it lies at the heart of the problems of developing year-to-year management strategies, rebuilding depleted stocks, evaluating anti-progenic effects on fish stocks, and understanding the interactions among species in multiple-species fisheries. Serious in-depth evaluations of these problems are needed and support somehow has to be generated in those critical areas of fishery management information.
4. Whatever their form, governments generally play a critical role in the performance of fisheries management. Their actions or inactions can have an important influence on fishing performance. There is a building opinion in a number of quarters that, where there is public sector control of a private sector, the management of the sector could be made more efficient by reconfiguring public control strategy to operate only at the level of what is acceptable to the public. This would provide the private sector with incentive to behave more in the interest of the public. Governments might then redirect their activities into developing information to make the fisheries system work more effectively.
5. International and regional organizations will ascend in importance. The lack of exclusive control over many stocks, the need to gain economy of scale and research, the need to exchange data, and the possibility of economic interactions suggest that these organizations can play an exceedingly important role in the extended jurisdiction regime. For maximum effectiveness, strategies for organizations need to be developed which take into account the successes and the failures of the organizations which operated under open access, as well as the special needs of coastal states.

6. Fisheries constitute an important basis for economic and social development, not only in the developing countries but in economically disadvantaged regions of the developed countries as well. The full utilization of fisheries for economic and social development will require us to view the problem as more of a problem in rural development and reform than as a fishery problem. In other words, fishery policy will be subsidiary to development policy.
7. The traditional management paradigm operating in an "active management" (extended jurisdiction) setting may have serious difficulties. The sources of these difficulties need to be flushed out, evaluated, and changed. It may be that change is not possible. When all is said and done, it is problematical how fast global fishery policies in the 1980's will come to grips with the adequacy of the traditional fisheries management paradigm. If we are to see a large improvement, we will need to see a change in the setting under which fisheries operate. This change in setting will need to be built on a philosophical foundation of just what fisheries management should and should not control.

To be sure, questions of feasibility will remain, but right now we need to focus our attention on what is desirable. Closing the gap between what is merely feasible and what is desirable requires only one ingredient, and that is leadership.

In closing, I like to think of the remarks John Herman Randall made in 1927:

If men's minds are a mosaic or a palimpsest of belief upon belief, it is of the highest importance that they understand the life-history of those beliefs, why they are there, and whether they are justified in being there or should be discarded. What have been the great waves of thought and aspiration that have left these successive deposits? What did they mean when they were at the flood, what of value for to-day have they left, what must men seek out anew for themselves in the never-ending task of rebuilding civilization? When one has reached an understanding of what materials are furnished by the world around about him, and what resources had can hope for inside himself, it still remains for him to appraise the past as it is appropriate it, and to become its master. (John Herman Randall, The Making of the Modern Mind (1940), at p. 6.)

If we took John Herman Randall's advice a little more to heart, I think we'd be getting closer to the fundamental issues of fisheries management, as it will have to unfold in the coming decades.

DISCUSSION AND QUESTIONS

THOMAS CLINGAN: I applaud Dr. Rothschild's seven management principles and endorse them heartily. He seemed to be suggesting that they were not understood in U.S. fishery management articles; or that, if they were understood, they had either been rejected or ineffectively implemented. I wonder if he could clarify which of these allegations he would make. Does he view the regional fisheries management council system created by the Magnuson Act as an ineffective device for implementation of these management principles, or are there other defects in the system that ought to be corrected?

BRIAN ROTHSCHILD: I have no evidence that these principles are either being considered or utilized. Apart from coastal waters which come under state jurisdiction, all fishery management decisions in the United States are now made, since 1976, within the regional fisheries council system, and the law is written in such a way that the various councils set a total allowable catch, determine what proportion can be taken by U.S. fishermen, and the surplus is given to foreign fishermen. In the case of a transboundary stock like herring, mackerel or anchovy, there is no international mechanism to provide effective management. This is an important problem, and one that may be particularly difficult for the U.S. State Department to handle through diplomacy. On the U.S. side of things, it does not seem to make institutional sense that of a given quantity of fish loaded on deck of a particular U.S. vessel, some may come under (say) the New England Council's jurisdiction, and the rest may "belong" to the Mid-Atlantic Council. Then there is the additional problem between the U.S. and Canada further north.

Perhaps the best way of evaluating the fisheries management council system is by looking at the performance of the fisheries since 1976. Take Alaska pollock, for example. In the Bering Sea every year approximately 1.2 million tons are caught, primarily by Japanese fishermen nowadays. It is a valid question why this valuable protein is not flowing through the U.S. economy. The second example is New England. The catch has gone up since 1976, but if adjustment is made for inflation, the gross value of the catch has gone down. On top of that, the number of fishing vessels has increased considerably. Is that good management? Probably not. Moreover, a few of the councils (e.g., the South Atlantic) have not yet prepared any management plans.

GIULIO PONTECORVO: Perhaps I could exercise chairman's prerogative and make a comment. In my view, the institutional arrangements for fisheries management in the United States have led to gross economic failure, and will continue to do so until they are modified. The *de facto*, if not *de jure*, transfer of authority from the federal to the regional council level was a

step backwards from every fishery management viewpoint. The Councils are essentially producers' cartels, and what they are optimizing is the interest of the producers. They simply do not pass the test of general welfare, which I take to be a reasonable social objective of fisheries management. Even more serious is the fact that, with its more limited authority, the federal government has not dealt with the basic problem of limitation of capital and labor in the industry. Accordingly, there has been no increase in profitability, either in the U.S. or Canada, despite increased catches and increased capacities in certain sectors of the industry. Therein lies the failure, and the failure will continue until such time as the central substantive issues of fisheries management are properly addressed.

GORDON MUNRO: Dr. Rothschild emphasized the fact that in moving to extended jurisdiction, we have moved from open access to a type of closed access. I don't think it can be overemphasized that, in so doing, we have mitigated some of the effects of open access, but we are still a long way from eliminating these effects. In Canada, although we don't have the federal power-sharing problem in the same degree as in the U.S., we too have had difficulty in dealing with the open access problem through limited entry policies. Dr. Hanson has referred to the inshore fishing problem in Atlantic Canada. In Newfoundland, in particular, there was a low level of participation in the inshore fishery at the advent of extended jurisdiction. What the government did, as the stocks were recovering, was to sit back and do nothing until there had been a massive inflow of fishermen. When it was too late, it tried to effect limited entry into the fishery.

The situation is also serious on the processing side. Rents can be dissipated, as it were, through the processing sector as well as the harvesting sector. The extensive overbuilding of processing plants is really an example of the failure to limit investments.

In conclusion, perhaps I could address a question to Dr. Hanson about the failure of the Bay of Fundy experiment. I believe the harvest quotas in that experiment were not transferable. Was that a factor in the failure, or was that irrelevant?

ARTHUR HANSON: It's a complicated story. It all started with a single organization dealing with a single-gear technology, that is, the herring seiners. But bickering broke out among various groups, and the gill netters became involved as well. Indeed the latter gained some real advantages in the early stages in terms of price, as a result of the original herring cooperative. But the bickering led to disputes over allocation between the gill netters and the seiners. Second, the seiners formed several cooperatives and lost their original solidarity. But the most serious problem came with the fall in market prices. When the processors said they could not pay the

prices the fishermen wanted, the government in 1976 allowed in the foreign fleet to keep up prices through over-the-side sales. With increased pressure on the processors, the market softened as the traditionally hostile relationship between processors and fishermen returned to displace the processor-cooperative relationship that the government was trying to foster. People started selling outside the cooperative arrangement.

It also seems there was a lot of overfishing. It turned out the government was unable to set a quota and enforce it. Part of the blame lies with government for setting an unrealistic quota, and failing to understand what was really happening. What was happening was that the fishermen were catching and selling fish of various qualities, and the processors were marking and filling in the tags with virtually any value they wanted. This, of course, distorted the picture of how well the cooperative arrangement was working, led to dissension within, and eventually to serious financial problems for the cooperative.

In retrospect, we see that too many boats were allowed into the fishery, and expectations for the cooperative were unrealistically high. Perhaps it's not too cynical to suggest also that within the federal bureaucracy many of the administrators were just as happy to see the experiment fail, since in a sense it threatened to erode the control they had acquired. I think we have to expect that any radical change in fisheries management is likely to meet with considerable bureaucratic resistance. To effect any significant change it may be necessary to bring in people from outside -- and I suspect this is true in the United States as much as in Canada.

Finally, we still have to learn how to put experiments in fisheries management within an appropriate, five- or ten-year, time-frame. It is not good enough to switch quickly, almost overnight, if the first year fails to come up to expectations. Not least, a longer time-frame is needed to allow the fishermen to adjust to a basic change in policy. Government regulation is perceived by fishermen as part -- a large part -- of the risk they assume. They need time to adjust to a change in the risks inherent in government regulation, since the success of the experiment depends largely on their perceptions and resulting behavior. Judging from the Bay of Fundy herring situation, I would say red tape clearly is still a very significant problem for the fishermen.

BRIAN ROTHSCHILD: Variance of the stock is another critical aspect of fisheries management. In some tuna stocks, for example, the ratio between the largest and smallest fish may be 3 or 4 to 1. In the case of herring, the ratio may be 30:1, or as high as 100:1. The question of recruitment forecasting is one of the most difficult questions in fisheries biology. It is also an important problem in fisheries management, because how a fisherman or a fleet exploits a stock depends on how well the variability of the stock is understood.

It is equally depressing to witness the cyclical nature of fishery failures. Limited entry schemes that I am familiar with seem to follow a set pattern. First, the government limits entry in one form or another, then gets involved in expensive buy-back schemes, so that the fishermen who remain in the fishery usually make a good initial profit. But as they make their equipment more efficient, they increase their ability to generate fish mortality, the stock decline, and they are back where they started. At that point, no one has the courage to limit entry even further. So the system always tends to be in a state of shambles.

I think this demonstrates that the simple-minded concept of limited entry espoused by economists 20 years ago -- apart from being dependent on political will, a scarce commodity -- is ineffective as a basis for fisheries management. So, what's the next step? Perhaps the next step is simply to lease out a stock to an industrial entity and let the lessee manage as best it can. The government's role would be to maintain the stock -- make sure it does not fall below some critical level -- and to make sure the industrial entity does not behave as a cartel. If it gets over-capitalized, it alone suffers, and may be replaced by another entity.

ARTHUR HANSON: One of the critical questions is what you do after the good years. If you rush out, in prosperity, and buy new vessels or electronic goodies, you might end up, after two bad years, flat on your back with a huge mortgage. Too little attention is given to the possibility of creating some kind of fund to tide fishermen over the bad years.

BRIAN ROTHSCHILD: I think the idea of an insurance system might be worth exploring. Excess profits in the good years would go into the fund to finance the bad years. Also, it might be worth introducing the system of selling futures, as in agriculture, to help stabilize the fisheries market. We still fail to treat fishery products as a commodity.

ARTHUR HANSON: Another idea along these lines is to have some form of marketing bond arrangement, although a lot of people are still nervous about applying this concept, particularly when they see some of the difficulties encountered in agriculture. In Canada, at least, we seem to be locked into this situation where there is a general expectation that the government (the taxpayer) will bail out. One sees this both at the level of fisherman with buy-back schemes, and at the level of processors who say, "Well, we are about to go bankrupt and this community is about to go down the drain -- what are you going to do about it?" Generally, large sums have been forthcoming.

GEIR ULFSTEIN: I think we agree that one of the most important features of extended jurisdiction is the phasing out of distant fishing states from the new 200-mile zones and the

central role of the coastal state in fisheries management. But, as pointed out, the problem of transboundary stocks remains, and bilateral or regional arrangements may be necessary for marketing these stocks. Do the panelists see a marketing role for international fishery organizations, or must everything be sold on the traditional bilateral basis? Do they have any thoughts on how to improve bilateral regulatory arrangements? Another question relates to the problem of enforcement: fishermen will accept strict regulations only if they see the regulations uniformly enforced in all zones affected by them. Would the panelists comment on the possibility of joint enforcement by neighboring coastal states?

ARTHUR HANSON: In dealing with both questions, I think we must expect a good deal of experimentation in the years ahead. But it may be several years, unfortunately, before most coastal states discover the full extent of the need of cooperation with neighboring and other user states. Cooperation may not be accepted as a necessity until there is a real crisis in a particular stock, which would cause considerable economic damage to the fishermen. At the administrative end, part of the problem lies in the fact that every few years new people with no international experience come into office, and this tends to mean that the wheel has to be re-discovered all over again.

PHIPHAT TANGSUBKUL: My question relates to state practice; specifically, implementation of the new Convention on the Law of the Sea. My own country, Thailand, has an important fishing industry. We used to rank seventh in fish landings. Recently we started to expand our fishing activities to more distant waters: everywhere in Southeast and South Asia. But, of course, most of the coastal states in these regions have established 200-mile zones, and many of our fishing boats have been arrested. My question is addressed to Mr. Brittin. What is the status of state practice regarding the duty to release arrested fishing boats? Is there a duty of prompt release?

BURDICK BRITTIN: Much seems to depend on whose view is sought! Perhaps the general interest is best served by extracting a monetary penalty and releasing the vessel with minimal delay. This is the way I think we should treat foreign vessels which have violated U.S. regulations, so that U.S. vessels could expect the same treatment in foreign waters.

THOMAS CLINGAN: The prompt release question was carefully considered at UNCLOS III (Article 73(2)). It was in almost everybody's interest to have a prompt release provision. Of course, in the domestic laws of many countries there have been prompt release statutory requirements long before UNCLOS III. It is just too expensive -- needlessly expensive -- to keep arrested vessels tied up in port. The UNCLOS III provision for the posting of bonds to allow for prompt release is in fact based on these existing statutory requirements. So I think the

U.S. practice is in accordance with evolving state practice, based on a combination of legal and policy considerations.

WILLIAM SULLIVAN: Would the panel care to comment on recent threats by certain coastal states to extend their fishery jurisdiction beyond 200-mile limits in response to the conduct of other states beyond these limits? This possibility has been raised, officially or unofficially, by a number of coastal states: for example, Canada, Iceland, Peru, Ecuador, Chile and Argentina.

BRIAN ROTHSCHILD: I am sure that the questioner remembers that the U.S. claims jurisdiction over its salmon, wherever they go, beyond the 200-mile limit. So other states are following a good precedent! But this is a serious problem, where foreign fishing outside the limit threatens the coastal state's management arrangements within the zone. It falls to FAO to look carefully at this problem and come up with some international solution.

BURDICK BRITTIN: Most meaningful maritime treaties probably have a lifespan of less than 30 years. The UNCLOS III treaty may not last any longer in its present form, but I think we must accept that 200 is now the magic number, and is likely to remain fixed, for better or worse, for an indefinite period.

ARTHUR HANSON: It is unfortunate, but perhaps inevitable, that some states will behave as renegades. Perhaps NAFO could be persuaded to help apply sanctions against violators.

WILLIAM BREWER: I was interested to hear the comment that perhaps the U.S. federal authorities are relinquishing too much of their control over fisheries management, and allowing "producers' cartels" to regulate their own industry. In Washington at present the tendency is to move control away from the federal government, either back to state control or back to self-regulation within industry. My first comment is that the cost of fishery enforcement -- through Coast Guard and NOAA personnel, administrative tribunals, and so forth -- is out of line with the cost of the product. But it is worth remembering that we are using fisheries now for more than just the product: for example, for the maintenance of coastal communities, and even as advancement of foreign policy in a number of ways. Given this expansion of uses of the ocean, can we really make such an exact cost-benefit analysis simply by reference to the cost of administration and the price of the product? How would the economists deal with these various spin-off benefits?

BRIAN ROTHSCHILD: Within Canada I think there is a growing feeling that the coastal waters serve a social, rather than a strictly economic, function. The question is, who should bear these social costs? It has to be made explicit whether they are to be borne by government or industry. Social costs are part of

the fisheries management regimes of the future, and have to be dealt with as such.

ARTHUR HANSON: In my view this is symptomatic of the fact that the industry is not really a form of "management". The fishing industry is essentially not profitable in the long run, and therefore is bound to fall victim to various kinds of abuses. The industry is simply not viable at the present time. In Canada at present federal-provincial issues are aggravated because of the condition of the industry.

THOMAS CLINGAN: At UNCLOS III several delegations, including Canada and Argentina, pressed very hard for a solution to the straddling stock problem, but the effort was, unfortunately, unsuccessful. Several delegations, including the Soviet Union, refused to accept any of the suggested solutions. My final comment is that I believe it is unfortunate that several coastal states are using fisheries management to attain foreign policy objectives. I think that's a tragedy. If fisheries are to be effectively managed, they must be managed for their own sake and for the sake of the industry. I hate to see our government and other governments using fisheries management policy for unrelated purposes.

GIULIO PONTECORVO: In closing this session, I would like to thank the panelists and the many commentators for their valuable contributions this morning. Thank you very much.

PART VIII

ADMIRALTY LAW AND THE OFFSHORE INDUSTRY

OFFSHORE SUPPLY AND SERVICE:
CHARTERING AND OPERATIONS

Discussion Leader John D. Murphy
Stewart, MacKeen & Covert
Halifax

JOHN MURPHY: Ladies and gentlemen, the program for this morning is "Offshore Supply and Services: Chartering and Operating." We think this is an aspect of the offshore development which covers the broad spectrum and involves very diverse interests: government, large oil companies, large international supply and service companies, and many smaller local companies.

We are very fortunate to have with us today three distinguished speakers who are experienced in these matters. First, Mr. Ashton R. O'Dwyer, Jr. is from New Orleans, Louisiana, a partner in the law firm of Lemle, Kelleher, Kolmeyer & Matthews. He is a member of the Maritime Law Association of the United States, and a resident member of the Association of Average Adjusters of the United States.

Second, Mr. Barrie Harper is a Scot, born in Glasgow and now a resident of Aberdeen. He holds a Master's Degree in Economics with First Class Distinction, a Law Degree from Aberdeen University, and is a chartered accountant. Moreover, he holds a diploma in Management Studies and is a Fellow at the Institute of Petroleum. Barrie started his own law and chartered accountancy firm, and he is now a senior partner. He acts as a financial and legal consultant to oil companies and oil service companies; is a Senior Lecturer in law and taxation at the Business Management School in Aberdeen. Finally, he is chairman and principal shareholder of a consortium of 14 service companies.

Third, Mr. Richard Spellacy is a major shareholder in Crosbie Offshore Services, Limited, which is based in St. John's, Newfoundland. He was born in the U.K., immigrated to Australia in 1945, went to sea in 1959, obtained a Master's Certificate in 1968, and by 1968 he entered the offshore business. He started his own business in London in 1976, and then opened Crosbie Offshore in St. John's in 1979.

Ashton O'Dwyer will speak first.

ASHTON O'DWYER: Thank you very much, John. I wish to begin my presentation today with a disclaimer. My law firm in New Orleans represents the interests of Ocean Drilling and Exploration Company in connection with the unfortunate catastrophe involving the rig Ocean Ranger. As you know, it is a very serious matter involving multiple lives lost. It is in litigation presently, therefore it is fitting for me to state that any similarity between that case and anything that we discuss today is purely coincidental.

I also wish to disclaim any expertise in Canadian law, because that is not my bailiwick and I do not hold myself out to be an expert in that field.

In order to illustrate a typical drilling operation in the Gulf, I thought it would be helpful to enumerate for you the various service companies involved in drilling an oil well, and in servicing the drilling rig.

The first step for our purposes is the selection of the drilling site. The location, on which the well is to be drilled, is selected by the oil company (also referred to in the industry as the operating company), based upon geological studies, sometimes made years in advance of moving the rig on location, as well as economic and legal facts. The oil company must consider the price of oil, the political climate in the country where one wishes to drill, and the tax consequences of drilling and producing in a particular locale. The oil company will necessarily obtain leases granting it the right to drill for oil and gas, and it must contract with a drilling contractor and the other necessary service companies available to work in the leased area. The oil company must comply with local as well as national law, but in the Gulf of Mexico, a unique body of law, which has evolved from the offshore oil industry, is well known to those advising the companies.

The drilling company provides the equipment, tools, and crew necessary to drill the hole at the selected site. In selecting the drilling contractor, the operating company may solicit bids for the work to be done and select the driller on the basis of those bids. Since January of this year, as the rig count in Louisiana has dropped significantly, oil companies are sometimes requesting bids on an entire package, thus placing the onus on the driller to contract with the service companies. Previously, service companies had been hired by the oil companies.

Since the first of the year, the rig count in Louisiana has dropped from 501 to 312 as of June 11, 1982. Yes, 1982 is being touted as "one for the record books."

Although the hiring of the "drilling unit," as the offshore rigs are more profitably known, is technically a time charter, the vessel is simply another piece of equipment furnished by the drilling contractor in order to comply with the provisions of the contract. You will not see a document entitled "time charter" or "charter party" or "operating agreement" when you analyze the relationship between oil company and drilling contractor. You are, however, going to see a drilling contract. In the schedule attached to the drilling contract, which lists the various pieces of equipment to be supplied by the contractor, you will see as an item of equipment: one drill ship, or one self-elevating jack-up unit, or one semi-submersible drilling barge and its equipment, crew, etc.

There are various types of offshore drilling units in the industry today. These include drill ships, submersible barges, jack-up barges, also known as self-elevating drilling units, and semi-submersibles. In the Gulf, we mostly see jack-ups, or what

refer to as drill barges, the familiar DB's that you will see as the identifying characteristic before the name of the vessel. These are to be distinguished from fixed platforms, which are permanently attached to the sub-soil and seabed on the shelf or elsewhere. In the States, we call these platforms artificial islands, and the unique body of law that was applicable to them is found in the Outer-Continental Shelf Lands Act.

The artificial islands have been judicially determined to be extensions of states adjacent to the locales, even though the artificial islands may be outside the territorial limits of that state. The state's boundaries are fictionalized and extended for these artificial islands located on the shelf.

There are various types of jack-ups, but two that you may be familiar with are the famous Bethlehem jack-ups, which are generally rectangular and have three legs with a hell-port mounted forward, and the triangular jack-ups. Both of them have key-way slots or notches in their stern end. Over that key-way, mounted on skids, is a huge derrick that can be positioned in almost any direction to drill the hole.

Jack-ups suitable for the shallow waters of the Gulf of Mexico, adjacent to the Coast of Louisiana, may not be suitable for the deep waters of the Atlantic Ocean off the Coast of Nova Scotia. I understand, however, that there is at least one jack-up off Sable Island. A typical rig for your deep waters would be a semi-submersible, one which has pontoons or columns which afford flotation to the rig. While the rig is being transported to the drilling site, the pontoons may be empty and the rig floats above the water. Although such rigs may be self-propelled, they are usually towed to the drilling site by a towing company which may be hired by either the oil company or the drilling contractor -- there is no hard and fast rule there.

Once the rigs reach location, the pontoons or columns are partially filled with water so that the rig remains partially afloat but not actually touching the seabed -- essentially in a state of suspended animation. In order to position such a rig correctly, and to keep it in position during the operation, anchor handling vessels and crews must also be hired either by the oil company or the drilling contractor. After the rig has been towed to the site, the pontoons are flooded and the anchors set; the drilling company is beginning to set up drilling operations.

So we have already identified several actors, the oil company, the drilling contractor, the tower, and the anchor handlers. These are just a few of the actors directly involved in mobilizing and getting an offshore drilling unit to its location.

One issue, which has been much litigated in the courts of Canada, England, and the United States is whether and under what circumstances a drilling rig might constitute a vessel, thus conferring Admiralty jurisdiction upon claims involving such vessels. Although the ultimate decision as to whether a structure constitutes a vessel rests upon the facts of each case, U.S. jurisprudence is consistent in holding drilling rigs

capable of floating on water as vessels; and thus incidents involving them fall within the jurisdiction of the Admiralty courts.

The leading case in the United States on this question is Offshore Co. v. Robison, 266 F.2d 769, out of the 5th Circuit. It was found that a Jack-up rig was a special purpose structure which, nonetheless, qualified as a vessel. Consequently, a roustabout who was permanently assigned to the Jack-up as a member of the crew was a seaman under the Jones Act, and thus entitled to maintenance and cure as well as to pecuniary damages for the negligence of his employer and the unseaworthiness of the vessel. In accord, there is another 5th Circuit case wherein the court affirmed several earlier decisions, specifically holding that a semi-submersible was a vessel for purposes of jurisdiction under the Jones Act and the general maritime law.

I do not know whether you are familiar with the court system in the United States, but most Admiralty matters are litigated in the Federal Courts. Each State is divided into Districts. The Federal Court is the court of original jurisdiction in Admiralty matters. The Appellate Court, or the Court of Appeals, is classified by Circuit numbers. The 5th is formally comprised of the States of Texas, Louisiana, Mississippi, Alabama, and Florida. It has been the leader in the United States in Admiralty matters involving the offshore oil industry. It recently, however, underwent a split because the various other legal matters which it had to decide were consuming so much of its docket that the Judges were overworked. It now is split into two Circuits, the 5th and the 11th, with Texas and Louisiana remaining in the 5th Circuit.

I thought that you might be interested in a few cases that I feel are a little bizarre, but are, nonetheless, on the books. Under our system, they are precedent, at least if you are litigating in the particular district or circuit court from which they emerged.

A recent Texas District Court case, which is now on Appeal to the 5th Circuit, is Bargar v. Petroleum Helicopters, Inc., 514 F. Supp. 1199, decided by Judge Fisher, of the United States District Court for the Eastern District of Texas. He held that a helicopter equipped with pontoons was a vessel within the meaning of the Jones Act and general maritime law, so that the services of the pilot who was killed in a crash over water could sue the helicopter company under the Jones Act and general maritime law.

Judge Fisher reasoned that a helicopter, which was constructed for the purpose of transporting men and materials across the navigable waters of the Gulf of Mexico, specifically designed for take-offs, landings, and movement on water, was a vessel. He further reasoned that the helicopter company engaged almost exclusively in the business of transporting personnel to and from offshore platforms and was therefore engaged in a traditional maritime activity -- the helicopter, being the functional equivalent of a crew boat.

In accord with Judge Fisher's decision is another 5th Circuit case, which held that a helicopter being used to ferry personnel and equipment to and from an offshore rig bore a significant relationship to a traditional maritime activity, therefore, claims for damages arising out of a crash at sea while the helicopter was being used to ferry supplies and personnel to and from drilling structures offshore fell within the jurisdiction of the Admiralty.

You should know that in the United States, some connection with "traditional maritime activity" is necessary to the conferring of Admiralty jurisdiction as is the necessity that the tort actually occur upon navigable waters. As a result, we have a two-pronged prerequisite to Admiralty jurisdiction.

In Executive Jet Aviation, Inc., v. The City of Cleveland, Ohio, 1973 AMC 1(1972), for instance, claims arising out of the crash of a commercial airliner on Lake Erie, navigable waters, were held to fall outside Admiralty jurisdiction since neither the flight nor the crash bore a substantial relationship with traditional maritime activity, even though occurring upon navigable waters.

I stated that I disagreed with the decisions holding that a helicopter with pontoons is a vessel. And, to tell a war story, which most lawyers have a lot of fun doing, particularly when you've won, I will tell one.

I recently successfully tried a case for a geophysical company, and this was a non-jury case decided by a Federal District Judge in New Orleans. He held that a marsh buggy, which is a track amphibian that looks much like a tank and is constructed and designed to float on water and actually does so, was not a vessel. Therefore, its driver was not a seaman, even though the marsh buggy had the capability of navigating small lakes, canals, and streams.

That case was Perle v. Western Geophysical Company of America, 528 F. Supp. 227. Those are the people that go through the marshes and offshore with geophysical equipment, setting charges, dynamiting, and then taking surveys.

How does this relate to what you people do and what your law is? I will remind you of my disclaimer, but I am going to cite a learned authority on Canadian Admiralty law, Mr. Wylie Spicer, who has written in his fine article "Some Admiralty Law Issues in Canadian Offshore Oil and Gas Development," which was printed in Lloyd's Maritime and Commercial Law Quarterly in February of 1982. In that article, Mr. Spicer warned his readers that Canadian jurisprudence on the subject is inconclusive, even though U.S. and English law appears to be conclusive. Nevertheless, in a footnote to his article, Wylie points to a recent Canadian decision, The Queen v. Saint John Shipbuilding and Drydock Co., Limited (unreported, A-638-79), wherein the Federal Court of Appeal reviewed many decisions of the Canadian courts, and concluded that a barge fitted with a heavy crane, even though not capable of self-propulsion, was a ship. Mr. Spicer viewed this decision as indicative that the courts are moving toward the conclusion that a semi-submersible rig is indeed a ship under Canadian law.

Why worry about all this? What relevance does it have to offshore supply and service, and assigning charter parties? The effects of drilling rigs being classified as vessels are many, at least in the United States. These reasons include the jurisdictional question and applicable law, the remedies which are available to the parties as a result of these units being classified as vessels, and issues as respects limitations of liability.

You know that in the United States, we have a statute called the Jones Act which permits a seaman employed to sue his employer for damages in Admiralty and have his case tried before a jury. The word "damages" is significant because, unlike many jurisdictions, a Jones Act seaman's remedy against his employer is not limited to compensation benefits according to a fixed schedule. In fact, his recovery is whatever the jury sees fit to give him based upon the evidence that it has heard. Let me tell you that sometimes they give him the sun, the moon, and the stars. Reasonable men sometimes wonder how these juries reach such unreasonable results.

If one working aboard an offshore drilling unit is found to be a Jones Act seaman, and if this individual is injured due to negligence on the part of his employer, or the unseaworthiness of the vessel, then he has potential, at least, for recovering a very, very high award.

U.S. law is to the effect that a determination of whether the various service personnel may be classified as seamen falling within the perimeters of the Jones Act and the general maritime law depends largely upon their degree of attachment with vessels and the particular functions which they perform. If one is attached to a rig in more than a transitory way, and if his or her employment contributes to the rig's mission, operation, or welfare, then he or she may be subject to the protection of the Admiralty courts.

Some of you might be interested in the status of the proposed amendment to the Jones Act involving foreign seamen. This was not something that I had prepared for you today, and it has been several months since I last looked at the proposed amendment which was then in Mr. Biaggi's Committee in Washington, under review. As I recall, it will remove from the Jones Act jurisdiction claims by seamen and their survivors in the case of death, if the seamen are foreign nationals, injured or killed in foreign waters while working for foreign subsidiaries of companies owned by a U.S. parent. I urge any of you who have a particular interest in the status of this legislation to either talk to me after the presentation today or to write Mr. Biaggi in Washington.

Now let's talk about limitation for just a moment. Is a vessel a vessel for all purposes? Well, not necessarily. Yesterday, I learned that a judge in Houston, who is very scholarly and who wrote a very erudite opinion, did what I would call re-invent the wheel in holding that a semi-submersible is a vessel for purposes of the owners invoking the benefits of the Limitation of Liability Act. Had someone asked me last week

whether I thought there was any question about that, I would have unhesitatingly answered no. However, this judge went into a very long discourse on why it was. This was Judge O'Connor of the United States District Court, the Southern District of Texas -- a well respected jurist.

The Limitation of Liability Act in the United States applies to "every description of water craft or other artificial contrivance used or capable of being used as a means of transportation on water." That is a pretty broad definition. Judge O'Connor in The Matter of the Complaint of SEDCO, Inc., as owner of the mobile drilling unit SEDCO 135 -- which was the rig over the now infamous IXTOC #1 well off the Coast of Mexico, which blew out in 1979 -- decided that the semi was indeed a vessel for the purposes of the owners' invoking the provisions of the Limitation Act. In doing so, the judge did not hint what might occur when the owners' right to limitation is determined -- that being reserved for another day.

It might also interest you to know that the International Convention on Limitation of Liability for Maritime Claims, signed in London in 1976, may preclude Canadians' worrying about limitation if that particular Convention is adopted by Canada. Again, I would urge you to consult a learned Canadian jurist for how that might impact your operation.

I would always advise those who are negotiating and writing contracts to include in the contract a provision which states words to the effect of "it is hereby understood and agreed that the right to limitation of liability shall not be affected." I can quote one that I have used and seen in other places:

Nothing contained in this agreement shall be construed or held to deprive the owner of any right to claim limitation of liability provided by any applicable law, statute, or convention.

I shall now turn to the issue of who are the various service personnel, who contracts for their services, and how do they get to and from the job site? As a general rule, the oil company contracts with all the service companies except the marine crew of the drilling rig and the catering crew, both of which are usually hired by the drilling contractor. There are some exceptions to this rule, however. Besides the towing company and the anchor handler, transportation and supply companies must be hired. These include helicopters, crew boats, supply vessels, and standby vessels. I even understand that you have iceberg watch vessels here.

The oil company generally contracts with those service companies engaged in the more technical or specialized operations conducted on the rigs. These include casing, cementing, testing, logging, geological services, and personnel. At the commencement of operation, the drilling crew is responsible for drilling the surface holes.

I thought that it might be interesting for you to go through a little bit about a drilling operation. This task is

accomplished by running a string of drill pipe, one joint screwed into the other, with a drill bit attached right down into the seabed. The hole is then drilled to specified depth. Once the drill pipe is removed from the hole, the casing crew moves in. You have a hole in the ground and then you line it with casing. This is similar to drill pipe, but larger in diameter. It is placed in the hole to permanently line the hole. Behind that, a cementing crew comes in and fills the space between the hole and the casing with cement.

Normally, independent contractors are employed to perform both the casing and cementing functions. However, the drilling crew is normally available to assist in such operations. Once the casing is cemented in place, drilling operations are resumed. However, additional casing operations may be necessary as the drilling crew reaches greater depths. While the hole is being drilled, certain testing or logging crews and equipment may be necessary to monitor the various types of formations being passed through and to determine whether oil and gas might be present.

First, you may find mud logging personnel. The mud logger is to monitor down-hole operations, examine cuttings in the formations made by the drill bit and determine whether oil or gas is present.

In addition to mud logging, there may be electrical logging equipment and personnel on the rig. In electrical logging operations, various logging tools are lowered into the hole on strings and tests are conducted which allow electrical logging technicians to measure the properties of the formation as the hole is being drilled. Also present at this stage of the operation is a mud engineer, or mud man, whose duty it is to regulate the properties of the drilling fluid in the hole, mostly or usually an oil base product. The properties of these fluids may vary, depending upon the formations and the stages of drilling. It is the job of the mud man to insure that the mud has the necessary properties during each phase of the drilling operation. The mud man often works pursuant to a separate contract, with the contractor providing the drilling fluid products and engineering to the oil company.

It may interest you to know that our well has not yet reached production; but imagine a hole in the ground with a cavern at the bottom of the hole with oil and gas under great pressure seeking to escape. We have devices on oil wells, called blow-out preventers, high drills, and Christmas trees that keep oil and gas from coming out of the top of the hole.

Mud, particularly in a workover operation, is also very, very important. You can imagine a tube several thousand feet long, or deep, with pressure being exerted at the bottom of the tube or hole by all of this mud or fluid. It is this weight material, or mud, that often keeps the oil and gas from just coming straight through to the surface.

Once the hole has been drilled to its specified depth and production is desired, personnel are necessary to complete the well. This includes gravel packing and perforating into the pay

zone. Perforating is just what it sounds like. You put a charge on the end of a tool and you explode it and it punches little holes in the pipe down there in the bottom of the hole, and your production material then enters your string. This operation is normally conducted by specialists pursuant to contracts entered with the oil company. At this time, one would also find down-hole production testing personnel present on the rig whose job it is to measure the flow of oil and gas coming out of the well.

Also available at various stages of the operation are surveyors, weather forecasters, and diving personnel. Weather forecasting services may be necessary to offshore rigs in areas where peculiar weather conditions may arise. In operations in the Gulf of Mexico, such weather forecasting services might monitor atmospheric conditions and wind and wave actions. Up here, it might require iceberg watchers.

Diving personnel may be hired to make any seabed surveys or bottom inspections, both before and after the rig moves on location.

As you know, the Northwest Atlantic is famous for its ship wrecks. I am sure that the charts that are used by the companies out here are covered with the locations of known wreck sites. I am equally sure that there are many other sites that are unknown.

Before you move a 25 to 50 million dollar jack-up rig on location, you want to make sure that you are not going to set it on top of one of these ancient wrecks. So, you have survey parties and divers who perform bottom inspections to make sure the area is clean. This gives an overall view. Let us now move backwards and begin to speak in more detail of specific contracts.

Once it has been determined what service personnel are necessary for each phase of operations, the oil company and/or sub-contractors must enter into separate service contracts with various support companies. A preliminary consideration in drafting all such contracts is a determination of the law applicable to the drilling operations in general and to any contracts which may be entered into. This includes determining what law is applicable, be it national law, the law of a particular country, or the law of a certain state within the country. The terms of the contract must then be drawn so that they comply with applicable law.

Laws which should be analyzed in order to determine the necessary contractual provisions may include laws relating to equal employment opportunities, workmen's compensation benefits, indemnity agreements, pollution control, and limitations on the number of expatriate personnel and/or contractors, if the operations are to take place in a foreign country.

After the research has been completed on the laws applicable to each contract, the terms of the contract must be drafted. Generally, each contract serves to identify the parties involved and the service and equipment to be provided by each. It also sets forth the obligations and responsibilities

of the respective parties and identifies the term or length of the contract.

The parties to the contract, we have seen, will generally be the oil company and the sub-contracting service personnel or, in the case of the catering or towage contracts, the drilling contractor and the service personnel. The personnel, equipment, and services which are to be provided may be enumerated in the contract itself, or they may be identified in attachments, separate agreements, or even oral agreements which modify the written contract. The drilling contract, for example, generally provides that a number of specialized crews will be furnished to man and operate the drilling vessels, as well as what equipment the driller is to furnish, for example, the vessel, the draw works, rotary table, air compressors, pumps, mud tanks, cranes, drill collars, drill pipes, blow-out preventers, etc. All of these items are generally specifically enumerated, so that if you get to location, and you begin a drilling operation and something is missing, you know who is liable.

Just to give you an example of the detail that has gone into preparing a drilling contract, it even goes down to something that I consider to be an expendable item, slips. These are the things that hold the pipes up to keep it from falling down into the hole as the next stand, or joint, of pipe is being moved from the pipe rack or racking fingers to be screwed on to the one end of the hole. The slips keep the last joint that you have screwed to the next to the last joint from falling right down into the bottom of the hole. That is an expendable item and they are not very expensive. Yet, here it is, item number 39 in this drilling contract. That's pretty specific!

The general obligations and responsibilities of each of the parties are normally laid out in a master service contract or agreement between the oil company and the service companies. Master service contracts normally extend for a specified period of time, June 1, 1982 to June 1, 1983, and are renewable at the option of the parties. They are usually not turnkey type contracts, terminating upon completion of a specified task. The contractor's obligations, as opposed to the company's obligations, are numerous and are detailed in several provisions which are common to nearly all master service contracts. Firstly, the contractor normally agrees to comply with any and all applicable law, and certain attachments may be made to the master agreement which certify the contractor's compliance with applicable legal provisions.

Secondly, the contractor normally warrants to perform the work in a safe, proper and workmanlike manner, and to provide material and equipment of good quality, free of defects. Further, each master service contract normally contains risk allocation, indemnity, hold-harmless, or insuring clauses, which detail the obligations of the contractor and/or the company and their underwriters, to indemnify the other for injury to, death of, and/or loss of or damage to equipment.

Indemnity agreements in master service contracts have spawned a great deal of litigation in the United States, and if I were a betting man I would bet that it is going to provide the lawyers in the audience with a great deal of business. By indemnity agreements, I mean those agreements by the terms of which one party agrees to indemnify the other even for the consequences of that other party's own negligence.

In the United States, although talismanic words are not required, the intention to indemnify one, even for the consequences of his own negligence, must be spelled out in clear and unmistakable terms in the contract. You cannot say: "Ashton O'Dwyer agrees to hold harmless, defend and indemnify John Murphy of and from any and all liability arising out of the agreement between the parties." You must specifically say: "Ashton O'Dwyer agrees to hold harmless, defend and indemnify John Murphy of and from any and all liability arising out of the contract between the parties, including liability resulting from the sole, joint, or concurrent negligence of the parties and including particularly Mr. Murphy's negligence."

Although one might find disagreement in some corners, the identification of indemnitor v. indemnitee is generally a function of the market place -- supply and demand. It was widely held a few years ago when drilling contractors and rigs were in great demand, that the drillers could impose conditions upon oil companies which you just would not find in today's market. The Gulf Region has seen certain drillers go under recently, a phenomenon which was previously unknown.

On the other hand, there have been those who challenged the indemnitee's position, that is, the person who is being indemnified, depending upon whose ox is being gored, with charges of violation of public policy or contract of adhesion. A contract of adhesion, as we call it in the States, is one in which there is unequal bargaining power between the parties, such that the party wielding the most power may force the less powerful party to accept certain contractual provisions that inure solely to the benefit of the other party.

In determining the validity of the release from negligence clauses and towage cases, the Supreme Court of the United States in Bisso v. Inland Waterways Corporation, 1955 AMC 899(1955), which I will discuss later, held that such clauses would generally not be enforceable because they did not encourage the negligent party to pay the price of his negligence. They let him off the hook. Because the clauses were often incorporated into a contract of adhesion, the argument often put forth by service companies is that they are not in a position to bargain with large oil companies and must generally accept whatever terms the oil company proposes.

Thus, most indemnity agreements in master service contracts do favor the oil companies. That is a fact of life, ladies and gentlemen. They also require the service companies to bear the risk of most losses regardless of fault. Whether or not you call it negotiated contracting between legal persons of equal bargaining power, the result is that the contractors usually

bear the burden of indemnifying the oil companies for personal injury, death, or loss of or physical damage to property, which may occur as a result of the contractor's operations, whether or not such damage is occasioned by the fault or neglect of the Indemnitee.

I do not want to create the impression that I am painting a picture of an oil company wearing a black hat. As we all know, they do not always wear black hats. Many of us depend upon the oil companies for our very livelihood. Where would we be without them? In fairness, there are -- and I will discuss this a bit later -- other forms of indemnity.

We know, for instance, that contracts of indemnity or Indemnitee's obligations, can be insured. If your only exposure as a result of signing a contract with an indemnity provision in it is an increase in your insurance premium, then you can use that insurance premium for setting your rates. You always want to remain competitive, but certainly it is something that can be passed on to your customer, and the customer in many cases is the oil companies.

Additionally, in fairness to the oil companies, you will see a lot of risk allocation in contracts. You take care of your people, I will take care of my people. You take care of the above hole operation; if anything happens down hole, it is my responsibility. There are various ways to spread the risks and I did not want anyone to get the mis-impression that I was putting a black hat on anyone. I was just stating economic reality.

Legislation in Texas and Louisiana forbids oil companies engaged in offshore drilling operations from procuring indemnity agreements or agreements by which one seeks to escape the consequences of his own fault or neglect. Is this good for lawyers or bad for lawyers? Our statute was passed only last year, and we are gleefully awaiting the opportunity to test its constitutionality and its various provisions in court.

The Texas statute pertains to property damage, as well as personal injury and death, whereas the Louisiana statute prohibits such agreements only with regard to the latter. Therefore, you can still agree to indemnify people in Louisiana for property damage, but the statute on its face prohibits it with respect to personal injury and death. The practical impact of these two statutes on contractual relationships, indemnification agreements and drilling contracts, and related agreements has yet to be tested, as both are relatively recent. Neither has been subjected to any real judicial interpretation to date.

Both statutes are similar in language and in purpose and they both declare generally that indemnity agreements in drilling and service contracts, which require indemnification for losses attributable to the fault or neglect of the Indemnitee, are null and void as against public policy. They discourage the wrongdoer from taking steps to alleviate the consequences of his negligence, and they are the result of negotiations between people of unequal bargaining power.

Both acts are very broad in that they apply not only to drilling contracts, but to any agreements which have anything whatever to do with operations involving the drilling of solid, liquid, or gaseous minerals. Both of them are similar in that they exempt indemnity provisions concerning bodily injury and death due to radioactivity. There is a radioactive material on drilling rigs; it is used down in the hole, or used in the performance of services to control a wild well, which is one of the risks of the venture.

The Texas statute also exempts indemnity provisions pertaining to property damage resulting from pollution, or from reservoir or underground damage. Thus, the major rationale between two Statutes is the same, that is, to make void, as contrary to public policy, any agreement which would require one party to indemnify the other for losses occasioned by the sole or concurrent negligence of the indemnitee. I am reporting this to you as a fact. I am not espousing one view or the other as good or bad.

The way cases have been decided recently, unless the types of liability or faults are spelled out in the contracts, the courts are not going to enforce the harsh provisions of the Indemnity Statute against the indemnitor. Needless to say, the Louisiana Anti-Indemnity Statute was heavily lobbied for by the service companies, not the oil companies.

The reason no lobbying effort in Louisiana was put forward by the oil companies in this session of the legislature was because the oil companies were more involved in what we call the CWEL legislation, which was recently defeated in Louisiana. This was a proposal by Governor Treen to tax the oil industry. CWEL stood for Coastal Wetlands Environmental Levy. It boiled down to a tax on mineral resources. The oil companies came out in force and defeated the measure. Next summer the oil companies may marshal their forces against the Louisiana Anti-Indemnity Statute.

It may be interesting to trace the history of indemnity provisions in a towage contract setting. A landmark decision is Bisso, cited previously, wherein the Supreme Court held that release and hold-harmless clauses in towage contracts, which released the towing company from liability for negligence, were invalid and unenforceable as contrary to public policy. The court thus applied to towage contracts what it had announced is the general rule long recognized by the courts, i.e., that release from negligence clauses were invalid and unenforceable for two reasons: 1) negligence must be discouraged by making the wrongdoer pay damages; and 2) those in need of goods and services must not be overreached by others who have the power to drive hard bargains. Thus, the Bisso Rule established in towage contracts a rule similar to the effect of the Texas and Louisiana Anti-Indemnity Statutes.

The Supreme Court has been steadfast in upholding the Bisso Rule. The Fifth Circuit has, however, held the Bisso Rule invalid where the second prong of the Bisso rationale was absent, i.e., where the indemnitee was not in a position to

exert undue pressure on the indemnitor during contract negotiations. If they are not of unequal bargaining power, the Court will enforce the contract. The Supreme Court, however, reversed the finding of the Fifth Circuit's ruling as being in direct contradiction to its holding in Bisso.

As a result of the firm stance taken by the Supreme Court, the industry has developed other means to provide for release from negligence or indemnification of the tower in towage contracts. The most popular method is to draft a contract which requires the tower to be named as additional assured in the hull and P & I policies issued to tow; and that the underwriters of the tow waive subrogation against the tug, its owner, and operator. In the States, we call this naming and waiving. The legality of such an arrangement has been upheld by the Fifth Circuit.

In the Gulf of Mexico, the liability form most often seen in insurance contracts is Form SP23 revised 1/56. The hull form most often seen is the American Institute Hull Clauses Form, June 2, 1977. Additional assurances and waivers of subrogation are added to or deleted from the policies by endorsement. The requirement that owners of service vessels such as tugs, supply boats, and other ancillary craft should be enrolled in P & I clubs is practically unheard of in the Gulf region, although I understand that it is common in this part of the world. In the P & I club context, additional assurances and waivers of subrogation are, of course, dealt with in the applicable terms of entry or in club circulars, which generally require mutual indemnification agreements, by which the contractor takes care of his people and the property, and the company takes care of its people and property.

I recently had the pleasure of winning a case in which I represented a supply boat company. The anchor of the supply boat allegedly pulled up a pipeline running between platforms in the Gulf. We were hired by a drilling contractor to supply a drilling rig owned by Union Oil Company of California and the charter party between the driller and my client, provided that Union would be named and waived in the P & I policy on the tug. As soon as we were sued by the owner of the pipeline, Union, who was also sued, called upon my client to agree to indemnify it in accordance with the terms of the policy in which it had been named as an additional assured. This was the P & I policy on the supply boat.

I denied that my client pulled up the pipeline. We litigated, and the two defendants cross-claimed against each other. The court agreed that the pipeline owner did not bear his burden of proving that our anchor in fact damaged this pipeline. The Fifth Circuit Court of Appeals affirmed the District Court opinion but remanded the case to the District Court for a determination of whether or not, notwithstanding the victory, I owed attorney fees and costs to the lawyer hired by Union. That case is under submission right now.

The position that I took is that the P & I policy, particularly the SP23 form, insures one "as owner as the vessel

named herein." My position is that, first of all, my client had no liability as owner of the vessel and therefore there is nothing for which to indemnify Union. The claims made by the pipeline owner against Union included failing to warn the vessel owner of the presence of a submerged pipeline, permitting the supply boat to anchor in plain view of the people who were working on the rig. Moreover, Union failed to install a mooring buoy for the supply boat at the rig location which would have alleviated the necessity for dropping anchor. I submit to you that this is a claim of liability, other than as vessel owner, and one which my client has no responsibility for.

In the risk allocation scenario I would refer you to Michael Summerskill's book, Oil Rigs, Law and Insurance, which is a very learned treatise on the subject. In his book, Mr. Summerskill notes, for example, that in the case of a blow-out, unless the terms of the contract provide otherwise, the risk falls upon the oil company because of the money involved. So we have seen three ways to indemnify: 1) specific indemnity agreements, 2) insurance provisions, and finally, 3) allocation of risk provisions. Those should be considered by drafters and reviewers of contracts.

The last problem that we will talk about involves interpreting the contracts and what law we use to interpret them. The resolution of the indemnity question often turns not only on the language in the contract but also on the typed contract in question. The applicability of one law over that of another. Courts have generally held, except in unique circumstances, that the validity of indemnity clauses in maritime contracts is to be governed by maritime law. Under maritime law, indemnity provisions are generally upheld as valid. If this is the case, then indemnity provisions in maritime contracts may be upheld notwithstanding the Texas and Louisiana Anti-Indemnity Statutes provided that Bisso was found to be inapplicable. The question is, then, what constitutes a maritime contract?

Several contracts relating to offshore drilling operations have been found to be maritime. In Iranscontinental Gas Pipeline Corp. v. Mobile Drilling Barge, "Mr. Charlie," a drilling contract governing drilling operations in the Gulf, was found to be a maritime contract, and thus governed by maritime law. A contract to furnish, man, and maintain the vessel to be used in servicing oil wells was similarly found to be a maritime contract. Thus, admiralty law governs where it is in conflict with state statutes. However, the Supreme Court has held while maritime law governed maritime insurance contracts generally, state law would govern interpretation and validity of those contracts in the absence of any contrary Federal law. This, of course, is confusing. Those who draft contracts in the offshore oil industry should know that parties to contract are free, within certain limits, to choose their own governing law and have the same enforced by a court, provided either the parties or the contract has some connection with the forum state. Moreover, the application of the stipulated law should not violate strong policy considerations.

Like the Federal courts, Louisiana state courts have likewise recognized that the stipulation of applicable law should govern the interpretation of a contract, absent strong policy considerations.

What other obligations should those advising service companies be aware of? Workmen's Compensation and Employer's Liability Insurance provisions are two obligations. Comprehensive general liability insurance provisions, including insurance covering contractual liability for the obligations assumed in the contract, are important as well. Comprehensive automobile liability insurance, hull and machinery insurance, protection and indemnity insurance, aircraft liability insurance, all must be considered. Generally, the insurance requirements are laid out in attachment to the master service contract, which requires delivery of certificates. Contractors have the obligation of acquiring and maintaining necessary licensing and permits. Assignment clauses, arbitration clauses, contractor's obligation clauses must all be considered. Thus, it can be plainly seen that the development of any offshore oil or gas well entails the services of numerous companies.

The service companies are generally responsible directly to the oil companies, and are generally responsible for seeing to master service contracts. The types of services which must be provided, and the personnel and equipment necessary to provide such services, depend upon the expertise of the service company and the stage of the operation, in general. Although most of us would prefer not to admit it, although rates may be negotiable, the terms of the master service contract which service companies are called upon by oil companies to sign are not generally negotiable. As the insurance manager of one of my firm's clients told me, "if you've seen one, you seen them all." I hope that this presentation has illustrated some of the basic responsibilities and obligations of the respective parties. Thank you.

BARRIE HARPER: I am going to try and tell you some of the aspects to look at in the oil related contracts, which you might pay some attention to if you are advising clients. I think that you saw from what Ashton said this morning that unless you know what the terminology is about, you are dead. I would strongly advise you to get a glossary of terms of the oil industry if you do not already have a copy. You have got to know what you are talking about. To that end, get information from oil companies' publicity departments and from the oil companies themselves.

I recommend British Petroleum as being very helpful. I understand now how they are set up here, because we have had some dealing with them in St. John's, Newfoundland.

I strongly advocate that you know the basics as, firstly, you must be able to advise your clients properly and you must know the terminology. Secondly, the oil company lawyers may get exasperated trying to explain the terms to you and may try and take advantage of you.

In my experience, the majority of the oil companies are conservative. Therefore, they prefer to try and use tried and tested equipment and supplies rather than new ones where something may go wrong. They are prepared to pay more money for something that they know is going to work well. Therefore, a general outlying knowledge of how the industry works is essential. If your client is trying to persuade oil companies to use his product rather than the tried and tested ones.

On the obverse side, however, oil companies have a policy of encouraging local industry. They want to appear to be friendly in the local area, particularly on the service side. If you can demonstrate a certain basic knowledge on the service side, then from an oil company's point of view your stock is going to rise and your client's stock is going to rise. In the northeast of Scotland, for example, some law firms have been completely bypassed by the oil industry, as these firms have made no attempt whatsoever to understand the industry. To this end, if you do get a chance to visit oil platforms and support vessels, I think you should do so. I think there is nothing like actually going out there to see it. In the North Sea, we do not normally have breaking vessels. We have three types of vessels. Firstly, supply vessels. These deliver supplies ranging from bulk quantities of food and water for personnel, to mud and cement for drilling, which are essential to the ongoing operations on platforms. To cope with the daily demand for a broad range of vital services, offshore supply vessels commute between the ports and the rigs.

The main requirement of a supply vessel is a powerful bow or stern thrust and variable pitched propellers which ensure a high degree of maneuverability when the vessel gets alongside the platform. Normal supply vessels are roughly up to 260 feet long with a cargo-carrying capacity of about 1,400 tons on clear deck areas measuring at least 135 feet by 35 feet. That is about a carrying capacity of 9,000 to 12,000 cubic feet. Supplies are usually in special containers, and, at the moment, we are just using single containers. I have visions of multiples of six going alongside of the rigs. They are transferred to the installation by the platform's crane. Some of the more versatile vessels are also equipped for towing and anchor handling operations to broaden the scope of their functions when in an offshore location. Secondly, we use standby safety vessels. These are 24 hours a day, 7 days a week, stand-by safety vessels. They circle the exploration rigs, the platform or groups of platforms. These specialist vessels provide emergency rescue support in the event of an evacuation offshore, and fast recovery should a person fall overboard. The vessels in our case, that's from Aberdeen and Lerwick, are custom converted trawlers, which were selected for their known ability to operate even in the worst of North Sea weather conditions. They are out there all the time. All must carry one or more rescue craft capable of being launched in seconds. The vessels are subject to Department of Trade and industry regulations. They must be capable of accommodating on

a short-term basis all personnel stationed on the platform. They are also equipped to give first aid to rescued personnel.

Thirdly, and coming in just now, are specialist support vessels, multi-functional service vessels -- MSV's. They can perform a broad range of tasks, including diving support for underwater construction and maintenance, and comprehensive emergency support in such situations as fire, blow-out and emergency evacuation. Seaforth Maritime, for example, a company based in Aberdeen, is having one constructed that can take six winged aircraft like an aircraft carrier.

These are the main types of vessels that we use and sometimes they are capable of using remote control vehicles which operate instead of divers. We are now seeing a big trend toward remote controlled vehicles. These are just like television cameras. You have to arrange that your pilot on the boat and the pilot flying the RCV know what they are doing. In fact there is a shortage of these RCV's in the world. Most of them come from San Diego, California.

To give you some sort of figures as to how these vessels are used, and I've got clearance from one of the companies to say so, in one of Shell's fields alone, we have had 50 vessels operating at once. We had more than 22,000 air movements. To place this in context, this is only 4,000 movements less than the average flight movements in Heathrow during one month. We had 2,623 people moved in the first week of last month, and we employed a fleet of 15 helicopters, 5 fixed wing aircraft and 10 supply handling boats. The money involved in the one field at the moment is at least 3.6 billion pounds. That will give you some idea of what you are going into, if oil is discovered in your offshore.

The next problem is what do you do, or how does your client get the first contract? In these circumstances, I advocate caution. I have been in situations similar to your own, where a local entrepreneur has been given a chance at his first contract with a major oil company, and you are to advise him legally. Your client usually comes bounding into your office, without an appointment, and says, throwing down a draft on your desk, "What do you think of that?" Having glanced at the main clauses, you suggest that he refuse to have anything to do with the contract in its present form. Two things might then happen. First, you might immediately lose a client. And secondly, and hopefully, he might ask why. If that happens, then you have to explain the significance of certain terms and conditions.

As Ashton O'Dayer said this morning, as a general rule, most oil company contracts, when they are originally drafted, are in the oil company's benefit. I think the reason for that is fairly obvious; first, the oil company pays its in-house lawyer or legal consultant to produce the contract, and secondly, if a third party is injured or there is an action for damages, he often tries to bring in the oil company as co-defender as well as your client, knowing that the oil company has vast resources compared with your client.

You are expected, as advisors to the client, to take the draft contract, as a standard form contract, and adapt it to meet the main needs of your client. One thing I would ask you to remember: it is not the job of the oil company or legal consultant to indicate what areas you should pay particular attention to. So, be very careful when you go through a draft contract. I am going to indicate two areas in particular which call for attention: firstly, off-hire clauses, and secondly, premature ending of the charter party.

Off-hire Clauses. The off-hire clause is an exception to the charterer's obligation to pay hire throughout the charter period. The charterer must show that the off-hire clause applies. There are various problems. The first one is the clause may be triggered by events which should not be attached to the owner's fault. It may apply even when exclusion clauses relieve parties of the obligations. Because it is triggered by events, these need careful definition, hence you must define what the events are. They may be accidents, repairs, breakdowns, collisions, groundings or deficiencies in crews.

The oil companies have the right, if they do not like the look of a particular worker, to let him off the rig, no reasons given. In practice, they do not give you reasons. They just do not like him.

If the event is caused by a breach of the charter by the charterers, the charterers cannot claim off-hire when they themselves are in breach of contract. Secondly, the typical off-hire clause does not easily cope with an intermediate situation. Either hire is payable or it is not. If there was a partial breakdown or deficiency, we found it essential to provide for a proportionate amount of hire. The amount, if need be, can be fixed by arbitration.

I would also suggest you do not have arbitration fixed in London, because sometimes it can be pretty horrendous. I understand that other places can be worse, but the worst we have had has been in London.

Thirdly, charterers who claim off-hire may withhold the off-hire claim against future hire payments and thereby improve their cash flow. This is a constant source of aggravation. Many oil companies, as you know, have a lot of financial muscle. They can use this money. They have treasurers and treasury managers. They utilize this money to the maximum, so, again, make provision for it.

Fourthly, on the other hand, charterers do not always win. Just because a vessel is off-hire does not mean suspension of the charterer's obligations. The charterer may have to continue to pay for fuel, harbor dues and services.

Fifthly, the resumption of hire creates two problems: (a) Is the vessel fully efficient again, and who decides that? And (b) what happens to the time lost? For example, if a vessel is hired for 12 months and it is off-hire for 3 months, does the hire end at the termination of the original 12 months or after 15 months? The answer depends on the contract.

Premature Ending of the Charter Party. Premature ending of the charter party can arise from frustration, rights under the contract or rescission for material breach.

Firstly, frustration, or, as we call it, commercial divorce for parties. As a preliminary point, it should be noted that the common use of the term force majeure, at least in the U.K., and I think, the rest of Europe, is uncertain, despite having been adopted from the Code Napoleon.

Frustration can arise from the acts of the parties. It is very difficult in law to say that mere delay or increasing expense is frustration. Other frustrating events may arise as a result of the fault of one of the parties. What is the effect of fault on frustration? The law in my view is obscure, but one thing that is clear is that a party cannot by intentional act produce frustration.

In referring to Taylor v. Caldwell (1863) 122 E.R. 309, Lord Stenderdale observed: "I do not think any authority has ever gone so far as to decide that if the defendant has burned down the music hall himself, he would have been entitled to say the subject matter was gone and the contract was frustrated." This dictum was followed in Mertens v. Home Freeholds Company, Limited [1921] 2 K.B. 526 and approved in Joseph Constantine Steamship Line Limited v. Imperial Smelting Corporation [1942] A.C. 154 (H.L.), per Viscount Simon, L.C.

Self-induced frustration is not a bar to the enforcement of the contract. That was followed in Joseph Constantine Steamship Line Limited v. Imperial Smelting Corporation and Maritime National Fish Limited v. Ocean Trawlers Limited (1935) A.C. 524 (P.C.).

For this reason, we must treat with caution recent dicta which state that whether an employer dismisses an employee is a factor indicating frustration of the contract of employment, as in Hart v. A.R. Marshall and Sons [1978] 2 All E.R. 413.

In the case where the supervening event is caused by the party's negligence, there are dicta indicating that it is not a bar to pleading frustration.

The issue was raised but not decided in Joseph Constantine Steamship Line Limited v. M.P. Smelting Corporation Limited, where there are dicta indicating that negligent acts are not the degree of fault which bars the contractor from relying on frustration.

Viscount Simon was concerned with a problem of a prima donna who lost her voice as a result of carelessly not changing her wet clothes after being out in the rain. Lord Russell pictured her sitting in a draft. Lord Denning, the eminent lawyer, has taken Lord Russell's obiter dicta to mean that there is frustration of the prima donna's contract. This is followed in Hare v. Murphy Brothers Limited [1947] All E.R. 940 (C.A.).

In a Scottish case, the Second Division decided that the negligent grounding of a ship did not present frustration of a charter party.

The law in frustration is clear if the event is unconnected with the parties, such as the destruction of a vessel illegally

or a strike. But how long must a strike be to frustrate a contract? My view is that a strike must result in performance of the contract which would be radically different from that intended by the parties. I strongly recommend that you include express provision in the contract for this.

The next item I would like to look at is termination under clauses in the contract. A difficulty with the concept of material breach is deciding when a breach is material. Parties without prejudice to their rights of common law may try to ease the problem by providing that, in the occurrence of certain events, the contract may be terminated. An indirect example is the provision that time is of the essence. The phrasing of such a provision, however, must be handled with care.

One of the standard form contracts by one of the world's major oil companies, which probably intended to state that time of performance by a contractor was of the essence, a provision which in the context of the North Sea would have commercial sense, did not say that. Instead the contract merely stated that time was of the essence. However, the contract, as common, had a provision that invoices were to be paid by the oil company within 30 days, which was a condition experience suggested was not always complied with. The result was a valuable weapon in the hands of our client, a contractor.

Sophisticated termination clauses in commercial contracts may provide for termination in two distinct cases, either a failure of performance or insolvency. A simple instance of termination in failure of performance is: "A company may by written notice to the contractor terminate the contract if the contractor breaches any conditions of the contract." Whether this condition is accepted depends on the care with which the contractor examines the contract and the bargaining parties. To be exact, I should say the contractor's lawyer.

Termination clauses which operate on the insolvency of one of the parties are not always drafted with sufficient care. For example, a clause in the contract for the supplier of deep freeze cabinets offshore provided for: termination if a party shall "become insolvent, shall go into liquidation, whether voluntary or compulsory, or a receiver shall be appointed of the assets of the party already a part thereof." These comments I think can be made in this drafting. The word insolvent is ambiguous. It could mean practical or absolute insolvency. The phrase "shall go into liquidation" may not cover the situation where a provisional liquidator is appointed, because, at that stage, there are no winding up orders.

Indeed, if one wishes to attack the drafting of such clauses, their weakest point is liable to be a failure to clearly deal with the appointment of a provisional liquidator, or what we call in Scotland a judicial factor. The clause does not make the normal exception of voluntary liquidation for the purposes of amalgamation or reconstruction.

Oil companies are very much interested in maximizing their cash resources. For example, in the United Kingdom we have recently received a major oil company mineral exploration grant.

A grant simply means that they do not repay the money. A mineral grant in the United Kingdom is worth 35 percent of the total cost. You can imagine someone putting 10 million pounds down and receiving 3.5 million pounds back. They are going to want that grant. They only get it back in the United Kingdom if they happen to be a United Kingdom company.

This is simple to do. But, if you have made your original contract whereby there is no question of the amalgamation, reconstruction of that company, and you lose the 3.5 million pounds initially, with more to come, then I do not think that you are going to be hired for very long.

One problem needs special mention. That is the provision of payment of hire charges. Late payment of hire may give rise to the owner's right to withdraw from a charter. This causes further problems. When is the hire due? The charter may commence in Panama on the delivery with hire to be payable in London in monthly installments from the time of delivery. But, at what time in London? Which time zone governs the payment of hire? What if payment is due on a weekend or on a holiday?

For example, the case of Mardorf Peach & Co. Ltd. v. Attica Sea Carriers Corp. of Liberia [1977] A.C. 850 (H.L.). When is payment made? If payment is by credit to a named bank, is the payment made: (a) when a charterer instructs his bank to make the transfer; (b) when a charterer's bank advises the owner's bank of the credit; (c) when the funds reach the named bank; or, (d) when the owner's account is credited.

In my view, the answer is probably (c), that is, when the funds reach the named bank. If it is when the owner's account is credited, it may involve a day, or a delay for a computer print-out. The contract should make clear what happens but often does not.

In this instance, what happens if the bank's computer breaks down? You have to think of quite a multiplicity of factors.

Avoid what is meant by material breach by having express provisions on a breach. You should have survival clauses so that parts of the contracts will survive the rescission for a material breach. Survival clauses are appropriate, for example, for exclusion clauses. Ashton O'Dwyer mentioned indemnity clauses, secrecy clauses, clauses propagating jurisdiction and arbitration clauses.

A few other points. I would say, on the indemnification clause, that the latest one I've seen by one of the majors simply said: "the consultant shall indemnify the company, its servants and agents, against all claims by and liabilities to third parties." We do not have the same situation as in Texas or Louisiana, and therefore no lawyer worth his salt who is acting for a service company would accept that. I have, however, seen it accepted. Such clauses should exclude indemnification against reservoir damage, sub-surface damage, pollution damage, or other damage resulting from sub-surface damage. Unless it says that, then your client can be placed in a bind. If I am acting for an oil company, then normally we

will accept these modifications to the general clause. If, however, you do not raise it, they will not give it to you. I would say do not try and pull fast ones on the oil company lawyer.

Our aim is to try to produce a fair contract, reflecting the wishes of both sides. I saw this reflected quite dramatically in a Scots partnership situation. Scotch law is different from English law and we have a situation whereby a partnership is a separate legal entity distinct from the members of the partnership, so they are individual partners. So, we have a legal persona, partnership, and we have the individual partners. The person who was acting for the service company in this instance did not point this out to a lawyer from Houston, and, in fact, the oil company had to pay out 4,000 pound in damages in an out of court settlement.

This lawyer, however, lost his client and all the work involved there, which might have been hundreds of thousands of pounds.

RICHARD SPELLACY: In my stand, I will now try and give you some set of general legal comment from a contractor's point of view. Once you have an offshore rig, the services that are required can generally just split into two categories: (1) transport, and (2) services. We will take transport first. In this case, transport would consist of the primary route which is by sea, supply boats, etc., and the secondary route which is by air, i.e., helicopter and fixed wing aircraft. Lastly, the support services to these routes ashore will utilize conventional land-borne transportation, but all these contracts are very well covered by standard provincial contracts and we will try to touch all those.

When industry is being carried out on land, the majority of the variable factors can be calculated and hence most contracts will be carried out on a turnkey basis. This has been the practice of the oil industry ever since its inception. However, once the industry goes offshore, then the variables imposed by inclement weather set up problems so difficult that only in extreme cases will an operator attempt any kind of project on a turnkey basis.

Slumps in the industry where operators, desperate for work, will turn their hands to almost any remedies to work their idle equipment tend to bring out these turnkey contracts. However, in a normal circumstance, the equipment for all services offshore tends to throw the majority of onus upon the oil company rather than on the operator of that equipment.

The second group of contractual services will be those services actually required by the oil company to service the well that they have drilled with the drilling rig. These services include such things as diving, drilling mud, mud engineering, cementing, supply of cement, well logging, well testing, and so forth. However, these contracts will be much more complicated than the contract of the transport equipment.

We contract the equipment in two modes, i.e., standby and working. The equipment will be out on the rig for anything up to 3-4 weeks or more to do a job that may take one week. Once it gets out there, you cannot always get it off, and once you get the men out there to service their equipment, you cannot always get them off either. Consequently, they will have two modes of payment -- standby and working, the same applying for the men.

The contract will also have to cover the hiring of the equipment during transport to and from the rig and the risks incurred by that equipment if, for example, some crane operator drops a million dollar separator into the sea. One also has to factor in standby time, while the equipment might be at shore at the oil company's disposal. Various insurance companies provide for a package like this.

One of the contractual difficulties we often face is that in addition to carrying out the normal supply of our work, we are asked to carry out research work for scientists. All of our contracts have to cover any damage that might be incurred in work of this nature.

Our standard form contracts tend to be rather abbreviated because a lot of our chartering is done over the telex, but they invariably make reference to far more complicated standard texts such as both-to-blame collision clauses, the York-Antwerp Rules, etc.

A modern supply boat is highly sophisticated and is extremely expensive, starting at 15 million dollars and working up. These craft have evolved during the past 35 years from fairly simple craft which were in fact converted tuna craft, first used by operators working offshore in the Gulf of Mexico. The chartering of these vessels has become very sophisticated since then, becoming really complex in the early 1960's when the oil industry started to penetrate places such as the North Sea. There the operators of new generations of supply vessels were primarily shipowners who were accustomed to chartering a ship in accordance with standard maritime contractual practice. This led to an evolution in the supply boat contract, from what was a fairly standard simple form in the Gulf of Mexico 25 years ago, to the complex, considered documents that allow the supply boat industry to charter much more expensive craft on the open market.

More importantly, they allow supply vessels to trade within any recognized maritime limits.

The shipowners in Europe are used to frequenting the Baltic Exchange and living by the rules of the standard documents produced by the Baltic International Maritime Conference. The Baltic Exchange is a building in London that acts as a place wherein owners of cargo and ships and brokers of cargo and ships gather to fix trans-shipping and cargo movements the world over. The Baltic Exchange is very similar, in fact, to Lloyd's of London in that there is a floor and there are brokers and there are purchasers of the services, but there the similarity ends.

At Lloyd's there is a well-organized structure of underwriters, underwriters' boxes, and a broker simply goes straight to a box to obtain the service that he may need. The Baltic Maritime Exchange is a more informal gathering of people who mix and discuss their needs and either fix their ships or transport their cargo as their needs may be. However, this loose gathering is fairly well governed by the Baltic International Maritime Conference and its documents. The majority of trading has been carried out in accordance with standard conference documents. One that comes to mind which you will all be familiar with is Barecon A, which is the Baltic International Marine Conference's bareboat. When the supply boat industry started to become more widespread, and the more sophisticated, the Baltic International Conference produced its own charter party document known as the Baltic International Maritime Conference Supply Time, which is generally abbreviated to BIMCO Supply Time. This is the standard form.

The BIMCO Supply Time document was compiled mainly by operators of supply vessels and was meant for handy referencing when chartering by telex or spot chartering on the international market. As there is a trans-shipping market in various ports of the world where heavy concentrations of oil field activity occur, there is a spot market for supply vessels, albeit always on a 'time' basis. This document was composed by the Baltic International Maritime Conference; however, the majority of input to that document was from the supply boat operators themselves. As the document itself became heavily loaded in the supply boat operators' favor, every major oil company and its legal department decided that they have to have their own standard charter party; thus today, it is normal when dealing with a major oil company to accept their own standard contracts which will be an adaptation by that company's maritime or tanker department of either their own standard marine tanker contract or BIMCO Supply Time form.

The BIMCO Charter Party includes a face page, which contains the broad details of the contract, i.e., port of delivery, redelivery and cancelling dates, period of hire, etc. It is in fact a title page. What follows is the guts of the contract. It is composed largely of what we in the business call legal boilerplate. I will briefly run through the form and some of its peculiarities to highlight the difference in a time charter of this nature as opposed to a time charter that a standard owner might face.

In clause one we have the time period, the first normally occurs in Section B where the charterers have the option to extend. In an oil field contract, particularly the ones that have occurred off Canada, they have been there to support a rig drilling on a number of wells. Wells normally are not very cooperative. They sometimes run way over time as did the first discovery wells on Sable Island.

If you are an oil company and you have issued a standard time contract for your equipment and all of a sudden you find that you have your rig but your helicopters have run out of time

and your supply vessel has run out of time and somebody has contracted them elsewhere, you have a problem. Normally the contract will cover adequate extensions to allow completion of the well.

The next one deals with delivery. Normally under standard tramp shipping or liner shipping, an owner will accept a delivery clause such as passing Gibraltar, dropping the pilot outward bound, anything of that nature. In oil field terminology, the vessel is always delivered along side at the base port and it always is redelivered along the side of a base port, or at an alternate specified port.

Also, in this clause, there appears another peculiarity, and that is a mobilization or demobilization clause which applies to ships. Normally the marine industry, being very mobile, has no need for mobilization clauses to mobilize equipment from one part of the world to the other, as it is their job to move the ship. However, the oil industry is in a fixed position, or geographically it is fixed, and they have to mobilize this equipment from one part of the world to another. We have a ship which is going on charter to a customer in St. John's this summer. We mobilized that ship from Japan so the mobilization itself is a separate clause in the contract to cover this.

Once you pass the delivery clause, you proceed in a fairly normal course, i.e., the employment clause, which gives the employment limits, is fairly standard. Next comes the "owner is to provide" clause. We then have clause 5, which states what the charterer is to provide. In the BIMCO Charter Party, it is a lot. To give you some idea, the owner's provision covers 12 lines, while the charterer's provision, including bunkers, covers 40 lines. Obviously, that is the state of affairs that owners would like and it's the state of affairs that we never get. But it is a good place to start.

In general, due to the uncertainties of the trade, the supply boat operators try to place the onus for any variables upon the oil company. This is well illustrated when we come to the bunkers and lube oil. We will run the ship from the base port to location and back again, but we may be occupied chasing icebergs, we may be occupied just steaming up and down standing by the rig itself. So, fuel and lubes are something that we can never calculate to any degree of certainty. This pushes right back onto the charterer himself.

Clause 7 covers the hire and how it will be paid and how it increases. This clause allows for certain escalators to cover the owner on any increase in costs of the charter party. The interesting thing is that originally the formula that is outlined in the clause would take care of the actual increase in wages plus a small increase in other costs. However, with the increased sophistication of these vessels, this particular clause, if it is used, becomes grossly unfair towards the oil company. For example, a 20 percent increase in wages would comprise approximately 30 percent of our costs these days and will allow us to inflict a 12 percent increase on a charter

hire. The actual increase in charter hires reflects that increase in wages and should be closer to 7 percent. So, we are just delighted when somebody accepts that escalator clause. Normally, this clause is modified to reflect reality.

Clause 8 deals with the redelivery of the vessel. There are various options for the oil company. Again, this peculiarity of mobilization and demobilization arises. It is to cover the times when the owner of the supply vessel has mobilized his equipment to a remote area where there is no prospect of continuing consecutive employment beyond this particular job. Interestingly enough, this is the case at the moment in Canada, because the oil field here is still in its early stages and there is no other well developed market in this area. Thus, an owner mobilizing equipment here has to face the probability that when his contract is finished he will be unlikely to obtain consecutive continuing employment unless it is with the same oil company. When a supply boat owner gets a job in Canada, he invariably asks for a demobilization to the nearest oil field activity, which in this case would be the North Sea.

Clauses 9 to 13 are more standard boiler plate items. Clause 14 deals with towage and anchor handling. As an addendum to the contract, we normally specify the amount of equipment and type of equipment that will be carried. This also covers towing. It simply says, as I have made reference to earlier, that the towing vessel will be governed by U.K. Standard Towing Conditions.

We manage to get our brief contracts, by making reference to items such as the U.K. Standard Towing Conditions, which are otherwise on four forms of close-typed foolscap pages. Here, we have managed to dispose of them in two lines. In Canada, however, we have another condition that enters the list at this time, and that is the towing of icebergs. In our charter parties, we always have to specify that the vessel will be capable of standing by and towing icebergs away from oil rigs.

Clauses 15 and 16 are standard boiler plate again. Clause 17 is salvage. This is a clause that is dear to every supply boatman's heart. All supply boat skippers and owners are basically pirates at heart. This is a clause that is unique to the supply boat trade. The build of these ships quite accidentally makes them very efficient towing and salvage vessels. This clause must be included to allow for salvage operations to be carried out while this contract is in force. Normally, the clause that is proposed here proposes that salvage will be to the benefit of both parties.

Clause 18, however, is there to restrict the more piratical impulses of both the owner and his captain. It is a fairly normal guarantee to the charterer that the owner or operator of this supply vessel will not claim the salvage on the oil company's equipment used in this operation. We have had three or four salvage claims.

Clauses 19 through 27, again, are standard marine boiler plate covering such items as general average, both-to-blame

collision, arbitration, etc. This, then, concludes the BIMCO Supply Time form and allows me to comment on some of the peculiarities of chartering in Canada in the 1980's.

It has become the custom of the trade over here for the operator of the supply vessel to supply lube oils in return for a fixed payment for a charter. This is not something that we would normally desire because it is not something that we can control. The consumption of lube oils is a direct function of the amount of steaming hours on our main engines and we cannot control that. However, as all of the people have pointed out today, the oil companies tend to have the upper hand in a lot of these bargains, and they have forced this custom upon us because they really do not want to be bothered with supply payment of lube oils.

We have mentioned the towing of icebergs. It seems to be a fairly simple function until one actually tries it. Attempting to tow an iceberg with an inexperienced skipper, even with the proper equipment, can lead to hilarious and frustrating results. Every season we have ships whose crews have never done this before and we have a fresh crop of ships limping into port with iceberg towers wrapped around their propellers and bent bows because the tool pusher gave instructions to push the iceberg. The inability to carry out this function properly can lead to tragedy.

Chartering in the 1980's holds yet another problem for the oil company and the owner of the supply boat alike -- the hazard of currency. When an operator has to purchase a vessel in U.S. dollars, his own currency may be pound sterling and he has to operate in Canadian dollars. He has to incorporate hedges into the contract to try and allow for currency fluctuations. Each and every supply boat operator has his own version of these hedges. I will not go into them because otherwise I would be here all day trying to detail the various exchanges around.

There is also a problem with customs duty. Canadian Customs and Excise insists that if a vessel runs between two Canadian ports then you must pay duty on them. This is all very good, except that you do not have to pay duty if you are a British flag ship. If a British flag ship is trying to compete with a German flag ship, you have an edge over the Germans. Interestingly enough, if you are a Canadian flag ship trying to compete with a British flag ship, then you have no edge at all. This seems somewhat inequitable when the government stresses Canada for the Canadians.

Lastly, the biggest peculiarity of all in the Canadian charter scene is income tax. Canada has taxation treaties with various countries throughout the world and each and every one of them is different. There is not one single thing in any one of them that is the same. If you have ships, as we have, under a number of flags, then your problems have just multiplied. We have ships under German, Belgian and Canadian flags. The taxation complications are absolutely horrendous and they must be covered under your contracts. I will give you an example. There is a treaty currently in force between the U.S.A. and

Canada which allows American supply boats to operate here without paying tax here. The same vessel with a Belgium flag has to be taxed here as well as in Belgium. Consequently, you have to work out the tax implications on that and try and get your customer to pay for it.

You have just heard me go through the standard BIMCO Supply Time Charter. The title page with three close-typed foolscap size pages. It is nice and simple and you can quote parts of it over the telex. Presently in Canada, everybody wants their own contract.

Right now, the smallest contract used by major oil companies is 28 quarto pages long with various addenda. As you can see, chartering in this country has become a very complicated business.

I would like to move on, very briefly, to the other forms of chartering. I have already mentioned helicopter and fixed wing aircraft. Their chartering would be very similar to those of supply vessels, with the exception that a higher base rate will be charged for the equipment and there will be a flying hour charge to allow for the use of the equipment offshore. There will usually be a certain minimum flying hour period specified in the contract.

I have tried to convey to you some of the complexities that are involved in this work, and I hope, to some extent, that I have succeeded.

DISCUSSION AND QUESTIONS

GORDON BECKER: I have some questions to address to Mr. Spencer. I believe you have mentioned that a typical construction contract for a drilling rig often has a provision in it permitting the purchaser to have an inspector on the premises for the purpose of looking at, approving or disapproving certain aspects of construction. How does the purchaser prevent himself from having such a provision used against him? I had in mind, following delivery, the purchaser asserting that some of the vendor's warranties concerning the rig have been breached. Is not the vendor in good position to say, "Well, your inspector approved such and such, and you cannot now turn around and claim that the work was unsatisfactory or that the material was not proper material"?

My next question is this. You mentioned that, increasingly, the somewhat familiar provision that title to the vessel, as it is being constructed is passed to the purchaser, is falling into disfavor. This prompts me to ask you whether a typical construction contract for a drilling rig may have a provision that permits the purchaser to withdraw the rig from the vendor's yard, say, in case of insolvency or bankruptcy on the part of the vendor.

Lastly, the question about financing which involves the bare boat charterer as well as the owner of the drilling rig.

We assume, of course, that there will be an assignment of charter hire by the owner to the lending institution, that the bare boat charterer will consent to this assignment. Are there any danger signals for which the bare boat charterer should watch in this situation? For example, would he be wise to insist on a provision that preserves his right to set off from any payments assigned, amounts of money due from the owner to him under the terms of the bare boat charter?

EDWARD SPENCER: Taking the first question about the inspector in the builder's yard, or as he is more usually called, the supervisor. The supervisor under the contract is said to be there to supervise the construction and also to look at the materials which are being used, to see that they are up to the specifications in the building contract. The provisions are usually such that if a supervisor finds that it is not being built properly, or the materials are incorrect, then that matter is raised immediately with the builder, and a decision is taken as to whether the builder is correct or the supervisor is correct. If they cannot agree, then there is usually a provision whereby the classification society decides who is right and who is wrong.

Therefore, mostly anything which is raised by a supervisor will be corrected before the contract is completed. However, I think you probably have a very good point that if the supervisor has been there and he has allowed something to go wrong or something to be incorporated which he said was all right, then subsequently I think it is very unlikely that the purchaser would have good cause of action against the builder.

GORDON BECKER: Is there anything that the purchaser can do to protect himself against this consequence?

EDWARD SPENCER: Well, the supervisor is there as his agent and, therefore, he is virtually bound by what his agent is doing. Either he gets a good chap there to be a supervisor or else he sacks him if he does not do what he is told to do.

I do not think that he can have his cake and eat it.

The second question was concerning a building contract under which parts of the rig passed to the purchaser as he paid the various instalments on the purchase price. There are provisions written into a contract such as those which allows the purchaser to go in and use the facilities of the builder to finish the vessel or finish the rig.

That was probably fine in the days when ships were being built of wood and you need a few shipwrights to finish the work, but in the day of the modern ship, it is really quite impractical. There is, of course, a provision such as you suggested, to allow the purchaser to take away his property if the builder becomes insolvent. The problem with that, of course, is that it may not be in a state where he can take it away, or a liquidator or a receiver may say it is his or the company's. I think those are two of the main reasons why that type of contract is now falling out of favor.

As for the third question regarding the assignment of charter hire under the bare boat charter. I was talking about the financial bare boat or financial demise charter where, except at the end of the lease period, virtually all payments go one way, that is, from the charterer to the owner.

I cannot think of any provision in that type of charter where the charterer is going to get any money until, under the terms of the charter, the rig is sold and the sale proceeds are divided as they have been agreed in the contract.

GORDON BECKER: Supposing the owner did not keep up the vessel's registry properly and the vessel became forfeited? That would be a situation where the charterer might well feel that to keep on that charter hire would be an unfair burden for him to bear.

EDWARD SPENCER: I suppose that in that type of contract there are only two main obligations on the owner. The first is that he should give to the charterer the quiet enjoyment of the vessel during the charter period so long as the charterer performs his obligations. The other one you have highlighted is that the registration should be kept up. Certainly, once it is under the British Shipping Register, you do not really have to do anything else during the time that it is there which would make it come off the Register, because all things such as keeping it in the right classification are the obligations of the charterer under the charter party.

I suppose that is one of the main reasons why it could be taken off the register, because it does not fulfill the requirements of the Department of Transport surveyors.

I would agree with you, theoretically, that is one possibility, but it is very unlikely.

GORDON BECKER: Thank you.

WYLIE SPICER: I would like to ask Ashton O'Dwyer a question. I am wondering what the relationship is under American law between a claim under the Jones Act by a seaman and rights to entitle him to worker's compensation?

ASHTON O'DWYER: Well, if a seaman is covered by the Jones Act he actually has two remedies against his employer. One is the remedy of maintenance and cure which is awarded to the seaman who was injured in the service of the ship, without regard to fault on his employer's part, and without regard to unseaworthiness on the part of the vessel. This maintenance remedy is an entitlement to a daily allowance which is intended to compensate the seaman for the value of the food and lodging that he would have received aboard the ship had he not been injured.

The rate of maintenance today is an issue that is being litigated all over the country. Until the last year and a half or two years, the rate had been fixed at \$8.00 a day, through

custom really, and the fact that contracts with unions and ship owners arbitrarily fixed this \$8.00 rate. In today's economy with what things cost and what lodging costs, \$8.00 is simply unrealistic. At least, from the plaintiff's perspective.

Defense lawyers like myself have been able to demonstrate through motion picture that you can, when you are feeding a large group of men, live reasonably well on \$8.00 a day. Unfortunately, none of the judges before whom this has been litigated in New Orleans has bought it. This has been proven through the testimony of economists, who have studied what food and lodging cost when the \$8.00 a day rate came into vogue. Plaintiffs have had their economists project that same cost forward. I believe the highest daily maintenance award so far is in the neighborhood of \$20.00 a day.

Part and parcel with the maintenance remedy is the remedy of cure, which is the seaman's entitlement to medical expenses.

These are due without regard to fault, if he is injured in the service of the ship, until he reaches a point of maximum medical cure. That is, where he can no longer respond to treatment or until such a time as it is determined that his disease is incurable. For instance, what happens to the poor fellow who is suffering from cancer? He was stricken in the service of a ship. Maybe he worked on a chemical carrier, and his condition is terminal.

The law says you cannot expect the shipowner to continue to pay this man until he dies.

Consequently, there is the nonfault remedy of maintenance and cure and there is the fault remedy of damages. You do not offset the man's damages on what he received by way of maintenance and cure.

WYLIE SPICER: But you can bring an action separate and apart from recovery of Worker's Compensation?

ASHTON O'DWYER: Yes, the seaman has no Worker's Compensation remedy as such. He has the right to maintenance and cure and the right to damages if his employer is at fault if the vessel was unseaworthy.

EDGAR GOLD: Mr. Chairman, I would like to try and return for a few moments to the question of definition which you have written eloquently about, and several of the speakers today have already referred to.

I am wondering whether this dilemma will not eventually be solved by the CMI convention which is, at present, being worked upon by IMO: the International Convention of Offshore Mobile Craft, which was produced in draft form during the Rio de Janeiro meeting of the CMI.

The discussion there showed that these craft are not really ships the way we know them. No more than the helicopter is within the Jones Act parameters. It is not so much looks, but it is also the operation. I think that is the real key. These craft are not being operated as ships.

The draft convention defines these craft as: "any marine structure of whatever nature not permanently fixed into the seabed which (a) is capable of moving or being moved whilst floating in or on water, whether or not attached to the seabed during operations, and (b) is used or intended for use in the exploration and exploitation, processing, transport or storage of the mineral resources of the sea-bed or its subsoll or in ancillary activities." It would seem to me that a completely new regime for these structures, because I refuse to call them ships, will perhaps solve this dilemma with which we have been faced.

WYLIE SPICER: I wonder if you have any confidence that the Canadian government is likely to adopt that convention?

EDGAR GOLD: Well, that is an interesting question, Wylie. The only time the Canadian position has been tested was during the MARPOL discussions in 1973 at IMCO. There was a very strong discussion between several of the Maritime countries on one side and Canada on the other side. Canada argued that these structures should not be classified as ships against the very strong opposition of some of the Maritime countries. So, it seems that the Canadian position going back almost a decade is that these are extra-territorial craft rather than ships in a normal manner. With respect to the question of limitation of liability, as a precondition to operating in the offshore, many of the oil companies enter into operating agreements with the government which provide strict liability provisions with respect to things like pollution. Whether or not those operating agreements impinge on the rights of the owners or operators of rigs to base defenses on limitation of liability is not entirely clear to me.

Nevertheless, there is a very extensive regulatory regime in this country which does attempt to provide strict liability provisions in some cases, by way of statute in the North, but in other cases by way of operating agreements, which are required for offshore operation.

And, on behalf of the organizers of this particular session I would like to thank all of you for coming.

FINANCING OFFSHORE RIGS

Discussion Leader W. Wylie Spicer
McInnes, Cooper & Robertson
Halifax

W. WYLIE SPICER: This afternoon's session will deal with the Financing of Offshore Rigs. I would just like to thank John Murphy for his assistance in organizing this particular panel, and also the LSI people who have been kind enough to allow us admiralty lawyers to muscle in on the Law of the Sea Institute Conference. I am sure that we have learned a lot. Perhaps some of the Law of the Sea people have learned something about admiralty lawyers. Unlike this morning, we only have two speakers.

Mr. Spencer was educated at the Royal Naval Colleges of Dartmouth and Greenwich in England. He then served as an executive officer in the Royal Navy for 20 years, during which he managed to pass his law examinations. Having done that, he retired from the Royal Navy in 1970 and joined the London-based legal firm of Linklaters and Paines. He became a partner in 1975. He practices mostly in shipping, aircraft and lease financing.

Joe Macdonald is from Cape Breton. He received his law degree from Dalhousie and a Master's degree in law from New York University. Joe is a partner with McInnis, Cooper and Robertson, a Halifax law firm. He practices predominantly in corporate and commercial areas.

I would now like to turn the podium over to Mr. Spencer.

E. S. SPENCER: Ladies and gentlemen, I am pleased to be here this afternoon. I would like to say that in my paper I shall mention one or two things about Liberian, Panamanian and United States law. I am not qualified in any of those, so if I am off the mark I would be very pleased if any Liberian or Panamanian lawyers amongst you, or any U.S. attorneys, would like to correct me.

While accurate figures are difficult to obtain, it appears that approximately 20% of the semi-submersible fleet and 35% of the jack-up fleet on order at the end of 1981 may not, at present, have employment. There will need to be a considerable increase in demand of such units if all rigs which are available are to find employment in the next 2 or 3 years.

Jack-up and semi-submersible drilling rigs bear little resemblance to conventional ships but they are nevertheless considered to be so. They are, in the main, governed by legislation which applies to merchant ships. This means that according to the country in which the rig is registered and operating, there will be a well developed or perhaps not so well developed system of law applying to the safety standards to which the rig is built and maintained, the crew required to man it and those creditors who are able to make claims against the rig as well as its owner.

This gives some certainty and assurance to banks and leasing companies who finance rigs. Firstly, the rig will be registered on a national shipping register with the country whose flag it flies and this will be prima facie, if not conclusive, evidence of its ownership. Secondly, there will be a register upon which mortgages to secure loans in favor of financing institutions can be registered, which will establish the priority of one lender against another. You must remember that in certain jurisdictions mortgages may need to be registered otherwise than on a shipping register, such as the companies register where the company is registered, in order to protect the charge against a liquidator or creditors of the owning company. Thirdly, either statute or case law would indicate to a financier how its mortgage will rank in competition with other claims against the rig or its owner which may constitute maritime or statutory liens on the rig.

It must be remembered that a person having a claim for goods or services supplied to, or damage or injury caused by, a rig, unlike most other chattels or other pieces of equipment, can and will usually be more successful in bringing an action in rem against a rig, instead of an action in personam against the owner of the rig.

The merchant shipping legislation applying to the rig will also give some protection to the owner, in certain cases of loss of life, injury or damage to property caused on or by the rig, by entitling the owner to limit his liability to a certain value. This is designated in gold francs for each ton of the rig's tonnage, unless it can be shown that such loss of life, injury or damage was caused by the actual fault or privity of the owner.

Let us now look at the purchase of rigs, which are, in most jurisdictions, considered to be personal chattels coming under the classification of goods, unless special legislation applying to ships takes them out of that category. One such exception is that the title to most goods when they are sold can be transferred by delivery. However, all major maritime countries require title to a ship to be transferred via bill of sale. It is, therefore, the legislation which applies to the sale of goods which will usually govern a contract for a sale of a rig, whether it is second hand or a new construction.

Careful attention is to be paid to the conditions and warranties which are first titled, encumbrances, the rig corresponding to its description and the quality or fitness for a particular purpose which is implied in sales contracts by such legislation. It is also important to know the extent to which any such conditions or warranties can be modified or excluded by agreement between the parties.

Considering first the purchase of a second hand rig, the 1966 edition of the Norwegian Sale Form or the 1977 edition of the Nippon Sale Form, each being a standard printed contract containing 15 clauses to which additional clauses may be added, will usually form the basis for a sales contract. These contracts are designed for the sale of conventional ships and

will need amending to take account of a number of special factors which apply to drilling ships. These are, firstly, the need to have an underwater survey of the submerged parts, due to the impracticability of docking a drilling rig, as would normally be done with a conventional ship before delivery.

Secondly, the transfer of spare parts and stores of both the rig and the drilling unit which is mounted on the rig, the cost of which, together with its spare parts and stores, may be as much as 30% of the cost of the rig. The logistic supply of spare parts and stores is a major operation entailing computer control, delays of up to 9 months in receiving replacement orders and the storage of a significant number of spare parts and stores ashore. The purchaser must therefore agree with the vendor on exactly what spares and stores he is buying, where they are located, and the ordering policy for spare parts and stores which the vendor is to carry out between signing the contract for sale and transferring title to the rig. If a large number of spare parts are stored ashore, they must be transferred in accordance with the law of the country in which they are located, without, if possible, paying taxes or duties on the transfer.

Thirdly, it may be that the rig is being purchased for the benefit of a drilling contract, the terms of which will be of much greater complexity than the time charter party with which a conventional ship may be sold. The purchaser will require to know exactly the state of the contract at the time of transfer. This will entail the vendor's giving a number of warranties and representations relating to the provisions of the drilling contract. In addition, a separate novation agreement between the vendor, the purchaser and the operating or exploration company will be required.

The other standard terms of the sale form will deal with the payment of 10% deposit on signing of the contract, payments of the balance, the release of the 10% when transfer of title is made and the forfeiture of the 10% to the vendor if the purchaser should fail to perform the contract.

In addition, a delivery of a bill of sale, at the time when the balance of the purchase money is paid or title is transferred, and, if the registration of the rig is being changed, a certificate of deletion from the old register are required. Cancellation of the contract if the rig becomes a total loss is another provision which will be included. An arbitration clause to deal with disputes and, undoubtedly, the most important clause, a warranty by the vendor that the rig will at the time of delivery be free and clear of all encumbrances, maritime liens, claims and debts, are included, together with an indemnity in favor of the purchaser against all loss suffered by claims incurred before, but in force after, title to the rig has been transferred.

In the case of a new building, the contract will be similar to a conventional shipbuilding contract, except that the equipment which is to be specified and procured by the owner may be as much as a third of the cost of the rig. The purchase

price will be payable by four or five installments. The first is payable on the signing of the contract. The second, third and fourth are payable at different stages of construction as certified by the Classification Society. The final installment is paid simultaneously with the transfer of title. A Builder's Certificate will replace the Bill of Sale and will contain a warranty of freedom from encumbrances and claims.

In some British shipbuilding contracts, the traditional system is retained whereby title to the part of the rig which is being constructed and paid for passes to the owner, with the builder retaining a lien on the rig for unpaid purchase monies. However, this is falling out of favor with financial institutions and owners, who naturally prefer to receive a full-blooded bank guarantee of the monies which they have already paid, together with interest, if the contract is cancelled or the rig is rejected due to the builder's default.

The shipbuilding contract will set out a sliding scale of liquidated damages payable to the owner for delay in delivery and minor failure of the rig to meet its specification. An excessive delay or a major failure will entitle the owner to reject the rig and cancel the building contract. If the contract is so cancelled, or if the builder becomes insolvent, the contract will provide for the owner to be repaid the purchase price already paid, together with interest at a commercial rate. This repayment will be guaranteed by the Refund Guarantee.

Other provisions of the contract will deal with approval of drawings, supervision and inspection of construction, tests, trials, documents to be delivered on delivery of the rig and insurance in case of damage to or a total loss of the rig. The Refund Guarantee will not normally cover repayment to the owner if the rig becomes a total loss. It is therefore important that the insurances should be comprehensive, covering builder's risks, strikes, riots, civil commotions, war risks, removal of wrecks and third party liability. The amount for which the rig is insured must take into account purchase money which is being paid and the commercial rate of interest on it, which the owner will be expected to get back in the event of a total loss. To insure that the owner will receive the insurance proceeds and that, if the builder becomes insolvent, they will not be claimed by a liquidator or a receiver, the insurance policy should be in the joint names of the builder and the owner, with a loss payable clause in the policy directing proceeds to be paid to the owner. In certain jurisdictions where the doctrine of third party benefit lies, it may be sufficient to have a loss payable clause.

The builder will normally give a guarantee for any defective material or workmanship which is discovered in the rig and notified to the builder within 12 months of delivery. This will exclude consequential loss caused by such defect. Where the rig is being purchased by a leasing company and bare boat chartered to the operating owner, provisions should be made for this guarantee to run in favor of the operating owner, until

such time as the builder is informed by the leasing company that it has repossessed the rig. It should then run in favor of the leasing company.

Arrangements should also be made for the building contract and the Refund Guarantee to be signed by way of security to any financing institution which is financing the building of the rig.

Turning to the actual financing, an owner will wish to finance the rig in the cheapest possible manner. The owner will also be concerned with keeping the operating costs of the rig as low as possible. This is compatible with efficient operation and certain restrictions which legislation and maritime trade union practice impose on him.

There are a number of ways of getting cheap finance, which depend upon where the rig is being built and the nationality and residence, for tax purposes, of the owning company. Cheap loans or credits are given by certain governments under an OECD scheme to assist their manufacturing industries and their exports. Details, for all of the 22 countries taking part in the scheme, are contained in a yellow OECD booklet which was published earlier this year. A typical example is a credit of up to 80% of the cost of the rig, repayable by 6 monthly instalments over a period of 8 years from the delivery, at a present interest rate between 8 and 9%.

If the owner considers himself to be an expert in predicting currency fluctuations, he may also wish to exercise his ingenuity or his gambling instinct by having an alternative currency facility in any loan agreement which he may take from a commercial bank. Of course, here he may not always be a winner.

Tax and investment allowances are available where the owner is a resident for tax purposes in certain taxable jurisdictions. These usually entitle the owner to receive a tax credit related to the amount of the capital expenditure which he makes on the rig. If the owner, due to lack of profits, has no tax liability, the allowances can be utilized by a company which does have a tax liability, which I shall refer to as a financial owner. In this case, the financial owner purchases the rig, bare boat charters it to the operating owner and translates the tax credit which the financial owner receives into a subsidized charter rate for the operating owner.

Needless to say, no government is going to give away tax handouts to bare boat charterers who reside in tax havens. Therefore, the owner has frequently to choose between residing in a tax haven and operating its rig under a flag of convenience, or carrying on its business in a taxable environment, with higher operating costs under a less opportunist flag, but with the advantage of being able to utilize tax benefits and cheap finance available to the residents of the jurisdiction.

Recently, using a cross-border leasing technique known as double-dipping, it was possible for a British lessor to purchase an asset, to receive tax credits on its capital allowances of 25% in the first year, and 25% on a reducing balance basis in

succeeding years, and then lease the asset to a United States company which will also receive the appropriate U.S. tax credit. That was a tax credit which was based on the aggregate of the rentals payable during the lease period. However, this innovative method of financing was disapproved of by the British Inland Revenue and it was stopped in March of this year.

Financial institutions have firm requirements about the security which they require to receive before lending their money. They also have preferences as to the flag under which the rig is to be registered. A financing institution will certainly require a mortgage over the rig and also an assignment of the insurances effected on the rig. According to the financial substance of the owner, other requirements may be either a parent company guarantee of the loan repayment — for example, if the owner is a subsidiary of a main oil company — or, if the owner has little financial substance, a good drilling contract so that the payments under the contract, when assigned to the financier, will provide cash flow security to service repayment of principal and interest on the loan. In the case of a single rig owning company, a financial institution may also require the shares of that company to be pledged to it by way of security.

Rigs are slow-moving, cumbersome structures and they may pay infrequent visits to territorial waters where judicial action can be taken against them. Moreover, they have a different pattern of employment when compared with conventional ships. These aspects pose problems to a mortgagee if the financing goes wrong and the security has to be enforced.

Comparing the advantages and disadvantages to certain types of mortgages, we found that a British Commonwealth mortgage will secure a current account, which means that the amount secured can vary in amount and change in currency, provided that it is within the terms of the loan agreement being secured. If the owner defaults, the mortgagee can make a private sale without a Court order and he can also take possession of the rig without a Court order and move it to the territorial waters of suitable jurisdiction, where rapid judicial sale through the Court can be carried out. These powers compare favorably with a Liberian or Panamanian mortgage.

A Liberian mortgage does not secure a current account and once paid down it is extinguished. This may pose problems if it secures a multicurrency loan, where one currency is repaid and the loan is redrawn in another currency. Words can be devised which either maintain the loan in its original currency and calculate the principal and interest with relation to an alternative currency, or which convert the loan without repayment. However, to my knowledge, there is no decided case on this point. There is a distinct reluctance on the part of Liberian practitioners to give a firm opinion that it works. This means that most banks, as a matter of caution, required a supplement to the mortgage to be recorded each time the currency of the loan is changed. There is also doubt as to whether a mortgagee can take possession of a Liberian ship without a Court order.

A Panamanian mortgage can secure a current account or revolving credit facility which fluctuates, but the maximum amount must be stated in the mortgage, and the mortgage instrument must also have a clause which states that the change in currency or the payment down of the loan should not be interpreted as discharging the security. Under Panamanian law, the mortgagee may not take possession of a ship without a court order; and the Panamanian court may regard a private power of sale as unenforceable and refuse to recognize it. An amendment has been proposed, under Panamanian law, to rectify those deficiencies, and we can only hope that it will be enacted in the near future.

If a financial owner is purchasing the rig to bare boat charter it to an operating company, then the financial owner and a bank which is lending money and which will take an assignment of the benefits of the bare boat charter's security will require the charter to contain firstly a liquidating damages clause, which, upon the charter being terminated as a result of default, will oblige the charterer to pay the financial owner an amount equal to his outstanding investment. This is usually the amount of charter hire which would, up to the termination, have been paid during the remaining part of the lease period, discounted at an appropriate percentage to allow for the financial owner's receiving his money back early.

Secondly, an obligation of the charterer to pay a similar amount if the rig becomes a total loss is to be included, which is backed by insurances for the same amount. Thirdly, a comprehensive indemnity from the charterer to the financial owner must be made in respect to all risks including that of ownership. Finally, a provision is included which will hold the charter hire payable by the charterer to take account of any change in the rate of tax credit during a lease period, or any other factor which would alter the returns of the financial owner while the rig is on charter.

In some jurisdictions, for instance the United Kingdom, financial owners require to be protected against every possible risk. This is on the basis that they are only entering the transaction to give the charterer the benefit of the capital allowances or tax credits which the financial owner gets. In return for such protections, the owner will be prepared to rebate up to 97.5% of the residual value of the rig at the end of the charter period. In certain other jurisdictions, financial owners are expected to take some risks, and, in return, they expect to participate in the residual value of the rig.

I would now like to discuss the financing picture in the pre-delivery and the post-delivery period. Those of you who practice financing will note that I have done this in the simplest possible form. I will not mention leverage leases, multiple lenders or collateral security.

We will start with the owner who has negotiated his building contract with a builder and the Refund Guarantee with the builder's bank. He has to decide whether he is going to get

the best deal by borrowing the money himself, or by going to a leasing company asking the leasing company to purchase the rig and taking it on bare boat or demise charter from the leasing company.

The owner has the choice of remaining the borrower with its drilling contract, or changing places with a leasing company, as financial owner, and becoming the demise or bare boat charterer. If the operating company becomes the bare boat charterer, then, of course, he takes the drilling contract with him.

Bringing the financing bank into the picture, it makes its first advance to the owner, which is paid directly to the builder to satisfy the first installment on the building contract. On making the advance, the financing bank takes a security, separate assignments, for the benefit of the building contract, the Refund Guarantee, the payments under the drilling contract and, if there is one, an assignment of all payments under the bare boat charter, which is, in addition to the charter hire, the liquidated damages which I spoke about earlier, if there is a default.

If we go on to the post-delivery period when the rig is delivered, the picture changes, and the security is re-organized. If the loan is outstanding between the financing bank, the owner, who is imminently about to pay the final installment and to take delivery of the rig, can either be a financial owner or a bare boat charterer, as I have previously described, either with the drilling contract or a demise charter.

When the rig is delivered, the financing bank takes: firstly, a mortgage over the rig; secondly, an assignment of the insurances effective on the rig, and either takes or keeps in place the assignment in the pre-delivery period over the drilling contract or the bare boat charter. Finally, again according to the substance of the owner, it may also take a parent company guarantee of the repayment of the loan, as I previously mentioned, and pledge of the shares of the owner may also be involved.

To end I would like to mention a few points about insurances which are of vital importance to both the owner and the financier of a rig, particularly, where there is going to be a large claim, a total loss, or a large third party liability. The types of insurances for hull and machinery, war risks and protection and indemnity risks, the latter being basically the same as third party liability insurance, are virtually the same to those on conventional ships, although the form of the clauses may be considerably different.

Hull and machinery insurances are effected through brokers, with underwriters, or directly with insurance companies. War risks and protection of indemnity risks can either be insured on the insurance market or through a mutual insurance association. There is an additional risk of damage from pollution, which may be caused by a blow-out from a well which, if the owner bears the risks, would require coverage. There is a mutual insurance association based in Bermuda which is specifically designed for

the oil and exploration industries and gives coverage for onshore or offshore property pollution, and also for bringing under control wild oil or gas wells or extinguishing oil or gas well fires. There is also a separate form of insurance, insurable on the market, which deals with the same sort of risks.

As you have seen, the financier will want to make sure that if there is a major casualty or total loss, the rig and the insurance proceeds will go to repay the loan or the liquidated damages under the charter party. To achieve this, the owner will either be required to assign the insurance to the financing bank, or the bank as mortgagee will be named as an insured party on the policy. There will be a loss payable clause directing the underwriters to pay the proceeds directly to the financing institutions. In some jurisdictions, such as the United States where there is a doctrine of third party benefit under contracts, the clause included in the policy states that the insurance proceeds that are to be paid to the third party will be enforceable at law, without the need for that party to be a party of the contract.

In the English jurisdiction and other jurisdictions where the doctrine of strict privity of contract still holds good, it will be necessary for the party who wants the proceeds to be a party of the contract. It is therefore important to know which law is going to govern the contract of insurance.

Insurance policies can be avoided by the insurer if there has been a breach of warranty at the time when they are effected or subsequently. The financing bank or financial owner will obviously wish to protect themselves against this. They can do this by taking out a separate mortgagee's or owner's interest policy or by having a breach of warranty clause in the policy, which names them as the protected party.

It is important to make sure that the separate owner's interest policy is not taken out by the same broker acting as agent, as it may affect the main policy. Otherwise, it seems to me, the actual or constructive knowledge of that broker which vitiated the main insurance will do the same for the owner's or mortgagee's interest policies.

The shipowner who owns a number of ships can reduce the costs of insurance premiums by placing them through a captive insurance company which is usually within its own group. In this method, a small percentage of the risk is retained in the captive insurance company, and the remaining risks are re-insured on the market. Here, the question is asked, what will happen if the captive insurance company becomes insolvent? Firstly, the small amount of insurance which it insured will be lost, but, secondly, and more importantly, if there is a large claim in the pipeline from the re-insurers, then any liquidator or receiver will be in a position to claim the monies coming under that claim unless they have been assigned to the financing institution. Therefore, it is important, where this situation prevails, to make sure that the re-insurances are assigned to the financing institution, and that there is also a loss payable

clause, sometimes called a cut through clause, which appears on those re-insurance policies and which indicates how payments are to be made.

W. WYLIE SPICER: Thank you very much. Both Ted Spencer and Ashton O'Dwyer have made reference to a concept known as limitation of liability. I will take this opportunity to give you an illustration or two of the effect of the successful defense of limitation of liability.

Canadian and American law differ substantially on the amounts that are relevant for purposes of ascertaining limitation of liability. When we talk about limitation of liability we mean the ability to limit liability against a vessel. That is why it is very important to determine whether a rig can be called a ship. If a court were to find that that type of damage arguably could give rise to limitation of liability, then the total liability of the owners, operators, and, in Canada, also charterers and managers of a vessel, will be limited to a figure based on the tonnage of the vessel multiplied by SDR's. It is quite possible, for instance, regardless of the fact that the fishermen, processing companies and other land lubbers have been adversely affected by a severe discharge or blow-out, that the total amount claimable by way of damages would be based solely on the tonnage of the vessel. Regardless of the fact that a claim may, on its face, be worth \$10 million dollars, claimants may recover far less.

Limitation is difficult to use in Canada because we are not a shipowning country. Consequently, our judges are reluctant to find in favor of limitation of liability. They say: "What are these people trying to do? They've caused \$10 million dollars' worth of damage and here they are coming to us and saying we would like to get off for a figure based on the tonnage of this vessel, which is, say, one million dollars."

Obviously, limitation of liability has a very severe effect on people who may be adversely affected by the operation of offshore oil rigs off the coast of our country. Having said that, I should also say that it is questionable whether or not a blow-out is a situation which a court would find to give rise even to the argument of limitation of liability. In my view, however, there are two or three old Canadian cases which make it worth a try if you are acting on behalf of an owner.

I will now call on Joe Macdonald.

JOSEPH MACDONALD: Ladies and gentlemen, my task this afternoon is to draw your attention to some types of legal considerations that may have a bearing on a drill rig or drill ship financing transaction but which are not of an admiralty nature. For those of you who are not lawyers, perhaps I can demonstrate that there is some justification for those yards and yards of clauses, subparagraphs, sections, subsections, etc., which you will find in the documents evidencing any rig financing transaction. To those of you who are lawyers, I hope my remarks will be of some utility in reminding us all just how much law there is out there to worry about.

I propose to mention a number of Canadian Federal statutes and Nova Scotia Provincial statutes neither because they are models nor particularly horrible examples but rather because I have some familiarity with them.

I will avoid, for the most part, reference to tax matters but would ask you to bear in mind that very often the most powerful force in shaping a rig financing transaction is the attainment of certain tax results for the various parties involved.

In essence, a rig financing transaction, particularly a new building, is a straight-forward situation. You have an owner who wants to get delivery of his machine and you have a builder who wants to get paid. Unfortunately, the matter becomes extremely complex from a documentary and legal point of view when the owner decides to use someone else's money to pay off the builder.

Consider a hypothetical situation in which the transaction is to be structured as a leveraged lease complying with the requirements in the United States Internal Revenue Code. In such a situation you could well find one U.S. bank representing the equity (and the tax benefits that go therewith), a second U.S. financial institution acting as trustee for the debt, a Canadian shipbuilder, an intended registered owner which is a Panamanian Company (perhaps the remnants of a prior aborted financing deal), a long-term charterer which is a Delaware Corporation and which is a subsidiary of a European parent company, an intention to register the vessel on the Liberian Registry, a captive insurance company which is to provide the cover, the rig in Halifax, some spares in Halifax, essential parts of the drilling equipment ashore in Aberdeen, and lawyers everywhere.

The lawyers' function in this situation, is to provide an opinion that the documents are effective and enforceable. Notwithstanding that the parties may choose the law of, say, the State of New York to govern the principal agreements, it will not be possible to ignore the law of various other places in respect of the transaction. Spares, stores, and equipment which have not been incorporated in the rig are chattels or moveables and the law relating to their effective transfer and mortgaging will usually be governed by the law of the place in which they are physically located at the time the transaction takes place. Similarly, until a newly built rig is registered somewhere, perhaps even after that for some purposes, a rig is a chattel and regard must be had to the place where it is when delivery occurs.

The Powers and capacities of various corporate participants to the transaction will, in large measure, be governed by the law of the jurisdiction at which they are respectively incorporated.

Finally, the place in the ocean where the vessel is intended to be worked is increasingly of concern in light of the extended jurisdiction being asserted by various countries over adjacent continental shelf areas. There is at least some

suggestion that national legislation requiring the employment of local personnel on rigs operating offshore of the Canadian east coast, for example, is raising in the minds of some operators a conflict between their obligations to conform with Canadian law on the one hand and their overriding obligation to ensure that the vessel is seaworthy on the other hand. Lenders, whose ultimate repayment often depends on the continued operation of the rig, should consider expanding the scope of the covenants contained in the lending documents to make it clear to the operator that they want neither an unseaworthy vessel nor a vessel whose operations are restricted because of failure to comply with local manning requirements.

All of these diverse legal regimes which may or do have a bearing on a transaction produce a need for that most charming of individuals, local counsel.

I want now to talk briefly about some of the range of local laws which may have a bearing on rig financing transactions and I propose to do so under five headings:

1. Laws relating to the transfer of title to goods;
2. Laws impacting on the lending transaction;
3. Laws giving rise to liens of other than an Admiralty nature;
4. Laws affecting the ability of the parties to carry out the transaction; and finally
5. Laws having a possible bearing on the operation of the rig.

LAWS RELATING TO THE TRANSFER OF TITLE TO CHATTELS

For the most part, in Canada, the laws relating to the effective transfer of title either absolutely or by way of mortgage of chattels are to be found in the provincial statutes. In some Canadian provinces these laws have in recent years been consolidated and brought up-to-date, in large measure borrowing from our American friends the work they have done on their Uniform Commercial Code. Such progress, however, has not yet reached Nova Scotia and accordingly reference must be had to statutes of varying antiquity, such as the Sale of Goods Act and the Bills of Sale Act.

The Sale of Goods Act in Nova Scotia is patterned on the original English statute and codifies and, sometimes, modifies the law merchant having to do with the sale of goods as it stood in England in the latter part of the last century. It sets out substantive law on the sale of goods within the province which apply to a transaction unless the written contract between the parties provides different rights. In reality, the Sale of Goods Act, or its equivalent in the jurisdiction where the shipbuilder is located, should be consulted prior to the drafting and execution of the building contract, but its provisions should be carefully reviewed, as a financing transaction approaches, to ensure that the rights of the buyer against the seller are fully understood. Similar considerations apply with respect to goods, the supply of which is not the

responsibility of the shipyard, such as the drilling equipment. These chattels, which often form a very large part of the total cost of the rig, are usually called buyer furnished equipment or BFE for short. Very often they are not, in fact, furnished by the buyer (who in a leveraged lease transaction may well be a New York bank) but are being sold to the buyer by affiliates of the "real" owner. The terms of such intra-group sales are often less clear than they might be, and care must be exercised to ensure that the parties are ending up in the legal position in which they wish to be. A second statute of considerable importance is the Bills of Sale Act. In this province, that act governs the form of both absolute sales and Chattel Mortgages and, generally speaking, will require the registration in the local Chattel Registry of at least any document which purports to impose a charge or mortgage on spares, stores and BFE not physically located on the vessel.

In some jurisdictions, the formalities of the transfer of title of chattels other than by delivery may require more than registration of a document in correct form. Care should be taken that the necessary procedures in the jurisdiction in which the goods are located at the time of closing are fully understood and complied with.

In Nova Scotia, because of the Conveyancing Act, the form of the document is no longer particularly important, as long as it clearly manifests an intention to convey certain identified chattels from one party to another either absolutely or by way of mortgage.

I might digress here for a moment to address a short word to my American colleagues. Gentlemen, the rest of the world does not necessarily understand what you are saying when you talk about "security interest." I realize that that is the catch all phrase used by the Uniform Commercial Code to describe a variety of interests which were formerly acquired by lender, assignees, and conditional sellers, but it is, for instance, a concept which is unknown to the law of Nova Scotia. What a conditional vendor, for instance, retains under the Conditional Sale Act is the "property" in the goods which are the subject of the contract. Assuming there has been compliance with the registration requirements of the Bills of Sale Act, the rights of a Chattel Mortgagee are largely to be found in the common law and are not necessarily the same as those which the lender expects to have under the Uniform Commercial Code.

One of the perennial problems for all lawyers is a statute with unintended effects. In Nova Scotia we have a number of these which could bear upon a transaction of the sort we are discussing. The one I wish to mention is the Direct Sellers Licensing and Registration Act -- a piece of legislation designed to regulate the door-to-door salesman. Unfortunately, the legislation is so drafted that, were there not an exemption granted by regulation, it would apply to the sale by shipyard of a newly built rig and potentially to the sale of the buyer furnished equipment. The Act provides certain rights of rescission to buyers which cannot be waived, and imports certain contractual terms which are, to say the least, inappropriate.

Fortunately, an exemption was created which was wide enough to cover the transaction.

Finally on this area, there is one federal statute to which reference should be made, the Export and Import Permits Act. In this country, import permits are required only for a very restricted range of goods and will not usually pose a problem. Export permits are, however, required, and permission to leave harbour for the first time will not be granted by the Customs authority without one.

LAWS HAVING A POTENTIAL IMPACT ON THE LENDING ELEMENT OF THE TRANSACTION

In most cases, the financial institution directing the transaction will wish to have all aspects of it governed by laws with which that institution is familiar. Accordingly, the documents evidencing the financing will be stated to be governed by the law of, say, the State of New York.

To the extent, however, that the enforcement of the documents may fall to the courts of the jurisdiction in which the goods are located, some consideration must be given to various local laws. Once the rig itself has been registered as a vessel pursuant to the maritime law of some country, the rights of the lender against the vessel will be governed by the relevant maritime law. However, to the extent that spare parts and stores are located ashore, the law of the situs of the goods may well have application in enforcement proceedings. Similarly, laws under which the borrower or other parties to the transaction are incorporated may have a bearing on the ultimate enforceability of the terms of the Agreements.

Law having to do with usury, consumer protection, interest rate disclosure, etc., are generally considered to be matters of public policy and, notwithstanding the parties choice of, say, New York law to govern the contract, the courts of another jurisdiction may feel bound to modify that contract in light of the public policy prevailing in the enforcing jurisdiction.

Nova Scotia does not have any usury law as such, that is to say there is no legislation in this province which limits the amount of interest which can be charged by a lender to a borrower. Nova Scotia does, however, have an Unconscionable Transactions Relief Act, which, in suitably vague terms, gives the court power to rewrite the agreement if, having regard to all of the circumstances, the borrower has been mistreated. The province also has legislation requiring disclosure to the borrower of the so-called true cost of the loan; the Consumer Protection Act, however, is directed to transactions other than the kind we are considering here but, nevertheless, one must be aware of this kind of legislation.

For many years, Canada has had an act called the Interest Act. This is federal legislation and I suppose represents a very early attempt to ensure that borrowers know what the borrowing is costing them. That act is in direct contrast to the usury laws which are found in some of the United States, in

that it specifically permits parties to agree on any interest rate they choose (Section 2).

There are, however, two provisions of the Interest Act which should be born in mind. Section 3 provides that where no rate of interest is "fixed" the maximum rate recoverable is 5%. The second provision of concern is Section 4 which requires that if the rate of interest is expressed to be for a period of less than a year, no more than 5% can be charged unless "the contract contains an express statement of the yearly rate or percentage of interest to which such other rate is equivalent."

Both of these provisions have caused some concern with respect to Euro-currency financings and it is important, in my view, if the transaction has any Canadian element at all, that you insert the necessary words to conform to the Interest Act. Euro-currency transactions commonly call for the fixing of the interest rate to be by reference to the London Interbank Offer Rate (LIBOR) for the appropriate currency and term on a given day. It is necessary to make it clear that the rate is in fact fixed by the lender and not by the market. The lender's scope for fixing its rate can be, and usually is, restricted.

With respect to the concept of a yearly rate or percentage of interest, it is to be observed that the word "yearly" in the Interest Act means a 365 day year. Accordingly an agreement to pay interest based on a 360 day year is covered by the requirement to express an equivalent "yearly" rate.

One Canadian chartered bank uses the following phrase for this purpose:

"the rate of interest based on a 360 day year is equivalent to a rate based on a calendar year of 365 days of 365/360 times the said rate."

Another aspect of local law which can have an impact on the lending transaction is the question of currency and, in particular, whether judgment can be obtained in a Canadian court for anything other than an amount of Canadian Dollars.

In recent years the House of Lords has substantially reversed the long-standing prohibition in England against obtaining judgment in anything other than Pounds Sterling and, in this country, courts frequently do make orders for the recovery of a debt in U.S. currency. There is one troublesome section of the federal Currency and Exchange Act which appears to require that a statement of money in legal proceedings should be stated in Canadian currency. Whether that is the correct meaning of Section 11 of that Act remains unresolved, as does the question of whether, if that is the meaning, the section is constitutional in so far as it purports to impose standards on the various provincial courts.

Oddly enough, the immediately following section of the Currency and Exchange Act clearly permits the creation in Canada of obligations denominated in another currency; hence, presumably, the usual clauses inserted in international borrowing agreements by which the borrower, in effect, promises

to indemnify the lender in respect of any currency conversion losses arising on enforcement, are not contrary to public policy of Canada.

Note, however, that both Nova Scotia and the Canadian federal law include a Gold Clauses Act prohibiting the denomination of obligations directly or indirectly in gold.

Now I want to discuss briefly the possible necessity of registering certain of the documents evidencing the financing transaction in the jurisdiction in which the goods are located at the time of closing, and I want to raise with you the question of whether the loan documents should not require the borrower to seek further registrations if and when spares are moved during the term of the loan. A typical example might well be a spare thruster unit for a semi-submersible, having, on its own, a value of a million dollars or more which would be moved from one shore location to another to be reasonably convenient to the rig wherever it was working. Located ashore, that spare will be subject to the laws of the place where it is located from time to time. It is quite likely that some filing of documents will be required in that jurisdiction to ensure that the lenders' interest in the item will be recognized in that location.

Even in the case of first delivery of a newly built rig and its registration pursuant to the maritime law of some country other than the place in which it is built, it may be prudent to cause a Bill of Sale or other document of conveyance to be recorded in the appropriate public office to avoid questions of whether local law will give full effect to the vessel being put under, say Liberian registry. In Nova Scotia, such filing would be made under the Bills of Sale Act in the local Registry of Deeds Office contemporaneously with the delivery of the vessel.

In the case of spares brought into the province, the document evidencing the mortgage should be recorded within 30 days at the Registry Office for the district in which the goods are located. Alternatively, and depending on the form of the financing document, it may be appropriate to register it under the Corporations Securities Registration Act, as to which one filing covers the entire province.

It may well be either desirable or necessary to file copies of the financing documents or some of them in the jurisdiction in which the owning company is incorporated. It is understood, for instance, the effectiveness of charges given by an English company depends upon their being filed with the English Companies Office.

Whether or not various assignments which are usually involved in rig financing transactions, such as an assignment of the charter hire or a pledge of the operating agreement, are required to be filed in a particular jurisdiction is often a nice question and will require reference to the local law on assignments and the registration thereof, such as in Nova Scotia the Assignment of Book Debts Act.

LAWS GIVING RISE TO LIENS OF OTHER THAN AN ADMIRALTY NATURE

I cannot speak for other jurisdictions, but in Nova Scotia the Legislature has a propensity for creating liens on, among other things, personal property and chattels, to secure either public revenues or public or private rights.

Where these liens rank against a vessel once it is delivered and registered under a foreign flag, I do not know. I do know, however, that lenders and lawyers both do not have a desire to find out what view a court might take of the question. Accordingly, it is usual to take steps to ensure that there are no liens outstanding against the vessel or spares or BFE immediately prior to delivery.

Liens can arise under a variety of acts; accordingly, the usual practice will be to have a checklist: first, of statutes to be reviewed to see whether a lien is created in respect of the particular type of vessel or spare parts you are dealing with; and second, if an act does create a lien, a checklist of the places at which the liens are recorded, to be examined immediately prior to closing.

Some examples of liens which can arise in Nova Scotia would include:

- (a) Local or municipal taxes owned by the shipyard or others involved in the transaction. Lifting the lien will involve having the shipyard or other party pay its local taxes prior to closing.
- (b) Workers' Compensation -- In this Province there is an almost universal compulsory scheme of compensation with annual assessments, based on his pay roll, payable by the operator of a business, such as a shipyard. The lien to secure the payment of the annual assessment is very broadly drawn and indeed may not be technically capable of being discharged at all. The Workers' Compensation Board, however, does not attempt to assert the lien as against goods such as a rig which have been sold *bona fide* but the practice is to obtain a certificate from the Board certifying that the shipyard is up-to-date in its payments.
- (c) Workers' Pay Protection -- Under the Nova Scotia Labour Standards Code, a lien is imposed upon the goods and chattels of an employer in favour of a tribunal to secure vacation pay owing to employer's workmen. This lien has been judicially held to cease to apply to goods sold in the ordinary course of business and accordingly is not a matter of concern. There is, however, a possibility of another lien arising under the Labour Standards Code upon the complaint of a worker followed by an Order of the Tribunal to secure unpaid wages. Any lien of this sort must be discharged by payment prior to delivery.
- (d) The electric utility in Nova Scotia, which is owned by the Province, has a lien against the assets of an

Industry for the last 90 days worth of power supply. It is doubtful that this lien extends to goods sold in the ordinary course of business but the usual practice is to obtain from the power corporation a waiver as of the date of the closing with respect to the rig.

(e) The Mechanics' Lien Act of Nova Scotia is basically designed to provide protection to builders, suppliers and workmen in the building construction business. However, the Act is expressed to create a lien in favour of workmen and material suppliers in connection with the construction of, inter alia, a ship or vessel. Insofar as the legislation attempts to deal with the title of a vessel registered under the Canada Shipping Act, it is undoubtedly ineffective as the federal legislation has priority. The situation with respect to an unregistered vessel, however, is quite different and whether a valid Mechanics Lien can be defeated by registration of the vessel under a foreign flag is an unresolved question. Accordingly, the practice would be to conduct the appropriate searches and if a lien of this nature were found, to require the builder to take the appropriate steps to have the lien lifted.

(f) I promised not to drag taxes into this discussion but I must mention the Provincial Sales Tax. At the moment, there is an exemption from the tax provided with respect to vessels; hence, no concern arises as to tax which might be payable with respect to the vessel. However, there is a provision of the Act which imposes on everyone who sells at retail, an obligation to collect the tax from those to whom he sells and to remit it to the provincial authorities. The amount collected by a seller and not yet remitted is secured by a lien upon all of the seller's property. Depending upon the nature of the business conducted by the shipyard it may well be that there is a lien for some amount on all of its assets. It is not clear whether this lien disappears on transfer of title to goods such as the rig and, unfortunately, in Nova Scotia it is not possible to obtain easily any kind of an up-to-date certificate as to amounts which may be outstanding. As the amount outstanding is usually small compared to the value of the rig, the problem will in practice be ignored, although the solicitor may wish to make a qualification to his opinion.

(g) The final lien to which I want to refer this afternoon is that provided to the National Harbours Board to secure harbour and wharfing fees. As I understand it, they will not let you leave the harbour without paying the fee and accordingly this is a matter which should be seen to at closing.

The final point I wish to mention in this section is not, strictly speaking, a lien, but could be of concern, particularly to an interim lender who is expecting to receive the proceeds of any federal or provincial government grants or subsidies associated with the construction of a vessel. Both the federal and provincial governments have given themselves a right of set-off under their respective income tax acts and other legislation whereby they may deduct from any amount which may otherwise be payable to, say, a shipowner by them any amount which the shipowner owes to either the federal or provincial crown. Accordingly, a party which expects to receive the benefit of any such payment coming from the government would be well advised to make inquiries respecting the state of accounts between, say, the shipowner and both the federal and provincial governments so that the grant or subsidy does not arrive less some unexpected amount.

LAWS AFFECTING THE ABILITY OF THE PARTIES TO CARRY OUT THE TRANSACTION

The corporate capacities of borrowers and lenders and others involved in a ship financing transaction will, for the most part, be governed by the corporate laws of the jurisdiction under which the party in question is incorporated. The usual practice is to obtain copies of the corporate charter and bylaws, appropriate resolutions of Directors (and Shareholders if necessary) authorizing the transaction, evidence of the continued existence and good standing of the party in its home jurisdiction and an opinion of counsel qualified to practice in that jurisdiction that the appropriate corporate proceedings have been taken and that the party has the necessary corporate capacity to carry out its part of the transaction.

A question which always arises when an aspect of a transaction touches upon Nova Scotia is whether one or more of the parties are required to be "qualified to do business" in Nova Scotia in order to be able to enforce their rights under the loan documents.

Unlike some provinces in Canada, there is no obligation that a lender be registered to carry on business here in order to validly register its security. Accordingly, the question of whether any of the parties to the transaction have to be registered in Nova Scotia in order to make their contracts enforceable here will be a matter to be considered on a case by case basis.

Similar considerations apply if one of the parties is a partnership. In that case, registration may be necessary under the Partnerships and Business Names Registration Act. Note that there is considerable doubt as to whether a partnership or limited partnership may be registered as the owner of a vessel under the Canada Shipping Act.

It is unlikely, but possible, that the activities of one or more of the parties to the transaction in Canada may give rise to questions under the Foreign Investment Review Act (Canada).

LAWS HAVING A POSSIBLE BEARING ON THE OPERATION OF THE RIG

Perhaps more than any other group, those attending this conference will be aware of the efforts of Canada and other maritime states to extend the influence of their laws onto the high seas! Beyond the traditional three mile limit, beyond the more recent 12 mile limit, and indeed out to the edge of the Continental Shelf. I do not intend to discuss whether these assertions of jurisdiction are good or bad as a matter of policy. Rather I want to concentrate my remarks briefly on some of the practical problems that can arise.

There are two main federal statutes which are being used to enforce the policy of preferential treatment for Canadians in offshore developments. One is the Foreign Investment Review Act (Canada). The other is the Canada Oil and Gas Act.

There is also, however, evidence that the Government of Canada intends to use all of the statutes under its jurisdiction to bolster the direct controls provided by FIRA and COGA.

The Foreign Investment Review Act is a piece of legislation which gives to the Federal Cabinet the right to permit or deny permission to a non-eligible person to either establish a new business in Canada or take over an existing Canadian business. Broadly speaking, anyone who is not a Canadian citizen or landed immigrant resident in Canada is a non-eligible person. Companies, although Canadian incorporated and Canadian controlled, may very well be "non-eligible" because of a degree of foreign ownership. Non-eligible persons who are already carrying on business in Canada are exempt from the review process if they expand into a fairly narrowly defined area of related activities.

The procedure to obtain approval calls for the provision of information, sometimes in voluminous quantities, to the Foreign Investment Review Agency, which has only the power to make a recommendation to the Minister. The Minister is free to accept or reject the recommendation and, in any event, the full Cabinet makes the decision.

The governing criterion, which the Federal Cabinet is supposed to use, is the concept of "significant benefit to Canada." It would be an understatement to say that that criterion provides the Federal Government with a good deal of discretion.

The Act is well drafted to accomplish its purpose of preventing avoidance. The most frustrating aspect of the Act is the very lengthy delay (up to 9 months or even longer) entailed in the review process. The Act and its administration are the subject of wide debate in Canada both pro and con. Whether changes will result from such debate is impossible to say.

As the Act presently stands, the bottom line is this: any non-eligible person proposing to set up or take over a Canadian business had better be able to demonstrate benefit to Canada in terms of creation of new jobs, the investment of new capital and/or the transfer to Canadians of new technology and the more state-of-the-art the technology, the better.

What impact will this have on rig financing transactions? There recently have been indications that FIRA is thinking of considering rigs working in the Canadian economic zone offshore as being a place in Canada to which employees report for work. If that interpretation is asserted and upheld, then the movement of the rig into Canadian waters by a non-eligible person will be considered the equivalent of the establishment of a new business in Canada and will be subject to the review process with all its attendant delays. Those delays by themselves could be a means of ensuring that only Canadian-owned drill rigs or ships get work in the offshore. As the number of Canadian rigs is limited, the immediate thrust of the FIRA efforts may well be toward jobs for Canadian residents and undertakings to train them to a proper level of familiarity of equipment.

The more immediate concern of offshore operators will be the requirements of the Canada Oil and Gas Act, the latest version of which came into force on the 5th of March, 1982, and which required those holding exploration rights under prior legislation with respect to Canadian offshore areas to negotiate new arrangements with the Federal Government.

The Province of Nova Scotia and Canada have recently put aside the question of which of them owns or has jurisdiction over the Nova Scotian offshore in favour of an Agreement providing for joint administration of the area. This Agreement means that those exploring offshore Nova Scotia will now have one agency with which to deal and the Nova Scotian Provincial and Canadian Federal authorities will sort out any differences between themselves.

The Province of Newfoundland has declined to enter into such a joint administration agreement and accordingly there continue to be two competing regimes and consequent uncertainty for those investing in that offshore area.

The Ministers involved have made no secret of the fact that the legislation is intended to increase Canadian ownership, control, employment and knowhow, and it is accordingly to be expected that the new Agreements with offshore explorers will contain many preferential provisions in favour of Canadian purchasing and employment.

The potential penalties for non-compliance with FIRA and COGA are severe. In addition to monetary penalties, failure to comply with FIRA when required to do so can result in an injunction to cease operations or even an order requiring divestiture of the assets used in offending business.

Under COGA the ultimate penalty will be the denial of the right to continue exploration or development work.

In light of the potentially severe penalties involved in the statutes, it seems to me that it will be important in the future that those who finance rigs for use in Canadian waters or offshore Canada review carefully the FIRA status of the owner and operator of the rig so as to ascertain that it is permitted to operate in the area of intended operations.

With respect to COGA, present indications are that Federal authorities will be requiring increased use of Canadian

personnel and perhaps supplies by those operating in the Canadian offshore. The permit holders will undoubtedly pass these requirements on to the operator in the drilling contract, and lenders will want to assure themselves that the additional burdens involved in training Canadians or in adopting Canadian-preference purchasing policies will not result in an adverse effect on the cashflows from the drilling contracts which are to go in repayment of the lending.

I want to close by emphasizing that the various examples of Canadian law cited are just that -- examples. Undoubtedly each jurisdiction will have its own set of rules and regulations which can or may impact on the structure of a rig financing and I hope these remarks will serve to highlight some of the non-Admiralty matters with which you may be concerned.

DISCUSSION AND QUESTIONS

GORDON BECKER: I have some questions to address to Mr. Spencer. I believe you have mentioned that a typical construction contract for a drilling rig often has a provision in it permitting the purchaser to have an inspector on the premises for the purpose of looking at, approving or disapproving certain aspects of construction. How does the purchaser prevent himself from having such a provision used against him? I had in mind, following delivery, the purchaser asserting that some of the vendor's warranties concerning the rig have been breached. Is not the vendor in good position to say: "well, your inspector approved such and such, and you cannot now turn around and claim that the work was unsatisfactory or that the material was not proper material?"

My next question is this. You mentioned that, increasingly, the somewhat familiar provision that title to the vessel, as it is being constructed passed to the purchaser, is falling into disfavor. This prompts me to ask you whether a typical construction contract for a drilling rig may have a provision that permits the purchaser to withdraw the rig from the vendor's yard, say in case of insolvency or bankruptcy on the part of the vendor.

Lastly, the question about financing relating to financing which involves the bare boat charterer as well as the owner of the drilling rig. We assume, of course, that there will be an assignment of charter hire by the owner to the lending institution, that the bare boat charterer will consent to this assignment. Are there any danger signals for which the bare boat charterer should watch in this situation? For example, would he be wise to insist on a provision that preserves his right to set off from any payments assigned, amounts of money due from the owner to him under the terms of the bare boat charter?

E. S. SPENCER: Taking the first question about the inspector in the builder's yard, or as he is more usually

called, the supervisor. The supervisor under the contract is said to be there to supervise the construction and also to look at the materials which are being used, to see that they are up to the specifications in the building contract. The provisions are usually such that if a supervisor finds that it is not being built properly, or the materials are incorrect, then that matter is raised immediately with the builder, and a decision is taken as to whether the builder is correct or the supervisor is correct. If they cannot agree, then there is usually a provision whereby the classification society decides who is right and who is wrong.

Therefore, mostly anything which is raised by a supervisor will be corrected before the contract is completed. However, I think you probably have a very good point that if the supervisor has been there and he has allowed something to go wrong or something to be incorporated which he said was all right, then subsequently, I think it is very unlikely that the purchaser would have good cause of action against the builder.

GORDON BECKER: Is there anything that the purchaser can do to protect himself against this consequence?

E. S. SPENCER: Well, the supervisor is there as his agent and, therefore, he is virtually bound by what his agent is doing. Either he gets a good chap there to be a supervisor or else he sacks him if he does not do what he is told to do. I do not think that he can have his cake and eat it.

The second question was concerning a building contract, under which parts of the rig passed to the purchaser as he paid the various instalments on the purchase price. There are provisions written into a contract such as that, which allow the purchaser to go in and use the facilities of the builder to finish the vessel or finish the rig.

That was probably fine in the days when ships were being built of wood and you need a few shipwrights to finish the work, but in the day of the modern ship, it is really quite impractical. There is, of course, a provision such as you suggested, to allow the purchaser to take away his property if the builder becomes insolvent. The problem with that, of course, is that it may not be in a state where he can take it away, or liquidator or receiver, may say it is his or the company's. I think those are two of the main reasons why that type of contract is now falling out of favor.

As for the third question regarding the assignment of charter hire under the bare boat charter. I was talking about the financial bare boat or financial demise charter where, except at the end of the lease period, virtually all payments go one way, that is, from the charterer to the owner. I cannot think of any provision in that type of charter where the charterer is going to get any money until, under the terms of the charter, the rig is sold and the sale proceeds are divided as they have been agreed in the contract.

GORDON BECKER: Supposing the owner did not keep up the vessel's registry properly and the vessel became forfeited? That would be a situation where the charterer might well feel that to keep on that charter hire would be an unfair burden for him to bear.

E. S. SPENCER: I suppose that in that type of contract there are only two main obligations on the owner. The first is that he should give to the charterer the quiet enjoyment of the vessel during the charter period so long as the charterer performs his obligations. The other is the one, that you have highlighted, is that the registration should be kept up. Certainly, once under the British Shipping Register, you do not really have to do anything else during the time that it is there, which would make it come off the register, because all things such as keeping it in the right classification are the obligations of the charterer under the charter party. I suppose that is one of the main reasons why it could be taken off the register, because it does not fulfill the requirements of the Department of Transport surveyors. I would agree with you, theoretically, that is one possibility, but it is very unlikely.

GORDON BECKER: Thank you.

WYLIE SPICER: I would like to ask Ashton O'Dwyer a question. I am wondering what the relationship is under American law between a claim under the Jones Act by a seaman and rights to entitle him to worker's compensation?

ASHTON O'DWYER: Well, if a seaman is covered by the Jones Act he actually has two remedies against his employer. One is the remedy of maintenance and cure which is awarded to the seaman who was injured in the service of the ship, without regard to fault on his employer's part, and without regard to unseaworthiness on the part of the vessel. This maintenance remedy is an entitlement to a daily allowance which is intended to compensate the seaman for the value of the food and lodging that he would have received aboard the ship had he not been injured.

The rate of maintenance today is an issue that is being litigated all over the country. Until the last year and a half or two years, the rate had been fixed at \$8.00 a day, through custom really, and the fact that contracts with unions and ship owners arbitrarily fixed this \$8.00 rate. In today's economy with what things cost and what lodging costs, \$8.00 is simply unrealistic. At least, from the plaintiff's perspective.

Defense lawyers like myself have been able to demonstrate through motion practice that you can, when you are feeding a large group of men, live reasonably well on \$8.00 a day. Unfortunately, none of the judges before whom this has been litigated in New Orleans has bought it. This has been proven through the testimony of economists, who have studied what food

and lodging cost when the \$8.00 a day rate came into vogue. Plaintiffs have had their economists project that same cost forward. I believe the highest daily maintenance award so far is in the neighborhood of \$20.00 a day.

Part in parcel, with the maintenance remedy, is the remedy of cure, which is the seaman's entitlement to medical expenses. These are due without regard to fault, if he is injured in the service of the ship, until he reaches a point of maximum medical cure. That is, where he can no longer respond to treatment or until such a time as it is determined that his disease is incurable. For instance, what happens to the poor fellow who is suffering from cancer? He was stricken in the service of a ship. Maybe he worked on a chemical carrier, and his condition is terminal. The law says you cannot expect the shipowner to continue to pay this man until he dies. Consequently, there is the nonfault remedy of maintenance and cure and there is the fault remedy of damages. You do not offset the man's damages on what he received by way of maintenance and cure.

WYLIE SPICER: But, you can bring an action separate and apart from recovery of Worker's Compensation?

ASHTON O'DWYER: Yes, the seaman has no Worker's Compensation remedy as such. He has the right to maintenance and cure and the right to damages if his employer is at fault if the vessel was unseaworthy.

EDGAR GOLD: Mr Chairman, I would like to try and return for a few moments to the question of definition which you have written eloquently about, and several of the speakers today have already referred to. I am wondering whether this dilemma will not eventually be solved by the CMI convention which is, at present, being worked upon by IMO, the International Convention of Offshore Mobile Craft which was produced in draft form during the Rio de Janeiro meeting of the CMI.

The discussion there showed that these craft are not really ships the way we know them. No more than the helicopter within the Jones Act parameters. It is not so much looks, but it is also the operation. I think that is the real key. These crafts are not being operated as ships.

The draft convention defines these craft as: "any marine structure of whatever nature not permanently fixed into the seabed which (a) is capable of moving or being moved whilst floating in or on water, whether or not attached to the seabed during operations, and (b) is used or intended for use in the exploration and exploitation, processing, transport or storage of the mineral resources of the sea-bed or its subsoil or in ancillary activities." It would seem to me that a completely new regime for these structures, because I refuse to call them ships, will perhaps solve this dilemma with which we have been faced.

WYLIE SPICER: I wonder if you have any confidence that the Canadian government is likely to adopt that convention?

EDGAR GOLD: Well, that is an interesting question, Wylie. The only time the Canadian position has been tested was during the MARPOL discussions in 1973 at IMCO. There was a very strong discussion between several of the Maritime countries on one side and Canada on the other side. Canada argued that these structures should not be classified as ships against the very strong opposition of some of the Maritime countries. So, it seems that the Canadian position going back almost a decade is that these are extra-territorial craft rather than ships in a normal manner.

With respect to the question of limitation of liability, as a precondition to operating in the offshore, many of the oil companies enter into operating agreements with the government which provide strict liability provisions with respect to things like pollution. Whether or not those operating agreements impinge on the rights of the owners or operators of rigs to base defenses on the basis of limitation of liability is not entirely clear to me.

Nevertheless, there is a very extensive regulatory regime in this country which does attempt to provide strict liability provisions in some cases, by way of statute in the North, but in other cases by way of operating agreements, which are required for offshore operation.

And, on behalf of the organizers of this particular session I would like to thank all of you for coming.

PART IX

OFFSHORE PETROLEUM:
CURRENT ISSUES AND DEVELOPMENTS
IN THE NORTH ATLANTIC

INTRODUCTORY REMARKS

Panel Chairman Lewis M. Alexander
U.S. Department of State
and University of Rhode Island

This panel was put together by Richard Young, the former presiding officer of the Law of the Sea Institute, who unfortunately could not be here this morning. In his absence it is my pleasure to introduce our eminent speakers this morning. First, we shall hear four presentations on the emerging regulatory regimes for offshore petroleum production. After the coffee break, the two remaining speakers will discuss the problems related to the definition of the continental shelf.

The first speaker is Ian Townsend Gault, who studied law at Dundee University in Scotland and has done graduate work at Cambridge University. He is currently Research Associate with the Canadian Institute of Resources Law in Calgary and also teaches international law at the University of Calgary. He has written on marine and other resource problems in international and municipal law and is directing the Canadian Continental Shelf Law Project at Calgary.

He will be followed by John Garrett, Manager, Business Research Group, of Gulf Oil Exploration and Production Company in Houston, Texas. He is trained both in petroleum geology and energy economics and has spent 18 years in Venezuela doing oil work. Since 1975 he has served as a member of the U.S. Advisory Committee on the Law of the Sea.

The third paper is by Jonathan Charney, Professor of Law at Vanderbilt University School of Law. Professor Charney has published a large number of studies in the law of the sea field and related areas, and is particularly noted for his expertise in ocean boundary questions.

The fourth speaker is Paul Yuan, who holds an LL.B. from Suchow University Department of Law and a Master of Comparative Law from Louisiana State University. He has been a legal researcher and adviser in China for the past 30 years, most recently with the Chinese Academy of Social Sciences, and is currently Visiting Research Fellow at the Institute for Marine and Coastal Studies at the University of Southern California in Los Angeles.

After the coffee break, the first of our two remaining speakers will be Vince McKelvey, who has served a distinguished career as geologist with the U.S. Geological Survey, and for a number of years as its Director. He has also been the U.S. representative to the Economic and Technical Sub-committee of the U.N. Seabed Committee and a senior scientific adviser to the U.S. Law of the Sea delegation.

The final speaker on this morning's panel will be Donald Crosby. Dr. Crosby holds an M.S. and a Ph.D. in petroleum geology from Stanford University and has been in service with the federal government of Canada since 1965. He was appointed Director General within the Canadian Department of Energy,

Mines, and Resources in 1978, and three years later he became Deputy Administrator of the Canada Oil and Gas Lands Administration, when it was set up by the Canadian government to administer oil and gas matters both onshore and offshore, including the Arctic and North Atlantic regions. Recently he was appointed Science Counselor of the Canadian High Commission in London.

THE IMPACT OF OFFSHORE PETROLEUM REGIMES ON OTHER SEA USERS:
THE NORTH SEA AND NORTH AMERICA

Ian Townsend Gault
Canadian Institute of Resources Law
University of Calgary

INTRODUCTION

The importance of offshore hydrocarbon resources to the petroleum industry and to coastal states may be measured by the growing intensity of offshore exploration and production activities around the world. For some countries, bereft of landbased hydrocarbons, the offshore holds the promise of energy self-sufficiency and economic well-being or recovery. For others it is merely the icing on an otherwise substantial cake.

States in the former category have tended to adopt policies which encourage offshore development. The high political profile enjoyed by these operations has tended to displace other concerns. Among the likely casualties are existing long-range plans for coastal areas onshore, the marine environment (but not necessarily from oil pollution), and other users of the sea. This paper examines some aspects of the municipal legal regimes for offshore petroleum activities developed by the United Kingdom, Norway and Canada, and also refers to comparable experiences in the United States.

This is, to some extent, a comparative exercise, and it is hoped that the comparative approach will illuminate certain policy trends in the offshore, especially with respect to the conflicting uses of the seas. This topic is clearly ripe for examination, or re-examination, especially in view of the proposed oil and gas activities off the east coast of Canada and the United States. The prospect is, to some extent, less than attractive to other sea users, or those dwelling in the vicinity of the coast. While there may be a consensus in favour of hydrocarbon development in frontier areas as alternatives to depleting traditional sources, is it worth risking massive oil pollution, disruption of the fishery, degradation of the marine environment and the hazards posed to vessels by the presence of installations and operational debris?

The case for an examination of the situation in Canada is especially strong. Just as the international community has completed a comprehensive review of the law of the sea at UNCLOS III, Canada is revising her legislation and policy pertaining to offshore hydrocarbon development. An enthusiastic participant at UNCLOS III and a major coastal state, Canada can draw on an unparalleled body of legal principle and state practice in the implementation of an operational regime within the conceptual framework of the U.N. Convention on the Law of the Sea.

Comparative exercises of this kind are currently popular in Canada. A long-established oil producer from conventional, landbased sources, Canada is now actively encouraging

exploration and development in the Arctic and the offshore. In fashioning the new licensing regime, the government appears to have been influenced by developments in the North Sea. It is clear that the government of Newfoundland was much influenced by Norwegian law and policy with respect to offshore licensing, management, and policy. The government's legislative proposals sparked off a lively debate with the oil industry, in the course of which parallels between the proposed measure and equivalent legislation in other countries were drawn -- not always wisely or accurately [1]. It is perhaps useful to emphasize the dangers of unwise comparison, as well as the lessons which could be learned. But lessons from the experience of other countries have not always been well learned, or heeded.

Canada received an unpleasant reminder of this following the sinking of the Ocean Ranger in February 1982. The U.S. inquiry heard evidence which suggested that there was some uncertainty who has ultimate authority on board the installation -- the "captain" or the drilling superintendent. But the inquiry into the sinking of the British oil rig Sea Gem in 1965 found that this uncertainty contributed in no small measure to that disaster.

Shortly after the Ocean Ranger disaster a senior Canadian government official, in the course of an interview for the Canadian Broadcasting Corporation, claimed that Canada always learned what it could from the experience of other countries, effecting changes in the domestic legal regime in accordance with shortcomings revealed by developments elsewhere. He also announced that he had recently ordered offshore operators to increase the number of survival suits and lifeboats and these instructions, he claimed, brought Canadian safety standards up to those of Norway.

There are two comments which can be made here. First, the claim that Canada learns from the experience of other countries active in the offshore is scarcely consistent with the fact that the Canadian regulations failed to make the designation of ultimate responsibility a requirement singled out by the British inquiry as being of prime importance for safety on such installations. Second, Canadians frequently invoke the Norwegian regulations, which, it is generally agreed, are strenuous in their demands. But the claim to equality with Norwegian safety standards is open to doubt.

The current surge of interest in the potential of the offshore can be explained by reference to the issue of mineral jurisdiction under the Canadian constitution. Oil and gas within a province is subject to provincial jurisdiction. The federal government claims jurisdiction over the resources of the Yukon Territory and the Northwest Territories, and the Canadian continental margin: the "Canada Lands". This jurisdiction is contested on a number of fronts. This paper will concentrate on the federal regime, which will in any event prevail over most of the Canadian offshore. Moreover, jurisdiction in the extensive Arctic offshore is clearly federal, and Nova Scotia has recently agreed on joint jurisdiction and management with the federal authorities in the offshore adjacent to it.

DEVELOPMENT OF THE NORTH SEA PETROLEUM REGIMES

The United States was the first country to begin offshore petroleum activities, as early as 1896. Experiences in Lake Maracaibo, Venezuela, in the 1920's and in shallow parts of the Gulf of Mexico contributed to the industry's growing fund of knowledge, so that by the late 1940's drilling in the Gulf was taking place out of sight of land. The development of drilling rigs which did not require to be placed on the seabed opened up enormous areas of the offshore. Without that technological development offshore operations in the North Sea could never have been commenced.

The discovery of a large natural gas field, part onshore and part offshore, in the Netherlands near Groningen stimulated the interest of the oil industry in the hydrocarbon production potential of the North Sea. Preliminary exploration results were sufficiently encouraging, and between 1963 and 1965 the United Kingdom and Norway, the countries with the largest offshore areas in the region, had implemented a licensing regime for offshore petroleum and concluded a continental shelf boundary delimitation agreement.

The U.K. and Norway have retained their pre-eminent position as European oil producers, but the financial viability of their operations remains vulnerable to factors such as the world price of oil. The rise in OPEC oil prices following the Yom Kippur War transformed several North Sea fields from marginal prospects to commercially significant discoveries.

The price rise, and the resultant raising of the political profile of oil, has had its impact on domestic legislation. Britain and Norway knew they could only attract interest in their offshore if the terms on offer guaranteed sufficient return to licensees, but yet did not appear to represent a challenge to the OPEC countries [2]. However, the price rise gave governments a scant of the money available from oil revenues, and changes to the licensing terms were promptly effected. The process was not unlike the implementation of Canada's National Energy Program, and promulgation of the Canada Oil and Gas Act.

The two states adopted a somewhat flexible mode for the promulgation of the licensing regime. Britain already had such a regime for onshore petroleum; the Petroleum (Production) Act 1954 [3], pursuant to which regulations were issued in the form of model clauses to be attached to production licences [4]. But this regime was untested, because early exploration onshore was disappointing, and supplies of crude oil were readily available from the Middle East, so that few licenses were sought and virtually no oil produced. The Continental Shelf Act 1964 applied this regime to the continental shelf, vesting the rights exercisable over that area in the Crown [5]. The Petroleum (Production) Regulations, promulgated in 1966 [6], laid out two sets of regulations: one for onshore, the other for offshore activities. This practice has been followed in succeeding sets of regulations.

Norway had no petroleum law before 1963. An enabling Act was promulgated that year [7] after Norway had made a formal declaration of her rights over the resources of the shelf in line with Article 2 of the Convention on the Continental Shelf [8]. Regulations instituting the licensing system were introduced in 1965 and revised in 1972 [9], but the whole regime is to be replaced by a Petroleum Act, drafts of which are currently under discussion in Norway.

The licensing systems of both countries have been flexible, admitting of comparatively easy amendment. The Norwegian 1963 Act is sufficiently broad to permit a broad range of regulations to be issued pursuant to it, but the nature of offshore activities has placed significant demands on legislators, especially if national goals of close management and supervision are to be complied with. To some extent it was inevitable that the law would lag behind technological developments, and the problems, especially disasters, would be the most effective catalysts for reform. There have been few disasters, but many persistent problems. The marine environment has not suffered unduly from oil pollution, but it has been despoiled by operational debris littering the seabed, by accident or design [10]. Until recently, little attention was paid to this rather undramatic problem. Similarly, while disasters such as the loss of the Alexander Kielland facility have focused attention on safety and other issues, the steady attrition rate among offshore workers and divers and the problem of raising training and safety standards have received rather less attention [11]. When the political economy of oil activities dictates speedy exploitation, there is some impatience in government circles with proposals which conflict with this aim. It was, therefore, almost inevitable that other sea users should find their problems largely disregarded.

The other sea users in the North Sea have had little difficulty in identifying the political implications of offshore oil production or in anticipating its proliferation in response to government policies. The legitimacy of their concern has been acknowledged up to a point both in international and domestic law, but how has their interest been protected?

The Convention on the Continental Shelf, ratified by the U.K. in 1964 and by Norway in 1971, enjoins states not to permit operations on the shelf to interfere unreasonably with fishing and navigation [12]. Virtually the same wording appears in the UK Model Clauses [13], and the Norwegian Regulations [14]. It may be said that the impact of the oil industry was to some extent foreseeable, despite the lack of planning, but has that impact been "unreasonable"? To what extent has it interfered -- unreasonably or otherwise -- with other users of the seas?

DEVELOPMENT OF THE CANADIAN FEDERAL PETROLEUM REGIME: PROTECTION OF FISHERMEN'S INTERESTS

Exploration for petroleum in the Canadian offshore began in 1958, and drilling commenced off the East Coast in the following

year. Exploration was also taking place on certain Canadian Arctic Islands, and was to move offshore some years later.

The licensing regime had been amended in 1961 [15] following extensive consultations with industry. Along with the fiscal regime, it was designed to attract companies to the "frontier" areas. These Regulations were amended in 1977 [16], and have now been replaced by a regime promulgated by the Canada Oil and Gas Act [17], which was proclaimed in force in March 1982.

The Act implements a new licensing regime, one marked by extensive government control over all aspects of the licensee's operations. The policy background to the Act was provided by the National Energy Program of October 1982, which confirmed Canada's alignment with countries unable to accept the freedom of action enjoyed by leaseholders on the U.S. outer continental shelf, for example. Since 1977 Canada has claimed a 200 nautical mile fishing zone, and the Canada Oil and Gas Act applies to the edge of the Canadian continental margin, or to 200 nautical miles, whichever is the greater, a domestic rendition of Article 76 of the Law of the Sea Convention. Canada, therefore, exercises resource jurisdiction over the entire offshore area permitted in international law. However, the National Energy Program calls for a sustained effort in frontier areas with a view to the goal of energy self-sufficiency and reduction of reliance on imports from abroad.

In these circumstances it may well be asked how Canadian fishermen are likely to fare within the new offshore zones of oil development. The East Coast fishery is in a depressed state, and it has taken time for fishermen to make contact with government and the oil industry on these matters. When the Canada Oil and Gas Act was under consideration by Parliamentary committees, representatives of the fishing industry pressed for consideration of their interests. Government was urged to ensure that a compensation scheme for damage caused by debris was instituted [18]. As part of their Environmental Impact Statement or Development Plan for discoveries off the East Coast, Mobil Oil Canada Ltd. will be required to address issues of importance to the fishermen, including the issue of compensation for damage caused by non-attributable debris and for loss of access to fishing grounds [19].

The amendments to the Oil and Gas Production and Conservation Act [20] by the Canada Oil and Gas Act render operators liable without proof of fault or negligence for damage caused by debris up to limits to be set by the Minister [21]. This does not address one of the major problems encountered by North Sea fishermen, identifying the responsible party when damage is sustained, for not all such debris is labelled, nor will the location of an incident be conclusive proof of the identity of the dumper.

ALTERNATIVE COMPENSATION ARRANGEMENTS

Three solutions to the problem of compensation may be considered for adoption in the Canadian offshore: those developed in the United States, Norway, and the United Kingdom.

United States

The solution was the establishment of the Federal Fishermen's Contingency Fund. The Fund was set up to compensate U.S. commercial fishermen for damage sustained in waters superjacent to the U.S. Outer Continental Shelf as a result of exploration, development and production of hydrocarbons. The Fund is constituted by sums levied on holders of offshore licences, permits, or leases, and is administered by the U.S. federal government pursuant to Regulations published in the Federal Register. Herein lies a problem, perhaps the most serious problem when assessing the efficacy of the Fund: how to ensure the validity of each and every claim. The early procedures for assessing claims were cumbersome, costly, and time-consuming. Part of the procedure required a hearing before an administrative law judge. The then Administrator of the Fund informed the writer in 1981 that the processing time for a claim was some five months on average, with costs on average amounting to five times the amount of a claim. For the fishermen this was unacceptable, but it was felt that safeguards were required for the disbursement of public money. As with many such funds, a mere fraction of the amount accumulated has been disbursed.

Recent amendments have simplified both the procedure and the claim form. It remains to be seen how successful these reforms will be [22].

Norway

The Norwegian scheme [23] is government-administered and financed from the public purse (oil revenues), because the Norwegian government considers that its "take" from the offshore is such that compensating victims of oil activity is a national responsibility. There is therefore no "fund". The scheme was set up following strident representations from the fishermen who bitterly resented the preference given to the oil industry, especially as non-attributable damage sustained by them had become an increasingly serious financial problem. Administration is more informal than with the U.S. scheme. Only Norwegian commercial fishermen can claim, but the damage may be sustained anywhere on the continental shelf of western Europe.

United Kingdom

Perhaps the most informal scheme is that set up by the United Kingdom Offshore Operators Association (UKOOA). Established in 1975, again following bitter complaints to government and industry from the fishermen, the scheme is wholly administered by a Management Committee comprising members from fishermen's organizations alone, especially the Scottish

Fishermen's Federation. The Committee is therefore well placed to assess the validity of claims, which are submitted by way of a very simple claim form. UKOOA finances the scheme; the Committee submits a request for imprests for the coming year, but remains solely responsible for the disbursement of these funds. UK fishermen can claim for damage to fishing gear, vessels, loss of catch, loss of fishing time, but not for loss of access. Damage must be sustained on the UK shelf only.

Apart from relatively minor problems, and the continuing pressure to raise the limits for claims, this scheme appears popular with both industries, and with the British government, which was anxious to play no part whatever. It is a scheme that runs on trust -- trust that the fishermen will not abuse the informality of the system, and trust that individual operators will not deny liability automatically and refer each claim to the scheme. (Claims are brought against an individual operator in the first instance whenever it appears at least possible that the damage in question was caused by debris for which he is responsible). On the whole, the UKOOA scheme appears to recommend itself on the basis of efficiency (since administrative costs are nominal), efficacy, and accessibility.

LOSS OF ACCESS

Claims for loss of access to fishing grounds have been resisted by industry and government in all four jurisdictions discussed here. Loss of access is a physical deprivation of access to traditional fishing areas due to the presence of rigs, pipelines or other facilities. It should be remembered that most facilities are protected by a safety zone of 500 metre radius within which fishing vessels may not come, unless in distress. The oil companies claim that their operations are lawful, and in pursuance of government policy. Government claims that the presence of the oil industry in the offshore ~~part~~ ~~is~~ does not violate any existing "right" vested in the fishermen.

CONCLUSIONS

Meeting claims brought by fishermen resulting from oil-related non-attributable damage has obvious political attractions for the oil industry. The costs involved, compared to the expenditures on offshore operations, are minimal. It is suggested here that this is not an area where government should complicate the issue by participation. A solution on the British (UKOOA) model is to be recommended.

Solution of one problem should not obscure the extent of the still unresolved problem of efficient management in the offshore. Responsibility for the resolution of problems of conflicting uses of the seas is clearly that of government. Unfortunately, it is probable that the political economy of offshore oil will relegate these issues to the bottom of the list of priorities.

NOTES

1. Rowland J. Harrison and Ian Townsend Gault, "Bill C-48: A Framework for Comparative Analysis", Canadian Institute of Resources Law 1981. The document was presented to the House of Commons Committee on National Resources and Public Works (Proceedings and Evidence of the Committee, Issue 23, February 3, 1981).
2. For a discussion of the evolution of the two legal regimes see Terrence Daintith and Ian Gault, "Pact Sunt Servanda, and the Licensing and Taxation of North Sea Oil Production", 8 Cambrian Law Review 27 (1977).
3. 24 & 25 Geo. V, c. 36.
4. Petroleum (Production) Regulations, 1935, S.R. & O., 1935, No. 426.
5. Continental Shelf Act 1964, C.29, s. 1(3) et. seq.
6. Petroleum (Production) Regulations, 1966, S.I. 1966/898. These Regulations have been superseded and substantially amended.
7. Act No. 12 of June 21, 1963, relating to Exploration for and Exploitation of Submarine Natural Resources.
8. Royal Decree of May 31, 1963.
9. Royal Decree of December 12, 1972 relating to Exploration for and Exploitation of Petroleum in the Seabed and Substrata of the Norwegian Continental Shelf (amended June 25, 1976). This Decree is currently in force.
10. Mr. John Goodlad, Secretary of the Shetland Fishermen's Association, following renewed complaints in 1982, stated that "there are now large areas adjacent to the pipelines where large quantities of discarded oil rig debris -- chains, wires, anchors and other items, have been left on the seabed." (The Times, May 11, 1982). The Norwegian Petroleum Directorate conducted a full scale investigation of the seabed near an important petroleum producing area and recovered a vast amount of debris -- some of it left by fishermen, some from the war, but most resulting from oil related activities.
11. See W.G. Carson, The Other Price of Britain's Oil, (1982).
12. Convention on the Continental Shelf, Article 5(1). The French government considered that interference with the acquired rights of fishermen in waters superjacent to the shelf gave rise to compensation (statement deposited on ratification, June 14, 1965). On ratifying the Convention on February 6, 1970, Canada objected inter alia to this statement.
13. Petroleum (Production) Regulations 1976 (S.I. 1976/1129), Schedule 5, Clause 23.
14. 1972 Royal Decree S. 39.
15. Canada Oil and Gas Land Regulations, SOR/61-253 as amended.
16. Canada Oil and Gas Land Regulations, 1977, C.R.C. 1978, c. 1518.
17. S.C. 1980-81-82, c. 81.

18. See evidence of Mr. Alan Billard, Executive Director, Eastern Fishermen's Federation, to the House of Commons Committee on National Resources and Public Works -- Evidence and Proceedings on Bill C-48, Issue 30, February 26, 1981.
19. The "Guidelines for the Preparation of an Environmental Impact Statement for Potential Oil Production on the Northeast Grand Banks", issued by the Federal Environmental Assessment Review Office in July 1980 focuses, inter alia, on issues arising out of damage caused by possible oil pollution. It is significant that the Newfoundland government's "Guidelines for the Approval of a Hibernia Development Plan" are rather more specific: the province is perhaps more aware of the range of problems likely to be encountered by its fishermen, and has monitored developments in Norway closely. The Guidelines call for the Operator of the Hibernia oilfield (Mobil Oil Canada, Ltd.) to submit proposals for training replacements for industries who lose personnel to the oil industry, and for the establishment of a scheme to compensate fishermen for loss of catch, gear, fishing time, damage to vessels and equipment, and loss of access to fishing grounds. The federal and provincial processes duplicate one another to some extent, a consequence of the failure to resolve the jurisdictional dispute.
20. R.S.C. 1970, c. 0-4, as amended.
21. ibid. s. 19.
22. The Fund was established pursuant to Title IV of the Outer Continental Shelf Lands Act Amendment of 1978, U.S.C., s. 1841 et. seq.; Public Law 95-372, ss. 401-407, September 18, 1978. The Federal Fishermen's Contingency Fund, Rules and Regulations, Federal Register, July 2, 1980, ss. 296.1. The amendments were effected by Public Law 97-212, June 30, 1982, and Federal Register, vol. 47, no. 211, November 1, 1982.
23. Established by Royal Decree of February 7, 1981.

HYDROCARBONS ON THE CONTINENTAL MARGINS:
SOME OF THE ISSUES ADDRESSED IN THE
UNCLOS III NEGOTIATIONS

John Norton Garrett
Gulf Oil Exploration & Production Company

Geologists throughout the world recognize that the earth's submerged continental margins may contain substantial, but as yet largely undiscovered, resources of conventional petroleum and natural gas. Such potential deposits may occur not only on the continental shelves, where activity to date has proved significant hydrocarbon accumulations, but also on the deeper continental slopes and rises.

In terms of actual production, offshore petroleum deposits throughout the world in 1980 yielded about 14 million barrels per day, or 23 percent of the total world crude oil production of about 60 million barrels per day. Adding natural gas production of over 10 TCF from the offshore, we discover that total offshore hydrocarbon production in 1980 amounted to nearly 20 million barrels per day of crude oil energy equivalent. The value of this energy exceeded 200 billion U.S. dollars.

Proved crude oil reserves are those quantities of crude oil that have been documented through exploratory and appraisal drilling and which can be extracted economically under existing cost/price relationships. Of the world's total proved reserves of about 670 billion barrels [1], I would judge that approximately 150 billion barrels, or between 20 and 25 percent of the total are offshore. Further, an estimate [2] has been made that the total undiscovered recoverable conventional petroleum resources throughout the world amount to nearly one trillion barrels with the offshore share amounting to about 400 billion barrels. These latter estimates of unfound resources are useful in an order of magnitude sense at best. In this respect, I will stress that recoverable oil quantities only are measurable after a deposit has been confirmed by the drill and the economics of its producibility ascertained through reservoir performance analyses. Nonetheless, these resource estimates do demonstrate the very considerable potential that remains to be discovered offshore.

With reference to the distribution of the ultimately recoverable offshore petroleum potential, it has been estimated [3] that between 98 and 100 percent of these resources lie within the seaward edge of the continental rise, and 80 to 95 percent are within 200 nautical miles of shore. As to water depth, roughly two-thirds of this potential is expected to occur on the continental shelf and within the 200 meter isobath.

Because of the crucial economic importance of energy, the delineation of those areas of the submerged continental margins that will fall under coastal state jurisdiction has been critical to the UNCLOS III treaty negotiations. Another major concern is whether revenues from hydrocarbon production seaward of the 200 mile Exclusive Economic Zone should be shared with the poorer nations of the world.

Historically, petroleum operations have been conducted offshore since the period between World Wars I and II. Two examples of these incipient offshore operations are the Lake Maracaibo Fields of Venezuela and the Soviet Union's Baku Field in the Caspian Sea. It was not until 1945, however, when President Truman proclaimed that the United States had the exclusive right to explore for and produce the mineral resources found on its continental shelf far beyond the three mile territorial sea, that offshore activities in the open sea (in this case the Gulf of Mexico) were conducted. By 1958, at the first United Nations Conference on the Law of the Sea in Geneva, the principle was established that coastal states had the right to exploit minerals on or under the continental shelf seaward to a water depth of 200 meters, or beyond to the limits of exploitability in adjacent waters [4].

As recently as 15 years ago, the capability to conduct petroleum-producing operations in waters exceeding 100 meters in depth had not been developed. Presently, because of experience gained in the Gulf of Mexico, the North Sea, and most recently the Eastern Canadian Offshore, we now have the ability to conduct conventional development operations (i.e., with platform installations) in waters as deep as 500 meters. Moreover, industry is of the opinion that sea floor producing and gathering systems can be installed that will permit exploitation activities in waters exceeding 1,000 meters in depth within the next few years.

A concept that has received implicit recognition at the Third United Nations Conference on the Law of the Sea is that coastal states have exclusive jurisdiction over both living and non-living resources to a distance of 200 nautical miles from their shores. For many countries, the 200 mile Exclusive Economic Zone includes the entire submerged margin. However, some coastal states have continental margins that extend considerably beyond 200 nautical miles. Countries whose margins extend beyond 200 miles are referred to as "broad margin states". Argentina, Australia, Brazil, Canada, India, New Zealand, the United Kingdom, the United States and some West African countries are examples of broad margin states. These states wished to retain control over prospective hydrocarbon deposits off their shores. Accordingly, UNCLOS III negotiators developed formulae for delimiting that portion of the continental margin seaward of the 200 mile Exclusive Economic Zone that would be under coastal state jurisdiction for resource purposes.

The "margin jurisdiction" provision, as embodied in Article 76 of the Draft Convention, is a rather complicated provision which incorporates geomorphological and petrological concepts as well as linear and bathymetric criteria. Since Messrs. Crosby and McKelvey will deal with these continental shelf issues in detail later this morning, I will only touch on the main features of Article 76.

Article 76 provides that, beyond 200 nautical miles, the coastal state will have jurisdiction over the margin to a

distance of 60 nautical miles from the distance of 60 nautical miles from the foot of the continental slope or to a distance -- i.e., a line connecting a series of points -- where the ratio of sediment thickness to the seaward distance from the foot of the slope is one-one hundredth (0.01). For simplicity of description of this "thickness of sediments" test, imagine that the sediments on the continental rise are 6,080 feet thick (i.e., one nautical mile thick) at a point 100 nautical miles from the foot of the slope. That distance, then, will mark the outermost limit of coastal state jurisdiction.

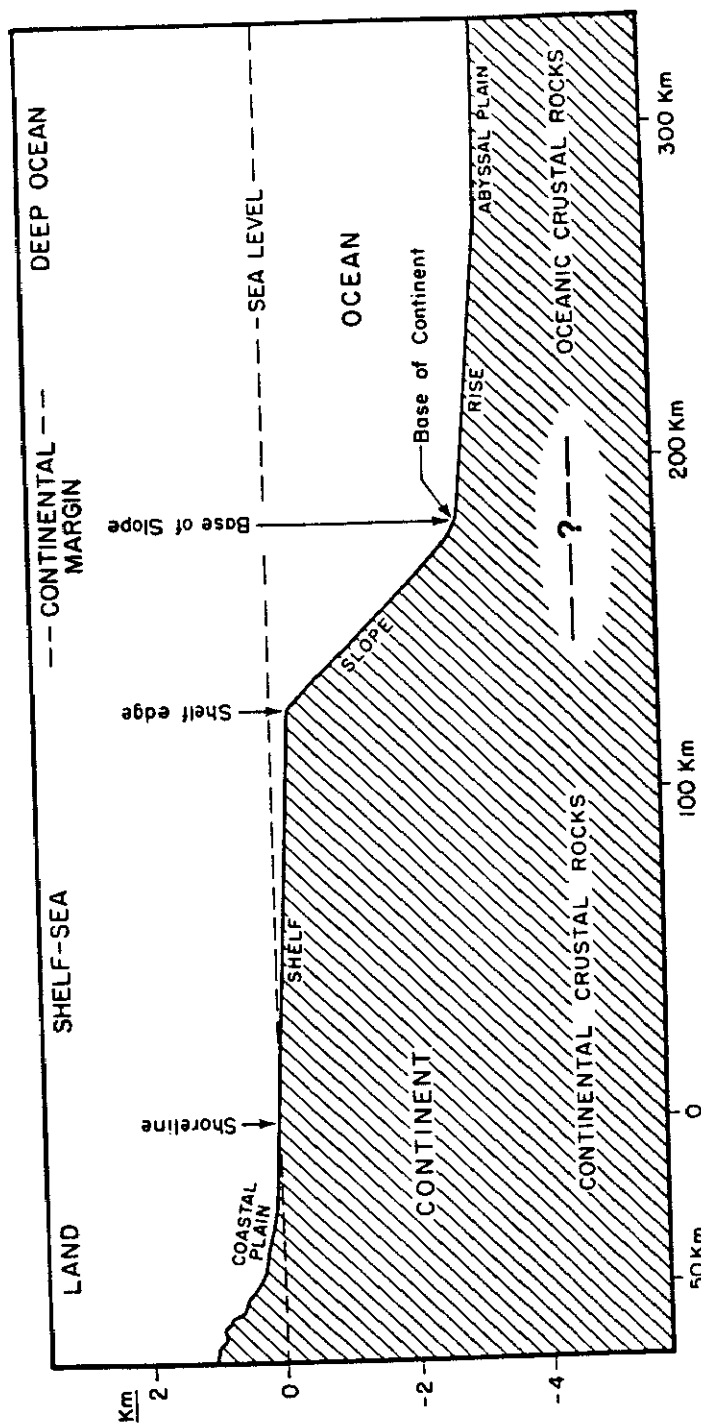
In addition to criteria related to the foot of the continental slope which I have cited, Article 76 further provides that the outer limits of the continental shelf shall not exceed either 350 nautical miles from shore or 100 nautical miles seaward of the 2,500 meter isobath.

The concept of sharing revenues from non-living resources extracted seaward from the 200 mile Exclusive Economic Zone was first discussed in detail at the 1975 Geneva session of UNCLOS III. Understandably, no state would willingly cede jurisdiction over any portion of its margin that might contain significant mineral resources. Accordingly, negotiators from the broad margin states, recognizing that under a universally acceptable treaty, retention of jurisdiction over the hydrocarbon potential throughout the entirety of their margins would require some political accommodation, proposed different revenue sharing schemes. The proposal that ultimately was adopted was developed by the United States delegation in 1975 and is included in the Draft Convention as Article 82.

Essentially, Article 82 provides that payments and contributions from operations beyond the 200 mile Exclusive Economic Zone will be made annually with respect to all production at a site commencing after the first five years of production at that site. For the sixth year the rate of payment, or contribution, shall be 1 percent of the value of the production at that site and the rate shall increase by 1 percent for each subsequent year until the 12th year when it reaches 7 percent; thereafter, it will remain at 7 percent until field depletion. Any resources used in the exploitation process shall be exonerated from the payments formula. Further, as stated in the Draft Convention, any developing country that is a net importer of a mineral resource produced from its continental margin shall be exempt from the payments obligation.

Another concept of revenue sharing that was discussed among certain delegations at Geneva in 1975 was a "profit sharing" formula, whereby a certain percentage of the profits (i.e., the difference between the market value of a mineral and the costs associated with its extraction) would be shared among developing countries.

Of these two formulae, the revenue sharing concept was preferred over the profit sharing idea for several reasons, among which were:



(VERTICAL EXAGGERATION 20X)

NOTE: 1 Km = 0.62 statute miles.

Geomorphic Features of the Continental Margin.
 From "Oceans Petroleum Resources," National Petroleum Council, March, 1975.

- A revenue payment scheme can be applied uniformly to all qualifying mineral production throughout the world on the basis of established commodity values.
- Because of philosophical differences regarding economic theory, there are nations that might not recognize -- or account for -- the existence of any profit on the extraction of a natural resource. For example, a socialist state might elect to provide petroleum produced from deposits within its areas of jurisdiction to its consumers at cost of production only: accordingly, there would be no "profits" to be shared.
- There are substantial differences among accounting and tax systems in use throughout the world. These differences involve the treatment, and definition, of deductible expenses, amortization and depreciation of capital assets, and the rate and manner in which revenue, less deductible expenses, is taxed. Accordingly, profit sharing would be inequitable to one coastal state vis-a-vis another coastal state whose system of taxation is less favorable to the private investor. Because of these wide differences in accounting and taxing procedures, the only way that a profit sharing formula could be applied equitably to all qualifying coastal states would be through the creation of both an international accounting system (which, by its very nature, would have to embody certain arbitrary assumptions) and a uniform policy of taxation for all prospective petroleum areas on that portion of the continental margin seaward of the 200 nautical mile Exclusive Economic Zone.
- The revenue sharing formula provides that a risk taker (i.e., a private operator) will recover a significant portion of the very high investment monies that have been sunk in a resource extraction venture before the obligation to share revenues is imposed.

In conclusion, I believe that the international petroleum industry can live with a law of the sea treaty incorporating those provisions of the Draft Convention that specifically apply to margin delimitation and revenue sharing seaward of the 200 mile Exclusive Economic Zone as well as navigation and pollution control. The provisions of this treaty for the petroleum industry are not nearly so restrictive, complicated or controversial as those that apply to resource extraction on the deep seabed.

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THE OFFSHORE JURISDICTION OF THE STATES OF THE
UNITED STATES AND THE PROVINCES
OF CANADA -- A COMPARISON

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INTRODUCTION

A classic area of conflict related to the exploitation of resources offshore of the United States and Canada concerns the scope of the territorial and other jurisdiction of the states of the United States and the provinces of Canada. As far as I am aware, there has been no recent effort to pull together the developments in this area. I have taken this opportunity to review the status of the offshore boundaries of the states of the United States and the provinces of Canada. While the discussion that follows provides an overview and analysis of the legal situation, the main focus of this effort lies in the two annexes that detail the claims of offshore jurisdiction by the states and provinces and the status of those claims. In a sense these annexes supplement the two authoritative works that primarily document the land boundaries of these political entities [1].

Knowledge about the scope of the offshore jurisdiction of the states of the United States and the provinces of Canada has practical value for those involved in the regulation and exploitation of offshore resources in those areas. In addition, the subject raises important issues concerning the efficient and beneficial division of resources within a federal union. This paper does provide the reader with information on how the laws of the United States and Canada have divided these responsibilities. Since there are significant differences in the way that Canada and the United States have handled this matter, a comparison of the two systems is interesting and provides the basis for a critical analysis. The final section of this paper seeks to draw some conclusions from the information presented in the earlier sections and the annexes to evaluate the legal regimes used in each country. It becomes apparent that each country's system has advantages as well as disadvantages.

Although the offshore jurisdiction of the states and the provinces has been considered for decades, it is the focus of intense interest in both countries at this time. In the United States there is movement by the coastal states to seek an expansion of their offshore jurisdiction as granted in the Submerged Lands Act of 1953, 43 U.S.C. SS 1301-1314 [2]. In Canada, the maritime provinces have increased their pressure for recognition of offshore jurisdiction. The question of Newfoundland's offshore jurisdiction is now before the Court of Appeal of the Supreme Court of Newfoundland and the Supreme

Court of Canada on separate references. Another reference involving waters offshore of British Columbia is currently on appeal to the Supreme Court of Canada.

THE LEGAL REGIMES

The Offshore Jurisdiction of the States of the United States

Litigation over the seaward jurisdiction of the coastal states of the United States goes back to the mid-1940's, when the federal government initiated suits in the United States Supreme Court against California, Texas and Louisiana. Those early decisions held that the states had no territorial jurisdiction seaward of the coastline [3]. More recently, in the 1970's, the same issue was litigated with respect to the states on the east coast of the United States with the same result [4]. Thus, it clearly can be stated that no state of the United States held jurisdiction beyond the coastline absent a specific legislative grant of offshore jurisdiction from the federal government. Absent a legislative grant, the coastline is to be determined on the basis of the state's boundary description and federal law.

Immediately after the Supreme Court's decision in the California, Texas, and Louisiana cases the coastal states began an effort to obtain a Congressional grant of offshore jurisdiction, and in 1953, with the enactment of the Submerged Lands Act, the coastal states obtained a limited grant of offshore jurisdiction. That legislation gave the coastal states resource jurisdiction over the waters and submerged lands located within three nautical miles of their coastlines. In an exceptional provision, the Act gave the states on the Gulf of Mexico the right to an offshore area extending to a maximum of nine nautical miles if they could establish an historic boundary seaward of the three mile limit. Only Texas and Florida (in the Gulf of Mexico) were able to establish the necessary historic claims to obtain jurisdiction beyond three nautical miles [5]. Consequently, the offshore jurisdiction of the states is limited to three nautical miles from the coastline except in the cases of Texas and Florida in the Gulf of Mexico, which are limited to nine nautical miles. A more difficult set of issues, however, concerns the actual delimitation of those boundary lines. The resolution of that issue has revolved around two types of boundary questions. First, what is the location of the coastline as used in the Submerged Lands Act? Second, what is the location of the seaward boundaries between the coastal states?

The United States Supreme Court has answered both questions in principle by reference to the public international law of ocean boundary delimitation. In a series of cases it has applied the rules found in the Convention on the Territorial Sea and Contiguous Zone [6], to questions concerning the location of the coastlines of the states for Submerged Lands Act purposes [7]. In a related development the federal government has placed

on the large scale nautical charts (1:80,000 scale) of its coast issued by the National Ocean Survey (NOS) lines showing the three and twelve mile limits of the United States and closing lines where they affect the three mile limit. These lines reflect the position of the federal government on the application of the international law to the coast. Thus, they identify the coastline for international purpose as well as for Submerged Lands Act purposes as viewed by the Executive Branch [8]. In the absence of challenge by the states these lines are presumably not disputed.

The law is less developed in the case of boundaries in the seas between the states due to the existence of a number of interstate compacts and only one Supreme Court decision on that issue that addresses the merits [9]. In that one case the Court used international legal principles to locate the ocean boundary between Texas and Louisiana. In an administrative decision, the federal government applied public international law rules to delimit extended lateral boundaries of certain coastal states for the limited administrative purposes of the Coastal Zone Management Act's Coastal Energy Impact Program (CEIP). [10]. The federal legislation appeared to demand the use of that law [11]. Consequently, in the absence of an agreement to the contrary, it would appear that the legal rules that will be used to delimit the offshore boundaries between the states of the United States and those between the states and the United States will be those found in public international law as interpreted and applied by the United States courts.

The task of delimiting the offshore boundaries of the coastal states of the United States is actively pursued through litigation, negotiation, and legislation. Despite the fluid situation in some areas, many issues are well settled. The material found in Annex I briefly summarizes the situation by discussing each of the coastal states, beginning with New Hampshire and proceeding clockwise around the continental United States before reaching Hawaii and Alaska.

The Offshore Jurisdiction of the Provinces of Canada

The question of provincial jurisdiction in the adjacent seas of Canada appears to be an open political question and perhaps even an open legal question for all the provinces except, perhaps, British Columbia. This is particularly true in the case of many large enclosed and semi-enclosed bodies of water on the Canadian coast. The provinces have long sought recognition of their offshore jurisdiction. The federal government has opposed this claim arguing that the provincial jurisdiction ends at the shore. This dispute came to a head in Reference re Offshore Mineral Rights (British Columbia) [12] While the case technically involved only the British Columbia claim, virtually all of the coastal provinces appeared to argue for a decision that would recognize the offshore jurisdiction of the provinces. In its decision the Supreme Court of Canada ruled against British Columbia finding no provincial offshore

Jurisdiction in the territorial sea and continental shelf of Canada. As a reference, this case did not result in a binding judicial decree, but the decision does have important precedential value.

The issue is very much alive, at least, for the Atlantic Provinces. Recently, Newfoundland submitted a reference on the question to the Court of Appeal of the Supreme Court of Newfoundland [13]. On May 19, 1982, the federal government submitted to the Supreme Court of Canada a reference on the question of Newfoundland's jurisdiction over resources in the Hibernia area in the Atlantic [14]. A decision of last year by the Canadian Labour Relations Board in Canadian Merchant Services Guild, et al., v. Crosbie Offshore Services, Ltd., [15] presented this jurisdictional question, but the Board deftly avoided the issue. The Federal Court of Appeal also avoided the issue when the case was considered on appeal [16]. Negotiations between the Atlantic provinces and the federal government on the question have been undertaken sporadically at least since 1964.

In 1964 a conference was held between the Premiers of the four Atlantic Provinces (Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland) and the Prime Minister of Canada. The Submission of the Atlantic Premiers sought federal recognition of their claims to provincial offshore jurisdiction. Attached to the Submission was an agreement reached by the four Premiers and Quebec which delimited the alleged maritime boundaries of these five provinces in the Bay of Fundy, the Gulf of Saint Lawrence and their adjacent waters. While the Submission called for federal legislation implementing this agreement, none was forthcoming.

A subsequent effort to resolve the federal-provincial dispute was made in 1977. Prime Minister Trudeau proposed a division of revenues and administrative responsibilities based upon lines drawn in the offshore waters in lieu of territorial jurisdiction of the provinces in offshore areas. The resulting Memorandum of Understanding signed by the Canadian Prime Minister and the Premier of Nova Scotia, Prince Edward Island and New Brunswick expressly used the 1964 interprovincial maritime boundary lines for these purposes [17]. It was expected that this understanding would ultimately form the basis for legislative action [18]. This did not take place and I understand that some of the current Premiers believe that the 1977 Understanding did not give their provinces what they deserve. On March 2, 1982, the federal government and Nova Scotia entered into an agreement for the management and sharing of revenues from seabed development off the northern and eastern coasts of Nova Scotia. Although the area covered by the agreement is described by use of the boundary lines developed in the 1964 Submission, the agreement specifically leaves open the territorial jurisdiction question. Legislation will be required to implement the agreement.

The question of the line dividing federal and provincial jurisdiction is unclear even in areas where the big question of expansive provincial jurisdiction is not relevant. In a case

subsequent to the 1967 Reference to the Supreme Court of Canada, British Columbia obtained a favorable ruling from the British Columbia Court of Appeal on the delimitation question [19]. In a narrow three to two decision, the Court found that British Columbia had property rights in the lands covered by the waters of the Strait of Juan de Fuca, the Strait of Georgia, Johnstone Strait and Queen Charlotte Strait. The majority found that all of these straits were not covered by the 1967 Reference, because they are internal waters. The federal government has appealed that decision to the Supreme Court of Canada.

This most interesting decision exposes some of the weaknesses in the 1967 Reference and the need for further development of Canadian law delimiting the seaward limits of the provinces. The 1967 Reference is particularly ambiguous as to the landward limits of the waters under consideration. Question one of the 1967 Reference clearly identifies the seaward limit of the waters in dispute of that part of the Reference as the limit of the modern territorial sea of Canada, but it is unclear whether the reference to the interior limit is to the modern coastline or to the historic territorial limits to be derived from the boundary law of British Columbia or from the common law [20]. The opinion did little to clarify this point, although it often used the term "territorial sea," which could be read as implying that it was using the modern baseline throughout. On the other hand, one major line of reasoning in the case was that the territorial jurisdiction of the province would not automatically expand as a result of the acquisition of territory by the federal government through developments in international law. (The continental shelf outside of the territorial sea was treated as a separate question.) In the Strait of Georgia Reference the British Columbia Court of Appeal was not much clearer on the point, although two dissents raised the issue. The majority opinion interpreted the 1967 Reference as only holding that the waters of the territorial sea of Canada were not within the Province's jurisdiction. Since the counsel for the Attorney General of Canada "conceded that the waters involved in this reference are 'internal waters'" [21], the Court had little difficulty supporting the contention of British Columbia. There is no discussion of the question of the theory that supported the concession that the waters are internal waters. The dissents asked that question and concluded that on the basis of the 1967 Reference the determination would have to be on the basis of the common law rules of boundary delimitation. Using those rules they argued that none of the waters qualified as internal waters and that they were covered by the 1967 Reference. Thus, they should be considered to be within the jurisdiction of the federal government. The dissents' analyses imply that the majority's finding on this matter was based on the modern rules for delimiting the coastline. Since the waters do not constitute a juridical bay and no system of straight baselines close the area, the only theory available to support the conclusion that the waters are inside the modern coastline is that they constitute historic

internal waters. Otherwise, they would be part of the territorial sea found within the straits. The opinions give no information on how the federal government's counsel concluded that the waters were internal.

The ambiguities in these two opinions make it very difficult to express an opinion on the Canadian law on the question of the offshore jurisdiction of the provinces. On the basis of the 1967 Reference it would appear to be settled that, absent legislative changes, the provinces do not have jurisdiction over the territorial sea or continental shelves of Canada. It is, however, more difficult to identify the exact dividing line between federal and provincial jurisdiction. Is it the modern coastline as defined in international law, as adopted and interpreted by Canada, even if advancements in that law have moved the internal waters seaward? Is it the historic coastline as found in official descriptions of the provinces, as interpreted by the contemporaneous common law? Is it some other mixture of these rules that may have been used in the Strait of Georgia Reference? This uncertainty has permitted the federal-provincial disputes to fester and has encouraged the current litigation and others that are likely to arise in the future [22].

If the modern coastline is the relevant factor, reference can be made to the Canadian straight baselines. Canadian legislation specifically authorizes the Governor in Council by order to issue lists of geographical coordinates of points on the Canadian baseline to be joined by straight lines [23]. The Minister of Energy, Mines and Resources has been authorized to issue charts delineating the territorial sea of Canada and its fishing zones [24]. Such descriptions and charts have been issued for some areas.

The discussion in Annex II briefly reviews the claims made by the provinces (to the extent that I have been able to obtain that information) and the status of the provincial maritime boundaries. It proceeds in a clockwise direction, starting with British Columbia.

CONCLUSION

The review of the seaward claims of the Canadian provinces and those of the states of the United States demonstrates that there is much to be resolved before one will be able to describe definitely the offshore ocean boundaries of these political units. While there are similarities, there are also substantial differences in the law being used by these countries to resolve these disputes. Both nations' laws have first looked to historic boundary descriptions to locate the relevant boundaries. The United States, however, has used general international law to locate these boundaries, when the historic boundary is ambiguous, and to fill gaps in modern legislation. Thus, absent an explicit agreement, the boundaries in the seas of the United States are closely linked to rules of general international law now in use. The state of the Canadian law on

this question is less clear. The two modern references on this question are ambiguous on the question of whether the provincial-state boundary is dependent upon the delimitation of the coastline under modern rules of general international law or on rules of interpretation derived from the common law. The pending Canadian cases on these questions may help to answer this question.

There are advantages and disadvantages to the use of modern international law rather than the historic rules. The advantage of the historic rule is that this body of law is fixed and, thus, the boundary can be located for all time. The disadvantage is that the historic common law rule may not be well defined or may be anachronistic. It was developed with a focus on private land boundaries and conditions existing in England in historic times.

Modern international law is certainly not anachronistic and, due to the attention that it has recently received, is relatively well developed. It does focus on the territorial boundaries of governmental units. On the other hand, the evolving nature of the modern ocean boundary rules could create great uncertainty about the true location of the relevant boundaries. Thus, within the United States it appears that the seaward jurisdiction of the states may change as international law changes. While California's jurisdiction over bays was limited to historic bays and to 10 mile bays up to the early 1950's, the fact that the United States ratified the Convention on the Territorial Sea and the Contiguous Zone in 1961 caused the jurisdiction of the state to expand to include all 24 mile bays [25]. The United States has not yet adopted a system of straight baselines on any of its coasts. When it does, as it most certainly will, would the territory of the states expand seaward? If the lines were changed, would the state's jurisdiction expand or contract as a result? Since the Submerged Lands Act of 1953 granted the states jurisdiction to the three mile limit that coincided with the territorial sea limit claimed by the United States, would a new United States claim of a 12 mile territorial sea create a political situation that would demand a parallel change in the Submerged Lands Act grant?

The linkage of domestic boundary issues to modern international law may create difficulties with respect to the international posture of the nation. Thus, the activities of the federal government in international affairs will have an impact on its domestic disputes and vice versa. Similarly, domestic courts sitting on these cases may be constrained by the desire not to embarrass the federal government internationally by deciding matters contrary to the government's international positions. At the same time the courts do not want to sacrifice their independence by being unduly deferential to the federal government [26]. The United States Supreme Court was sensitive to this issue when it grafted the Convention on the Territorial Sea and Contiguous Zone on to the Submerged Lands Act. It thought it avoided the problem by freezing the law for that case

based on the current convention text [27]. Many subtle questions of interpretation were left open, however, not to speak of questions relating to straight baselines and historic bays.

More broadly, the provinces and the states have argued on the political level that the resources in the waters and seabed adjacent to their coasts should be considered their resources. This argument is based upon the same arguments that have supported the development of the international regimes for coastal state jurisdiction over broad ocean zones such as the fisheries zone, the exclusive economic zone, and the continental shelf -- that the natural resources of the seas and seabed appertain to the adjacent land mass. The states of the United States have also argued that offshore development creates economic hardships that require compensation from the federal government, if they are denied jurisdiction over the exploitation activities. Consequently, the Coastal Energy Impact Program was established and funded to provide some payments to the states adjacent to outer continental shelf development. Others argue to the contrary that within a federal union the adjacent resources ought to be considered resources of the nation as a whole and should not simply benefit the coffers of the nearest state or province -- that it should be a shared resource. Similarly, it is questioned whether offshore development results in a net cost to the adjacent territory or a net benefit due to the fact that support activities and personnel generate large amounts of local business.

The coastal states of the United States have been successful in obtaining some rights in offshore areas because they have specific and identified interests and objectives. The opposition is diffuse, coming from the federal establishment and the interior states that do not perceive as direct an interest in the matter. Their particular share of offshore revenues and products cannot be clearly identified. The single attempt in the United States to challenge the constitutionality of the Submerged Lands Act grant in court failed [28].

In conclusion, both Canada and the United States will continue to face, at the political and legal levels, difficult issues concerning the boundaries of their constituent provinces and states, respectively. It must be hoped that, as the choices are made, the decision makers will have a full appreciation of the advantages and disadvantages of the alternatives.

NOTES

1. F.K. Van Zandt, Boundaries of the United States and the Several States, (U.S. Geological Survey, Professional Paper 909, 1976); and N. Nicholson, The Boundaries of the Canadian Confederation (MacMillan of Canada, 1979).
2. See, Burke, "U.S. Fishery Management and the New Law of the Sea", 76 Amer. J. Int'l Law 25, 50 (1982).
3. United States v. California, 332 U.S. 19 (1947); United States v. Louisiana, 339 U.S. 699 (1950); United States v. Texas, 339 U.S. 707 (1950).
4. United States v. Maine, et al, 420 U.S. 515 (1975).
5. United States v. Louisiana, et al, 363 U.S. 1 (1960); United States v. Louisiana, et al (Florida), 363 U.S. 121 (1960).
6. 15 U.S.T. 1606, TIAS No. 5639, 56 UNTS 205 (In force Sept. 10, 1964)
7. United States v. California, 381 U.S. 139 (1965), 346 U.S. 32 (1978), 100 S. Ct. 1994 (1980); United States v. Louisiana, et al, 394 U.S. 11 (1969), 420 U.S. 529 (1975), 100 S. Ct. 1618 (1980).
8. United States Attorney's Memorandum Number 752 by Deputy Attorney General Richard Kleindinst, dated May 18, 1971.
9. Texas v. Louisiana, 426 U.S. 465 (1976).
10. 16 U.S.C. Par. 1451 (1979).
11. See, Charney, "The Delimitation of Lateral Seaward Boundaries Between States In a Domestic Context", 75 Amer. J. Int'l Law 28 (1981). A similar lateral boundary extension called for in the Outer Continental Shelf Lands Act (OCSLA), 43 U.S.C. Par. 1333(a)(2), for the purpose of applying state substantive laws as federal law has never been executed. See, Rodrigue v. Aetna Casualty Co., 395 U.S. 352 (1969).
12. 62 W.W.R. 21 (1967).
13. Order in Council No. 135-'82, approved February 12, 1982.
14. P.C. 1982-1509.
15. Decision 291 (December 30, 1981).
16. Seafarer's International Union of Canada v. Crosbie Offshore Services Ltd., et al., Federal Court of Appeal of Canada, Case Number A-2-81, Judgment Rendered at Ottawa, March 5, 1982.
17. Federal-Provincial Memorandum of Understanding In Respect of the Administration and Management of Mineral Resources Offshore of the Maritime Provinces February 1, 1977).
18. See R. Harrison, "The Offshore Mineral Resources Agreement In the Maritime Provinces", 4 Dalhousie Law J. 246 (1978).
19. Reference re Ownership of the Bed of the Strait of Georgia and Related Areas, 1 B.C.L.R. 97 (1976) [hereinafter the Strait of Georgia Reference].
20. The language used was as follows: "from the ordinary low-water mark on the coast of the mainland and the several islands of British Columbia, outside the harbours, bays,

- estuaries and other similar inland waters ..." 1967
 Reference at pp. 22-23.
21. Strait of Georgia Reference at 106.
 22. For a discussion of the issues inherent in Canadian federalism see, H.S. Fairley, Canadian Federalism, Fisheries and the Constitution: External Constraints on Internal Ordering, 12 Ottawa L.R. 257 (1980).
 23. The Territorial Sea and Fishing Zones Act, Revised Statutes of Canada, Chapter T-7.
 24. Id.
 25. United States v. California, 381 U.S. 139 (1965). See also, United States v. Alaska, 353 F.2d 210 (C.A. 9 1965), in which the Ninth Circuit Court of Appeals reversed the Alaska District Court decision which applied the earlier 10 mile bay closing line rule. United States v. Alaska, 236 F. Supp. 388 (D. Alaska 1964).
 26. See e.g., Charney, "Judicial Deference in Submerged Lands Cases", 7 Vand. J. of Trans. L. 383 (1974).
 27. United States v. California, 381 U.S. 139, 166-167 (1965).
 28. Alabama v. Texas, 347 U.S. 272 (1954).

ANNEX I

The Status of the Boundaries In the Seas of the States of the United States

MAINE

As is true for all of the coastal states along the east coast of the United States, Maine was a party to United States v. Maine, et al., 420 U.S. 515 (1975), which applied the reasoning of the early California, Louisiana and Texas cases to the east coast. United States v. California 332 U.S. 19 (1947), United States v. Louisiana, 339 U.S. 699 (1950); United States v. Texas 339 U.S. 707 (1950). The east coast states' offshore area is thus limited to the Submerged Lands Act grant of three nautical miles from the coastline. United States v. Maine, et al., 423 U.S. 1 (1975) (decree). Questions concerning the exact location of the coastline of the states that are parties to this case has been referred to a United States Supreme Court special master. United States v. Maine, et al., 433 U.S. 917 (1977). Although the Maine coast would qualify for the application of a system of straight baselines, the United States has not established such a system in that area nor for any other part of its coastline. See, United States v. California, 381 U.S. 139, 167-168 (1965). Thus, the normal coastline rules found in the Convention on the Territorial Sea and the Contiguous Zone has been applied in preparing the ocean boundaries lines shown on the United States nautical charts. Maine has not actively challenged the federal government's disposition of that issue.

Maine did go to litigation over its lateral boundary with New Hampshire. New Hampshire v. Maine, 426 U.S. 465 (1976) (opinion), 434 U.S. 1 (1977) (decree). That case involved the application of a 1740 Decree of King George II of England which set the applicable boundary between the mainland coastline and the Isles of Shoals, a group of islands which lie offshore about five to six nautical miles from the mainland. Notwithstanding the Special Master's Report to the contrary, the Court allowed the entry of a consent decree submitted to the Court by the parties. That consent decree uses a straight line drawn between the midpoints of the entrances to the mainland and island harbors. No boundary has been delimited between those states seaward of the line found in the consent decree. In fact, the states sought to resolve their differences over seaward boundaries for the purpose of the CEIP but failed to reach that objective. The effort was abandoned in favor of an agreement among the states of New Hampshire, Maine, Massachusetts, and Rhode Island to divide funds available under that act equally without regard to boundary lines. This agreement is recorded in individual letters of various dates (Maine - April 7, 1981; Massachusetts - March 27, 1981; New Hampshire - March 30, 1981; Rhode Island - April 9, 1981) from the governors of these states to Robert Knecht, Acting Assistant Administrator of the Office of Coastal Zone Management.

The northern seaward boundary of Maine is tied to the international boundary between the United States and Canada. The territorial sea boundary has been settled by international agreement. Treaty Concerning the Boundary Line in Passamaquoddy Bay, done May 21, 1910, United States-Great Britain, 36 Stat. 2477, TS No. 551, 12 Bevans 341. The final delimitation was accomplished in the 1925 Convention to regulate the level of the Lake of the Woods, done February 24, 1925, United States-Great Britain, 44 Stat. 2180, TS No. 721, 6 Bevans 7. The boundary seaward is in active litigation before a panel of the International Court of Justice. (See, Feldman & Colson, "The Maritime Boundaries of the United States," 75 Amer. J. Int'l Law 729, 754-763 (1981)).

NEW HAMPSHIRE

The New Hampshire situation is virtually identical to that of Maine. Its offshore boundary has not been the subject of active interest other than in the context of the broad question litigated in the case of United States v. Maine, et al, 420 U.S. 515 (1975). As discussed in the prior section, it was a party to the New Hampshire v. Maine litigation over a portion of its seaward boundary with Maine. It is also a party to the CEIP agreement of the New England coast states discussed above. Notwithstanding the CEIP agreement, New Hampshire's ocean boundary with Massachusetts was the subject of work by boundary commissioners from both states and the state legislatures at the turn of the century. A description of the boundary is found in the statutes of both states. New Hampshire Chapter 115, Laws of 1901; Massachusetts Chapter 369, Acts of 1899. This boundary runs from the land boundary seaward on a course of 86 degrees 07'30"E. There was no consent to this agreement given by the United States Congress. As a consequence, the status of that boundary may be in question.

A recent New Hampshire statute describes the boundary seaward of the agreed line as follows:

As defined in Chapter 115, 1901; and thence one hundred and seven degrees east (true) to the outward limits of state jurisdiction, as defined in RSA 1:14.

New Hampshire Revised Statutes Annotated § 1.15 (1979 Supp.) Massachusetts has not agreed to that line. The CEIP agreement of the New England coastal states has probably put this matter to rest for a while.

MASSACHUSETTS

Subsequent to the principal opinion in United States v. Maine, et al, 420 U.S. 515 (1975), Massachusetts focused on the question of the location of its coastline for Submerged Lands Act purposes. The United States and Massachusetts were in agreement that since Cape Cod Bay qualified as a juridical bay,

the coastline would run between the headlands of that bay. A more difficult question arose in the context of Buzzards Bay, Vineyard Sound, and Nantucket Sound, where Massachusetts has sought to draw a closing line seaward of those asserted by the United States. The Buzzards Bay issue has been settled. The remaining claims in the sounds are in active litigation before a Special Master appointed by the Supreme Court within the umbrella of United States v. Maine, et al, 433 U.S. 917 (1977).

Massachusetts' lateral boundary with Rhode Island is included within the New England states' CEIP agreement and, thus, is not clearly resolved. Massachusetts does have legislation that describes a boundary seaward from the coastline:

... from a coastal baseline beginning at the westernmost point of land, at mean low tide, in the town of Gay Head and running westerly to the easternmost point of the contour representing sixty feet of ocean depth above the formation identified as Brown's Ledge on Chart No. 1210 or its subsequent replacement published by the United States Coast and Geodetic Survey or by its successor, extending from said baseline to the outer lines of the territorial sea of the United States.

1 Mass. Gen. L. Ann. Paragraph 3 (West 1976). It is not clear whether or not Rhode Island has agreed to that line.

RHODE ISLAND

Rhode Island is a party to United States v. Maine, et al, 420 U.S. 515 (1975), and is now engaged in active litigation with the United States before the Supreme Court's Special Master over the location of its coastline in Block Island Sound. United States v. Maine, et al, 433 U.S. 917 (1977). New York has joined Rhode Island in this matter. They claim that the entire Sound is internal waters of the United States such that the coastline is to be delimited by lines extending from the mainland shore to Block Island and then on to Long Island. The United States disputes this claim asserting that the normal coastline in the area would follow the coastline on the northern side of the Sound until a closing line from the mainland to Long Island at Montauk Point is reached.

While the Rhode Island boundary with Massachusetts is unresolved, its boundary with New York is settled, apparently, for all purposes. Rhode Island and New York are parties to an interstate compact that has received Congressional approval. It delimits their boundary from the mainland to a line between Block Island and Montauk Point. Act of July 3, 1944, Ch. 399, 58 Stat. 723 (1944); 1942 Rhode Island Public Laws, Ch. 1145, and 1943 New York Laws, Ch. 355. That line was examined for the purposes of the CEIP and extended along an equidistant line seaward to the 1,000 fathom contour for the administrative

purposes of the CEIP. (See Charney, *supra* note 11, at 40.) The states have not challenged this delimitation.

NEW YORK

New York was a party to United States v. Maine, et al., 420 U.S. 515 (1975), and is a party to the Block Island Sound proceedings. Otherwise, the seaward boundaries found on the N.O.S. charts are apparently not disputed. As was the case for its boundary with Rhode Island, New York has agreed with New Jersey to fix their mutual seaward boundary. An Interstate agreement delimits that boundary through Raritan Bay and beyond. N.Y. State Laws, State Boundaries, Art. 2, Paragraph 7, at 36 (McKinney, 1952); New Jersey Statutes Annotated S 52:28-1 et seq. These states have not sought the consent of Congress to this agreement. In the CEIP lateral boundary proceedings these states accepted the binding effect of the agreement. The CEIP decision has extended that line for CEIP purposes to the 1,000 fathom contour along an equidistant line. (See Charney, *supra* note 11, at 41 and 50.) While this boundary delimitation may have implications for the territorial boundary within the three mile band it has not determined that boundary.

NEW JERSEY

New Jersey was a party to United States v. Maine, et al., 420 U.S. 515 (1975). New Jersey's coastline is fairly regular, presenting little basis for dispute over its location. Unlike its northern water boundary with New York, its southern boundary has not been settled by an interstate agreement. In the case of New Jersey v. Delaware, 291 U.S. 361 (1934) (decision), 295 U.S. 694 (1935) (decree), the question of the boundary in Delaware River and Bay was litigated. The decision established the thalweg as the basis for the boundary delimitation. In the CEIP boundary proceedings New Jersey argued that the decision applied to the waters seaward of the mouth of the Bay and thus fixed its lateral seaward boundary with Delaware. The administrative decision in that matter found that the Court's delimitation and its reasoning stopped at the entrance to the Bay. The CEIP line was delimited on the basis of a modified equidistant line that runs slightly north of a true equidistant line, in a southeasterly direction. (See Charney, *supra* note 11, at 59 and 60.)

DELAWARE

Delaware was a party to United States v. Maine, et al., 410 U.S. 515 (1975). It has a short regular coastline that has not given rise to disputes over its location. Its seaward boundary with New Jersey has been discussed in the prior section. Delaware's seaward boundary with Maryland has not been addressed except in the context of CEIP boundaries. Based upon a finding that there is a relationship between the two boundaries, the

federal government established a modified equidistant line at the Delaware-Maryland boundary for CEIP purposes. That CEIP boundary runs slightly south of the true equidistant line in a southeasterly direction. (See Charney, SUPRA note 11, at 59-60.)

MARYLAND

Maryland was a part to United States v. Maine, et al, 420 U.S. 515 (1975). Its boundary is also short and presents few interesting delimitation questions. While its CEIP boundary with Delaware had to go to adversary proceedings, its boundary with Virginia has been settled for all purposes by interstate compact. That interstate compact, Public Law Number 92-565, 86 Stat. 1179 (1972), fixes that maritime boundary on a line that runs in the direction of "due east (true) to the Maryland-Virginia Jurisdictional Limit ..." from the land boundary at the coastline.

VIRGINIA

Virginia was a party to United States v. Maine, et al, 420 U.S. 515 (1975). Chesapeake Bay on the coast of Virginia has been determined to be an historic bay. Since the adoption of the 24 mile bay closing line rule the historic status of the Bay has little modern significance. No other unusual features or circumstances on the Virginia coast have given rise to disputes over the location of the Virginia coastline for the delimitation of its three mile band of submerged lands.

Virginia is a party to interstate compacts establishing its seaward boundaries with Maryland and North Carolina to run due east from their respective land boundaries. P.L. No. 92-565, 86 Stat. 1179 (1972) (Maryland); P.L. 92-588, 86 Stat. 1298 (1972) (North Carolina).

NORTH CAROLINA

North Carolina was a party to United States v. Maine, et al, 420 U.S. 515 (1975). With the exception of Pamlico Sound, North Carolina does not present any difficult coastline delimitation questions. Since the United States and the State are in agreement that the Sound contains internal waters out to closing lines drawn between the barrier islands, no dispute has arisen over questions of delimitation. North Carolina has interstate compacts settling its maritime boundaries with its neighbors to the north and south. While the North Carolina-Virginia line runs due east, the North Carolina-South Carolina line is a straight line extension of the land boundary which runs in a southeasterly direction. Public Law 97-59, 95 Stat. 988 (1981).

SOUTH CAROLINA

South Carolina was a part to United States v. Maine, et al, 420 U.S. 515 (1975). With no dispute having arisen over the location of the South Carolina coastline and the recent entry into force of its lateral boundary agreement with North Carolina (P.L. 97-59, 95 Stat. 988 (1981)), the only outstanding question that appears to face South Carolina is its seaward boundary with Georgia. The South Carolina-Georgia boundary has been heavily litigated with the first case arising in the 1920's. Georgia v. South Carolina, 257 U.S. 516 (1922) (decision), 259 U.S. 572 (1922) (order). That case involved only the boundary in the Savannah River. The current litigation involves both the river boundary and the offshore boundary. Georgia v. South Carolina, 434 U.S. 917 (1977). The case is now before a special master appointed by the Supreme Court who is about to address the ocean boundary question. The pleadings show that Georgia will claim a due east line while South Carolina claims an equidistant line which would run in a southeast direction from the mouth of the Savannah River.

GEORGIA

Georgia was a party to United States v. Maine, et al, 420 U.S. 515 (1975). While the Georgia shoreline is more irregular than those of its neighbors to the north and south, the mean low water line and the ends of jetties along the coast dominate the coastline for the purposes of delimiting the three mile limit. Thus, there is little basis for disputes to arise on this question. Unlike its maritime boundary with South Carolina, Georgia has reached an agreement with Florida over their mutual maritime boundary. The applicable interstate compact delimits the boundary seaward from the boundary at the jetties at the mouth of the St. Mary's River "due east to the seaward limit of Georgia and Florida as now or hereafter fixed by the Congress of the United States; such boundary to be extended on the same true 90-degree bearing so far as a need for further delimitation may arise ..." Public Law 91-498, 84 Stat. 1092 (1970).

FLORIDA

Florida was a party to United States v. Maine, et al, 420 U.S. 515 (1975) as well as United States v. Louisiana, et al, U.S.S. Ct. No. 9 Original. The Submerged Lands Act grant to Florida has been found to extend nine nautical miles seaward in the Gulf of Mexico. United States v. Louisiana, et al, (Florida), 363 U.S. 121 (1960), 364 U.S. 502 (1960). On its other coast the grant has been limited to three nautical miles. United States v. Maine, et al, 423 U.S. 1 (1975). The Supreme Court held that for those purposes the Gulf of Mexico stops at the western end of the Straits of Florida. United States v. Florida, 420 U.S. 533 (1975).

For the most part, the Florida shoreline is even, presenting no basis for diversion from the mean low water line, and simple bay or river closing lines. More difficulty is presented on the western side of the southern tip of the state at Florida Bay. This bay is formed by the string of islands called the Florida Keys. Florida took the position that the area was historic internal waters deserving a long closing line from the last of the islands to the mainland to the north. The United States maintained that the normal rules for coastline delimitation apply, and due to the location of islands within the bay the coastline affecting the three and nine mile limits is the mean low water line of the islands. The Supreme Court agreed with the United States and used the coastline within the bay. United States v. Florida, 420 U.S. 531 (1974).

Florida's seaward boundaries with its adjacent states of Georgia and Alabama have both been settled by Interstate compact. Both use a straight line direction of points on the compass. While the Georgia line runs due east, the Alabama line runs due south from the land boundary "to the seaward limit of each respective state ..." Public Law No. 83-351, 68 Stat. 77 (1954).

ALABAMA

The Alabama shoreline presents no delimitation problem until the extreme western portion of the state is reached west of Mobile Bay. In that area the barrier islands move away from the mainland to form Mississippi Sound which runs westward across the Mississippi shoreline. Both Alabama and Mississippi maintain that Mississippi Sound is internal waters of the United States such that there are no areas within the Sound that fall outside of the submerged lands of the states. The United States maintains, to the contrary, that the Sound is neither a juridical bay nor historic international waters. Consequently, the Submerged Lands Act grant is to be measured from the mean low water line landward and seaward of the islands. Such a delimitation creates enclaves within the Sound beyond state jurisdiction. This issue is in active litigation in the United States Supreme Court and has been referred to a special master within the case of United States v. Louisiana, et al, U.S.S. Ct. No. 9 Original.

While Alabama has settled its lateral boundary with Florida by Interstate compact, its boundary with Mississippi is not settled. In January of 1978 Mississippi and Alabama did enter into an agreement for CEIP purposes only to extend their boundary seaward in a due south direction. Since the CEIP only applies to the area seaward of the three mile Submerged Lands Act grant, this agreement has no application to the three mile band within these states' territorial jurisdiction. No other agreement or judicial decision establishes their maritime boundary in that area for any purpose.

MISSISSIPPI

As was discussed in the review of the Alabama coastline, the question of the seaward delimitation of the Mississippi territorial jurisdiction in Mississippi Sound is a matter of active litigation. Similarly, Mississippi's lateral boundary with Alabama remains an open question outside of the CEIP.

The Mississippi-Louisiana water boundary, however, has been delimited, at least in part. In the 1906 United States Supreme Court case of Louisiana v. Mississippi, 202 U.S. 1 (1906) (opinion), 202 U.S. 58 (1906) (decree), the Court applied the thalweg principle to delimit that boundary from the Pearl River through Lake Borgne and Mississippi Sound "to the Gulf of Mexico." 202 U.S. at 58 (1906). In the CEIP proceedings a dispute developed over the seaward limit of the Court's determination in the 1906 case. Louisiana argued that the decree governed the boundary delimitation seaward of Ship Island Pass into the open waters beyond. Mississippi sought to limit the decree to the waters landward of the barrier islands. In establishing the CEIP boundary line, the federal government interpreted the 1906 decision as having no application seaward of the closing line at Ship Island Pass. The CEIP boundary line was thus delimited on the basis of a modified equidistant line that generally ran slightly east of south. See Charney, supra note 11, at 44). Since the CEIP delimitation has only limited purposes and only applies beyond the three mile Submerged Lands Act grant, the territorial boundary between the states beyond the line specifically delimited in the 1906 case was not actually decided. That CEIP delimitation was challenged in federal court by the states. State of Louisiana v. Luther Hodges, Jr., et al., Civil Action No. 79-601-B (M.D. La); State of Mississippi v. Secretary U.S. Department of Commerce, et al., Civil Action No. J79-0634(R) (S.D. Miss.). Both cases were dismissed on March 9, 1982, by United States Circuit Judge Charles Clark pursuant to a settlement in which the states agreed to divide funds held in escrow from the area in dispute on a percentage basis and the federal government agreed to withdraw the lateral seaward boundary determination.

LOUISIANA

Since the late 1940's Louisiana has been in active litigation with the United States over the location of its submerged lands. Its claims of historic title to offshore areas prior to the Submerged Lands Act were denied as were its attempts to obtain the advantages of the nine mile grant under the Act. United States v. Louisiana, et al., 363 U.S. 1 (1960). Due to its very complicated shoreline, coastline delimitation questions have been considerable. Many have been litigated to a conclusion, and one has been resolved by agreement.

Chandeleur Sound is a large embayment landward of a string of thin sand islands north and east of the Mississippi River Delta. The United States has maintained that the Sound has high seas enclaves for international purposes beyond the three mile

limit. This position is reflected in the boundary lines drawn on the NOS charts. The United States has, however, accepted Louisiana's submerged lands jurisdiction over the entire Sound. United States v. Louisiana, et al., 382 U.S. 288 (1965). After proceedings before a special master, closing lines have been established by the Supreme Court for all the other embayments on the Louisiana coast, i.e., East Bay, West Bay, Ascension Bay (the large embayment formed by the west side of the Delta for which a 24 mile fall back line has been drawn), Calliou Bay and Atchafalaya Bay. United States v. Louisiana, et al., 394 U.S. 11 (1964), 420 U.S. 529 (1975). The entire coastline is now described in a Supreme Court decree. United States v. Louisiana, et al 422 U.S. 13 (1975). Future changes will require a new Court decree.

Its lateral boundaries with Mississippi (as discussed above) and Texas have also been the subject of dispute. In Texas v. Louisiana, 426 U.S. 465 (1976) (opinion), 431 U.S. 161 (1977) (decree), the Supreme Court accepted the recommendation of its special master to delimit the Louisiana-Texas maritime boundary by following the equidistant line, the line so described runs for nine miles seaward from the coastline.

TEXAS

Texas lost its claim for expansive offshore jurisdiction in the pre Submerged Lands Act case of United States v. Texas, 339 U.S. 707 (1950). Texas received the advantage of the nine mile grant of submerged lands under the Submerged Lands Act of 1953. United States v. Louisiana, et al., 363 U.S. 1 (1960). The grant is to be determined on the basis of the actual historic boundary in the Gulf of Mexico up to a maximum distance from the modern coastline of nine nautical miles. United States v. Louisiana (Texas), 383 U.S. 515 (1962); 394 U.S. 1 (1969). No other disputes over the seaward extent of its jurisdiction have arisen. The relevant coastline is formed by mean low water line and jetties along the shore. This coastline is delimited in the Supplemental Decree, United States v. Louisiana, et al., 394 U.S. 836 (1969). With the Louisiana boundary settled by litigation and the Mexican boundary by international agreement, the Texas maritime boundary appears to be fixed. *Id.*; The Treaty of Maritime Boundaries Between the United States of America and the United Mexican States, S. Exec. Doc. F, 96th Cong., 1st Sess. (1977). See Feldman and Colson, *supra* at 740-745.

CALIFORNIA

California has been involved in litigation with the federal government over its maritime limits for more than thirty years. While it lost its claims to maritime jurisdiction in the first case (United States v. California, 332 U.S. 19 (1947)) it regained much of what it sought through the three mile grant of jurisdiction in the Submerged Lands Act.

Litigation subsequent to 1953 between the federal government and California has focused on locating the coastline from which the three mile grant is to be measured. After referring the matter to a special master, the United States Supreme Court issued a major decision on these questions in 1965. United States v. California, 381 U.S. 139 (1965). That decision set out the rules for delimiting the coastline for Submerged lands Act purposes that has been applied to all of the coastal states. Based on the desire to have a single coastline for domestic and international purposes and the desire to utilize the best and most workable definitions available, the Court utilized the rules found in the Convention on the Territorial Sea and the Contiguous Zone for these purposes. It deferred to the United States in the course of finding that there was no system of straight baselines established on the California coast. *Id.* at 167-168. It applied the 24 mile closing line rule of the Convention to all bays. *Id.* at 169-175. All other water bodies that could not be closed as juridical bays or river mouths were not closed. Closing lines were not drawn for Santa Barbara Channel, the water area between Point Conception and Point Hueneme, the water areas between Point Fermin and Point Lasuen, the water area between Point Lasuen and Newport Bay, Santa Monica Bay, Crescent City Bay and San Luis Obispo Bay. United States v. California, 382 U.S. 448, 451-452 (1966) (decree).

California has also gained jurisdiction over the submerged lands within the Channel Islands National Monument. United States v. California, 436 U.S. 32 (1978). It lost a claim to include Rincon Island and 15 piers as a part of its coastline. United States v. California, 447 U.S. 1, 100 S. Ct. 994 (1980) (opinion); 101 S. Ct. 912 (1981) (decree).

California's ocean boundary with Mexico has been settled by international agreement. Treaty to Resolve Pending Boundary Differences and Maintain the Rio Grande and Colorado River as the International Boundary between the United States and Mexico, done, November 23, 1970, United States-Mexico, 23 UST 371, TIAS 7313. Its ocean boundary with Oregon, however, has not been addressed in recent years. Since the California Constitution and the Act of Admission of Oregon into the Union identify a boundary which runs for three miles due west from the shore boundary there would appear to be no basis for significant dispute. California Constitution, Art. 12, Par. 1; Act of Admission of Oregon, 11 Stat. 383 (1859). The question does arise whether or not those provisions have validity in light of the fact that prior to 1953 the states had no jurisdiction in the ocean beyond the coastline.

OREGON

Oregon's ocean jurisdiction has not been the focus of any attention in recent years. Its regular shoreline apparently eliminates any significant dispute over its coastline. The Oregon Act of Admission appears to settle its maritime boundary

with California. See discussion above. A 1958 Interstate compact with the State of Washington has delimited its maritime boundary with that state along an east-west axis out to a point "one marine league at sea off the mouth of the Columbia River" from an identified geographical point. Public Law 85-575, 72 Stat. 455 (1958). See also, 2 Oregon Revised Statutes Par. 186.510 and 186.520 and 11 Stat. 383. This line is based on the due west line described in Oregon's Act of Admission, 11 Stat. 383 (1859).

WASHINGTON

The coastline of the State of Washington facing the Pacific Ocean has not given rise to any delimitation problems. It is formed by the mean low water line and the closing lines of the major bays on the coast, all of which clearly qualify as juridical bays. The international boundary with Canada in the Strait of Juan de Fuca has been settled after much dispute. Northwest Water Boundary Protocol, done March 10, 1873, United States-Great Britain, 18 Stat. 369, TS No. 135, 12 Bevans 190. The history of the dispute is reviewed in 1 J. Moore, History and Digest of the International Arbitrations to Which the United States has been a Party 196-236 (1898). The juridical status of the waters of the Strait of Juan de Fuca and waters further inland are not firmly settled. Similarly, the boundary seaward remains an open dispute. (See Feldman and Colson, supra at 750.)

HAWAII

The island nature of the Hawaii shoreline and its extreme irregularity would appear to be the source of considerable conflict between the state and the federal government. Yet no direct dispute appears to have developed. In the case of Island Airlines, Inc. v. CAB, 352 F.2d 735 (CA 9 1965) it was argued that all the waters between the Hawaiian Islands were within State jurisdiction for the purpose of regulating inter-island airline routes. The Court found federal CAB jurisdiction existed over those routes that passed beyond the three mile limit between the islands. That limit was to be determined on the basis of the mean low water line of the islands and the closing lines of juridical bays. Since the state only appeared as amicus, it is not technically bound by the decision which essentially determined that state's territorial jurisdiction. There are indications that the State continues to assert the right to draw closing lines between the islands despite the contrary position taken by the federal government and the Court.

ALASKA

Alaska's shoreline is the longest and most complicated shoreline of any of the states. Disputes between the federal government and Alaska over the location of its coastline have

only just begun. While many areas of the state might qualify for a system of straight baselines, none has been established by the federal government. Three areas that have already been the subject of federal-state litigation have been Yakutat Bay, Cook Inlet and the north shore on the Arctic Ocean. In the Yakutat Bay case the Ninth Circuit Court of Appeals decided that the Submerged Lands Act grant was to be measured by use of the 24 mile bay closing line rule that the United States adopted after Alaska became a state. United States v. Alaska, 353 F.2d 210 (C.A.9 1965) reversing United States v. Alaska, 236 F. Supp. 388 (D. Alaska 1964). In Cook Inlet, the States claimed historic bay status for the entire bay. The Supreme Court found that it did not so qualify. The normal bay closing lines and a twenty-four mile fall back line have been established inside the bay. United States v. Alaska, 422 U.S. 184 (1974).

Off the mainland shore on the Arctic Ocean lie a number of islands that are located more than the six nautical miles from shore. The United States maintains that federal (high seas) enclaves are located between the islands because the mean low water line constitutes the coastline in the area. The state disputes this delimitation and the matter is currently in court. United States v. Alaska, U.S.S. Ct. No. 84 Original.

In a case in the Superior Court of Alaska the state asserted jurisdiction over the entire Bristol Bay. The court's unpublished decision of September 4, 1962, held that the bay was included within the waters of Alaska. Alaska v. Arctic Maid, Inc., Superior Court of Alaska, District 1, Juneau, Case Number 7093-A. Subsequently, the United States joined the case on appeal as *amicus* and filed a brief arguing that the bay was not within state jurisdiction beyond the normal baseline. The case was settled before the matter was addressed by the Court of Appeals. A prior decision by the United States Supreme Court in the same case avoided the issue. Alaska v. Arctic Maid, Inc., 366 U.S. 199 (1961). State jurisdiction in this bay and in the waters of the Alexander Archipelago, among many others, remains open to future litigation.

Alaska has no boundaries, land or water, with any other state of the United States. The international boundary with Canada at Dixon Entrance is not completely settled nor is the boundary in the Arctic Ocean. Feldman and Colson, *supra* at 750. The same appears to be true in the case of the boundary with the U.S.S.R. off of the Diomedé Island. *id.*

ANNEX II

The Status of the Boundaries in the Seas of the Provinces of Canada

BRITISH COLUMBIA

Litigation over the offshore jurisdiction of British Columbia dates back at least to the 1914 Privy Council case of Atty-Gen. for B.C. v. Atty-Gen. for Canada: (Reference re B.C. Fisheries) [1914] 5 WWR 878, [1914] AC 153, 83 LJPC 169, 26 WLR 347. In that case, the Privy Council avoided answering the question. In the 1967 Reference to the Supreme Court of Canada, discussed in the text at Section II.B., British Columbia's claims to jurisdiction over the territorial sea and continental shelf adjacent to its shores were denied. The landward limit of that decision, however, is unclear. The British Columbia Court of Appeals did address this issue in the Strait of Georgia Reference. The Court held that the territory of British Columbia includes the series of straits that separate Vancouver Island from the mainland -- Strait of Juan de Fuca, Strait of Georgia, Johnstone Strait and Queen Charlotte Strait. Canada has not closed this area with a system of straight baselines but apparently claims the area as historic internal waters. The theory used by the Court to decide that these water areas are internal waters is not clear. See text at Section II.B. Thus, it is not clear whether it is the common law or modern international law that fixes the boundary between federal and provincial jurisdiction. Since this case will now be considered on appeal by the Supreme Court of Canada, the question may soon be resolved. In the meantime, the federal-provincial boundary along the entire British Columbia coast remains undetermined.

At the northern and southern extremes, the coastline of British Columbia meets the coastline of the United States. Accordingly, the lateral ocean boundaries of this Province are international boundaries, not inter-provincial. These boundaries are discussed in the context of the Washington and Alaska boundaries.

MANITOBA

Manitoba is located on the southwestern shore of Hudson Bay. The jurisdiction of Canada over that bay and its entrance via the Hudson Strait has been a matter of great interest. Canada, and the United Kingdom before it, have claimed jurisdiction over those waters despite objections from some countries including the United States. Accordingly, the status of these waters as historic waters of Canada remains a matter of some question. (See, L. Bouchez, The Regime of Bays in International Law 229-30 (1964); M. Strohl, The International Law of Bays, 232-250 (1963); and U.N. Conference on the Law of the Sea, Memorandum Prepared by the Secretariat of the U.N.,

Historic Bays, UNCLOS I Preparatory Document No. 1, UNCLOS I O.R. Vol. 1, U.N. Doc. A/Conf. 13/137 (1958) p. 1, 6. (Hereinafter "UNCLOS I, Historic Bays")).

Manitoba took no part in the 1967 Reference since it apparently claims no offshore jurisdiction. Its boundary statute describes the boundary as running along the shore of Hudson Bay. Chapter 18, Revised Statutes of Manitoba 1913. Manitoba and Canada have agreed that the provincial jurisdiction extends to the mean low water mark.

ONTARIO

As is the situation for Manitoba, Ontario fronts on Hudson Bay. It also shares the coast of James Bay with Quebec. Ontario does not claim any of the waters of these bays, although it has made some effort in conjunction with its neighbors to obtain offshore jurisdiction. Accordingly, its jurisdiction appears to stop at the shoreline, which is probably delimited by use of the mean low water line as is that of its neighbors.

QUEBEC

Quebec has a long and varied coastline that faces on a number of water bodies. The position of Quebec as to its offshore jurisdiction differs considerably from area to area.

On the northwest, Quebec fronts on Hudson Bay, James Bay, Hudson Strait, and Ungava Bay. The status of Hudson Bay area under international law is discussed above in the section on Manitoba. All of these water areas are very large and would not qualify as internal waters by using normal baseline rules. No system of straight baselines has been established to close these areas. Quebec recognizes that currently its boundary in these areas runs along the shore. This position appears to have been dictated by the relevant boundary statutes. ("... shore to the mouth of the Eastman River ..." (Can., 61 Vlct., chap. 3 (1898) and Que., 61 Vlct., chap. 6 (1898) and "... the shore ... to the border under the legal jurisdiction of Newfoundland ..." ((Can. 2 Geo. V., chap. 45 (1912) and (Que., 2 Geo. V., chap. 7 (1912), 1st session)). Quebec and Canada have entered into two agreements to define the shore. An agreement of August 28, 1975, defines the shore as the low water line. Rivers will be closed at their mouths according to an agreement of March 5, 1976. I understand that Quebec along with Manitoba and Ontario have submitted several proposals to the federal government seeking a political decision to extend their northern boundaries to the middle of James and Hudson Bays.

To the east Quebec faces the Gulf of Saint Lawrence as do the Provinces of Newfoundland, New Brunswick, Nova Scotia and Prince Edward Island. All of these Provinces have maintained for some time that the Gulf is included within their respective territories as historic waters of Canada and the provinces. Bouchez discusses the status of the Gulf under international law and concludes on the basis of a 1763 treaty between the United

Kingdom and France, "It is evident that the Gulf of St. Lawrence was not claimed by the British, neither as part of Canadian Territory nor as an exclusive fishery area for the local population." (Bouchez, *supra*, at 82.) Even if the Gulf is Canadian, it is not clear that the rationale of the 1967 Reference and the Strait of Georgia Reference would require that these waters were within the territories of the littoral provinces.

Nearer to shore there are closing lines of two water bodies that are not controversial. It would appear that the Royal Proclamation of October 7, 1763, drawing a closing line across the mouth of the Saint Lawrence River (R.S.C. 1970, App. p. 123) would mark the seaward limit of Quebec's jurisdiction in the absence of more expansive jurisdiction over the Gulf. The internal water status of Chaleur Bay which Quebec shares with New Brunswick was indicated by the opinion in the case of United States-Great Britain, In the Matter of the North Atlantic Coast Fisheries, 4 Amer. J. Int'l Law 948, 984 (1910). (See also UNCLOS I, Historic Bays at 3). That opinion probably fixes the provincial boundary at the closing line described as "the line under international law the Light at Birch Point on Mascon Island to Macquereau Point Light." *Id.* While the expansion of bay closing lines under international law to 24 nautical miles might have moved Canadian federal jurisdiction seaward, it is not clear that the closing lines for this and other bays along the coast would be so affected for provincial jurisdiction purposes.

Since Quebec does not currently claim jurisdiction in the waters on its northern and western boundary, it has not promulgated official Provincial lateral boundary lines in those waters. The contrary is true for the Gulf of Saint Lawrence. As discussed in the Introduction to the Canadian section of this paper, Section II.B., Quebec was associated with the 1964 effort by the Premiers of the Maritime Provinces to obtain federal recognition of their offshore jurisdiction. Their submission contains a detailed description of interprovincial water boundaries in the disputed waters, including the Gulf of Saint Lawrence and Chaleur Bay (as well as the Bay of Fundy). As recently as 1980, the Government of Quebec published a map showing the 1964 lines as interprovincial boundaries. (Le Quebec Meridional, 1:2,500,000, Service de la Cartographie, Ministere de l'Energie et des Ressources, Gouvernement de Quebec). The map illustrates the 1964 interprovincial Agreement Lines which purport to delimit Quebec's water boundaries with Newfoundland, Nova Scotia, Prince Edward Island and New Brunswick. Although no province has denounced this agreement, there has been no provincial or federal legislation implementing it. Perhaps the only exception to this situation is in the case of the line in the interior of Chaleur Bay which has been previously described in 1851 (U.K., 14-15 Vict., chap. 43 (1851)).

The 1964 interprovincial Agreement did not delimit Quebec's boundary with Labrador (Newfoundland). Quebec's maritime

boundary map does depict such a boundary line at the northern end of the Gulf of Saint Lawrence as a straight line extension of the land boundary running due south. The 1964 Interprovincial Agreement, however, does not describe this line as a boundary. Rather, it is used only to identify the terminal point of the 1964 line to the south. Newfoundland's position on this matter is unknown. No water boundary appears to have been developed for the northern Labrador-Quebec boundary at the mouth of Hudson Strait.

NEWFOUNDLAND

Newfoundland is actively pursuing efforts to obtain recognition for its expansive claims of offshore jurisdiction. The question of Newfoundland's offshore jurisdiction has been raised in three recent cases. In a matter before the Canadian labour Relations Board this jurisdictional issue was raised in the context of the certification of a labor union. The Board avoided deciding the offshore jurisdiction issue as did the Federal Court of Appeal. Canadian Merchant Service Guild et al v. Crosbie Offshore Services, Ltd., Canadian Labour Relations Board, Decision Number 291 (December 30, 1981); Seafarers' International Union of Canada v. Crosbie Offshore Services, Ltd., et al., Federal Court of Appeal of Canada Case Number A-2-81, Judgment Rendered at Ottawa, March 5, 1982. On February 12, 1982, the Lieutenant Governor in Council of Newfoundland, by order in Council No. 135-'82, referred to the Court of Appeal of the Supreme Court of Newfoundland a question seeking determination of Newfoundland's offshore jurisdiction. Essentially the same question was asked in respect of a small area of the Newfoundland coast in the Atlantic Ocean identified as the Hibernia Area by the federal government in its reference of May 19, 1982, to the Supreme Court of Canada (P.C. 1982-1509). (The basis for these claims are discussed in C. Douglas, "Conflicting Claims to Oil and Natural Gas Resources off the Eastern Coast of Canada", 18 Alberta L.R. 54 (1980) and H. W. MacLauchlan, "Newfoundland's Continental Shelf: The Jurisdictional Issue", 30 N. Brunswick L.J. 91 (1981).) Newfoundland's claims extend eastward into the Atlantic and westward into the Gulf of St. Lawrence to the Interprovincial Lines set out in the 1964 Interprovincial Agreement. Notwithstanding these claims, it has three recognized historic bays along its coasts. The status of Fortune Bay and Placentia Bay were recognized in the North Atlantic Coast Fisheries case. The Supreme Court of Newfoundland established Conception Bay as an historic bay in United States Cable Co. v. Anglo-American Telegraph Co., (1877) 2 App. Cas 394, 46 L.J.P.C. 71. (See also UNCLoS I, Historic Bays at 4.) The validity of that decision was discussed with approval in the 1967 Reference (at pp. 36-37). All of these bays would now be closed for international purposes by a use of a 24 nautical mile closing line, at least. Whether or not the provincial boundary would run to this modern closing line is an open question.

As mentioned above, Newfoundland was a party to the 1964 Interprovincial Agreement delimiting offshore boundaries. Thus, the boundaries it claims with Nova Scotia and Quebec in the Gulf of St. Lawrence do not appear to be in dispute. As discussed in the context of Quebec's boundaries, the boundaries off of Labrador have not been developed.

PRINCE EDWARD ISLAND

Prince Edward Island claims jurisdiction in the waters of the Gulf of Saint Lawrence and Northumberland Strait up to the 1964 Interprovincial Lines. As discussed in the review of the Quebec claims, the status of the Gulf of Saint Lawrence is questionable. It would appear that if the Gulf were found to be internal waters of the provinces, the Strait would have to be included. The internal water status of the Strait, independent of the Gulf, has not been the subject of litigation. It would appear that the rationale of the Georgia Strait Reference might be used to support a finding of internal water status of this Strait. It may be possible to designate these waters as internal waters by the current international law rule that permits the use of the 24 nautical mile fall back line within an over large bay. Within the Strait is Egmont Bay which was found to be an historic bay in the North Atlantic Coast Fisheries Arbitration. In the Prince Edward Island case of Gavin v. The Queen, (1956) 3 DLR (2d) 547, however, the Supreme Court of that province held that the realm ended at the low water mark. As a party to the 1964 Interprovincial Agreement, Prince Edward Island appears to have no dispute with its neighbors, Quebec, New Brunswick and Nova Scotia, over the location of their mutual offshore boundary lines. This assumes, of course, that these provinces do have territorial jurisdiction that extends to these lines.

NEW BRUNSWICK

New Brunswick claims full jurisdiction in the waters adjacent to its shores up to the boundaries described in the 1964 Interprovincial Agreement. The status of the claim in the Gulf of Saint Lawrence and Northumberland Strait has already been discussed in the sections on Quebec and Prince Edward Island. Miramichi Bay is located on the New Brunswick coast along the Gulf of Saint Lawrence. The Permanent Court of Arbitration in the North Atlantic Coast Fisheries Arbitration considered that bay to be Canadian. (4 Amer. J. Int'l Law 948 at 984 (1910). See also UNCLoS I, Historic Bays at 6). Since its closing line is only 14 1/2 miles long it now qualifies as a juridical bay under modern rules of international law.

As is the case of the Gulf of Saint Lawrence, the status of the Bay of Fundy is a matter of some dispute. (See LaForest, "Canadian Inland Waters of the Atlantic Provinces and the Bay of Fundy Incident" 1 Can. Y.B. Int'l Law 149 (1963)). The claim of jurisdiction by the United Kingdom over that bay gave rise to a

dispute with the United States before the Anglo American Claims Commission established by an 1853 convention between these states. The Commission applied an 1818 treaty between the disputants and existing international law. As a consequence, it denied the United Kingdom's claim to sovereignty over the bay. (See Bouchez, *supra* at p. 46, Stohl, *supra*, at 380-383.)

The Supreme Court of Canada seems to have expressed a different opinion on the matter in the 1967 Reference. In the course of its analysis of the issues in that reference, it discussed the case of Rex v. Burr, (1932) 5 M.P.R. 112 (N.B. C.A.), which involved the seizure of a ship one and three-quarters miles from shore in the Bay of Fundy off of Chance Harbour. The brief discussion implies that the Supreme Court of Canada accepted the view that the Bay of Fundy is an historic bay and is within the territory of New Brunswick. 1967 Reference at p. 37. New Brunswick maintains that this is the correct view of the status of the Bay of Fundy.

While the water boundary in the Bay of Fundy between New Brunswick and Nova Scotia has never been officially delimited, New Brunswick maintains that the 1964 Interprovincial Agreement correctly delimits the boundary line in the area. Since Nova Scotia is a party to that agreement and apparently continues to abide by it, the 1964 line appears to have settled that matter for the present.

NOVA SCOTIA

As in the cases of the other Maritime Provinces, Nova Scotia has claimed expansive offshore jurisdiction. Since it continues to utilize the 1964 Interprovincial Lines in its publications, the limits of its claims in the Gulf of Saint Lawrence and Bay of Fundy, as well as a portion of the area in the Atlantic adjacent to Newfoundland, are known. See, Offshore Oil & Gas A Chance for Nova Scotians, Nova Scotia Department of Mines and Energy (2d Printing March 1981). It has also made seaward claims in the Atlantic Ocean which appear to run to the limit of the continental shelf. *Id.* On March 2, 1982, the Governments of Canada and Nova Scotia entered into an agreement entitled, "Canada-Nova Scotia Agreement on Offshore Oil and Gas Resource Management and Revenue Sharing." This agreement establishes joint management and revenue sharing for oil and gas development in the seabed off of Nova Scotia. Legislation will have to be enacted by both governments in order to implement the agreement. By express provision in the introduction to the agreement the question of the legal jurisdiction of the parties in the area subject to the agreement is left open. The geographical scope of the agreement includes the continental shelf adjacent to Nova Scotia in the Atlantic Ocean and the Gulf of Saint Lawrence. The Bay of Fundy does not appear to have been included within the scope of the agreement. Where relevant, the 1964 Interprovincial Agreement Lines are also used to delimit the area covered by this agreement.

There are a number of bays along Nova Scotia's coast that are admittedly historic bays. Barrington Bay, Chedabucto, and Saint Peter's Bays were considered by the Permanent Court of Arbitration to be Canadian bays in its decision in the North Atlantic Coast Fisheries Arbitration, 4 Amer. J. Int'l Law 948, 984 (1910).

As was discussed in the sections on Quebec, Prince Edward Island, and New Brunswick, the status of the Gulf of Saint Lawrence, Northumberland Strait, and the Bay of Fundy, respectively, is a matter of some question. There is a court opinion referred to in the 1967 Reference that appears to be adverse to the claims of Nova Scotia. The majority in Re Dominion Coal Co. and County of Cape Breton; Re N.S. Steel & Coal Co. and County of Cape Breton, (1963) 48 M.P.R. 174, (1963) 40 D.L.R. (2d) 593 (N.S. C.A.) found that the Spanish Bay was not inland waters for the purpose of municipal taxation. Two of the members of the court discussed the wider issue of the offshore jurisdiction of the Province. MacDonald, J., relied heavily on the English Case of Reg. v. Keyn; The 'Franconia', (1876) 2 Ex. D. 63, 46 L.J.M.C. 17, which articulated the common law rule that the territory of the realm ends at the low-water mark. The Court in the 1967 Reference used that discussion as the basis for examining Reg. v. Keyn. That analysis formed a foundation for the Supreme Court of Canada's opinion, denying British Columbia its offshore claims. This would not appear to bode well for the Nova Scotia offshore claims. (For a thorough discussion of Nova Scotia's claims to offshore jurisdiction, see E. Foley, "Nova Scotia's Case for Coastal and Offshore Resources," 13 Ottawa Law R. 281 (1981).)

CHINA'S OFFSHORE OIL DEVELOPMENT: PROBLEMS AND PROSPECTS

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INTRODUCTION

China has now embarked on a full-scale development of offshore petroleum resources on its continental shelf, and preparations are well underway to invite U.S. and foreign oil companies to invest in its offshore petroleum development program. Foreign investment will necessarily involve technological, economic, and legal considerations. In order to cope with this fast developing situation, China promulgated its offshore petroleum law on February 10, 1982, called "Regulations of Offshore Petroleum Resources in Cooperation with Foreign Enterprises" (hereinafter referred to as the "Regulations"). The Regulations, broad and general as they are, are nevertheless China's first mineral code, and as such their significance cannot be minimized.

There are several factors which motivated China to invest in the offshore oil exploration and development. First, with the onshore resources located near the industrial centers in eastern and northeastern parts of China rapidly being depleted, China has to turn to inaccessible interior regions in the west where the largest portion of onshore reserves are believed to exist. However, the rough terrain and harsh climate in these areas make the exploitation extremely difficult and costly. The capital investment in such an exploitation project would be no less than the offshore investment. China has an estimated 30 to 60 billion tons of oil reserves, of which land reserves account for about two-thirds. There are more than 300 sedimentary basins, most of which are over 3,000 meters in thickness. More than 400 possible oil-bearing structures of various types have been found in the South China Sea and the southern waters of the Yellow Sea. Both the Chinese and foreign geologists unanimously believe that oil reserves in these waters are very rich and that there are good prospects for oil exploitation [1]. These offshore oil resources are mostly located in shallow-water areas off the Chinese coast where the average depth of water ranges from 26 to 70 meters. Hence, the offshore exploration and production operations would not be more expensive than onshore operations in China's remote west. Second, China's modernization needs substantial foreign exchange, and oil offers the greatest possibilities for earning foreign currency to finance the import of technology. Third, China has to cope with its burgeoning energy needs in industry as well as in agriculture. Farm mechanization would not be possible without diesel oil. Energy consumption tripled from 1970 to 1979 in the

agricultural sector. Fourth, oil is a vital strategic material. China's present major oilfields are mostly concentrated in the northwest and northeast regions near the Soviet border where vulnerability to attacks by the Russians is evident. The establishment of offshore oilfields will reduce China's energy vulnerability. Fifth, offshore oil fields are close to the industrial centers and seaports, thus facilitating oil transportation for domestic use as well as for export. Sixth, there are indications that the viscosity of the offshore oil may be better than onshore crude, which tends to have a high-wax content and a very high heavy oil factor. Lastly, offshore oil development with the participation of U.S. and foreign oil companies could be an effective way of staking out China's claims to disputed areas in the China Seas. It is against the above background that China finally decided to go ahead with its offshore petroleum development program. The World Bank recently predicted that without offshore oil production China might have to import crude by 1985 [2].

Because of China's limited technical capabilities and economic constraints, it is almost impossible for her, alone and unassisted, to produce oil from the offshore seabed efficiently and expeditiously. Foreign technological investment is necessary. China is now pursuing an "open door" policy on petroleum development, both onshore and offshore. One of the primary aims of the newly promulgated Chinese offshore petroleum regulations is to insure adequate legal protection to foreign oil investors who apparently would not invest in such a multi-billion-dollar project without first being assured of full protection of their interests by law.

CHINA'S OFFSHORE PETROLEUM RESOURCES REGULATIONS

The Regulations establish a broad framework of principles and guidelines aiming at speeding up the exploration and exploitation of offshore petroleum resources with the assistance of foreign investment and technology. They provide for safeguarding China's sovereignty over its petroleum resources and at the same time extend full protection to foreign investment and legitimate interests. Detailed rules and regulations will be promulgated from time to time governing all aspects of petroleum operations on the continental shelf.

The crucial issue involved in any petroleum legislation involving foreign participation is how to strike a reasonable balance between the interests of the host country and those of the international oil company. As the modern trend is toward an increasing governmental role in the management of offshore oil and gas resources, the crux of the question is how to select the most suitable form of government participation. China is a socialist country. All the natural resources are owned and controlled by the State. The primary consideration for China in its cooperation with foreign oil companies has been the assurance of exclusive control over the natural resources within its jurisdiction and the implementation of a self-reliance

policy in the development of such resources. According to the Regulations, the self-reliance policy is to be implemented through mandatory transfer of technology, employment and training of Chinese personnel, and purchase of equipment from Chinese suppliers if their services are competitive, as provided in Articles 12, 19, 20, and 21 of the Regulations. Given China's present political system and its energy policy, the most appropriate form of government participation will be the joint venture or production sharing formula. Both of them assure the host country of maximum control over its resources.

Overall, the Chinese offshore petroleum law has managed to strike a reasonable balance of interests between China as the host country on the one hand and international oil companies as contractors on the other. The law has assured foreign investors of full protection of their rights and interests in this highly risky venture. As we know, the participation of foreign interests in China's cooperative venture involves not only financial risks as such, but more serious political risks as well. The political climate is so important in a cooperative venture of this nature that only when political stability and peace can be reasonably assured for a considerable period of time could there be any meaningful, long-term commitment of foreign capital in the development of petroleum resources in China's offshore seabeds. In this respect, the limit of China's jurisdiction over its offshore petroleum resources is a major problem that has yet to be settled among its coastal neighbors in the region.

POLICY OBJECTIVES

The policy objectives of the Chinese offshore petroleum law can be summarized as follows:

- (1) To achieve the maximum possible oil recovery to meet the nation's energy needs and increase reserves of the petroleum resources;
- (2) To utilize as much as possible foreign capital and technology to expedite the exploration and development of petroleum resources;
- (3) To reduce to the minimum obstructions to and interferences with the marine environment;
- (4) To train Chinese technical and management personnel for eventual takeover of petroleum operations [3].

It can be easily seen that China plans to achieve expedited exploration and development of the shelf resources through maximum utilization of foreign capital and technology. Since the mining business is a highly risky enterprise, it is extremely important that the law be made sufficiently attractive in its terms and conditions in order to entice foreign capital to invest in it instead of in other less risky businesses. Exploration risks must be taken into account in contracts, and foreign interests adequately protected through legislation in

order to encourage foreign investment. To this end Article 3 of the Regulations expressly guarantees protection of "foreign investments in the exploitation of offshore petroleum resources, their share of profit, and other legitimate rights and interests ..." It further provides for tax exemptions or reductions for imported equipment and materials. The tax exemption provision is apparently aimed at facilitating transfer of foreign technology to the Chinese and will also be beneficial to foreign contractors. However, the provision could have negative effects on the competitiveness of Chinese made equipment and materials which the present law attempts to protect, as can be seen in Articles 19 through 21. Thus there is a clear indication that China wishes to have technology transfer take precedence over the marketing of her own products. China is, of course, well aware that in the initial stage this contradiction might not be very acute, since most of the technology used in the offshore operations is high technology which the Chinese may not be able to manufacture at the present time or manufacture at competitive cost.

In planning its exploration and development programs the host country should have as its principal goal the long term objective of finding and developing adequate petroleum reserves, not the short-run maximizing of national income. It is interesting in this connection to note the recommendation of the U.S. Marine Science Commission in respect of petroleum development policy:

The Commission recommends that leasing and regulatory policy for offshore oil be geared to a rate of development reflecting all aspects of national interests. Strong support should be given to accomplishing the analysis necessary to provide a basis for decisions on development rates [4].

Because of the urgency of China's need to develop both onshore and offshore petroleum resources, the warning against a short-range view in planning petroleum development seems particularly important and timely. For China, the first and foremost policy consideration now is how to expedite the exploration and development of petroleum resources, both for economic and national security purposes. The Chinese government may look at the development of her continental shelf resources as an important source for increasing the short term supply of domestic oil to meet her burgeoning energy needs and obtaining foreign exchange through petroleum exports. The promulgation of the Chinese offshore petroleum law is an important step toward that goal. After all, the ultimate test of the effectiveness of any mineral law is whether or not it succeeds in bringing about the "maximum ultimate recovery of the resource, at the time when it is needed, and at costs which the contemporary economy can afford -- in other words, maximum economic recovery, the maximum addition to the resource base of the host nation's economy" [5].

MARITIME BOUNDARY PROBLEMS

In Northeast Asia, China has maritime boundary and territorial disputes with Korea and Japan. The delimitation of the shelf between China and Korea is less complicated, because they share the same geographical shelf in the Yellow Sea and the islands of both states are situated quite close to their mainlands. The question of delimitation between China and Japan is more complicated, because it involves the question of baselines, and the status to be given to offshore islands and the Okinawa Trough, as well as the territorial dispute over the Tiaoyutai (Senkaku) Islands.

In Southeast Asia, the potential conflict over access to mineral resources in the South China Sea is much more acute and complicated, because territorial disputes in this area involve a larger number of countries. China and Vietnam are two major claimants in this area, because of the territorial dispute over the Xisha (Paracel) and Nansha (Spratly) Islands. The recent visit to Xisha Islands by two Chinese top-ranking generals should be looked upon as declaring once again the Xisha Islands as the sacred territory of China which is not to be encroached upon.

On the question of delimitation, China insists on the natural prolongation of land territory theory, while Japan adheres to the median line principle. As to Korea, it adopts both methods and applies whichever is more advantageous to its boundary delimitation. The delimitation problem in the region is made more complicated by the introduction of the 200-mile exclusive economic zone into the law of the sea. This new concept affects adversely Chinese claims based on geomorphological and geological criteria while reinforcing Japan's claim to the continental shelf in the East China Sea.

The Chinese position on the continental shelf can be succinctly summarized as follows:

- a) China is in favor of the natural prolongation of land territory theory advanced by the International Court of Justice in the North Sea Continental Shelf Cases;
- b) China maintains that a coastal state has the right to exercise its sovereign discretion in setting reasonable limits on its continental shelf;
- c) China recognizes the necessity of setting maximum limits to the shelf claimed, and such limits may be greater than the 200 nautical miles economic zone if its geographical conditions warrant such an extension;
- d) The maximum limits of the continental shelf are to be determined through negotiations. However, no explicit reference has been made to the method of determining such limits, whether by depth, distance, or the exploitability test [6].

With regard to shelf delimitation, the Chinese Working Paper 1 submitted to the Second Subcommittee of the United Nations Seabed Committee in 1973 declares:

States adjacent or opposite to each other, the continental shelves of which connect together, shall jointly determine the delimitation of the limits of jurisdiction of the continental shelves through consultation on an equal footing [7].

It goes on to say:

States adjacent or opposite to each other, the continental shelves of which connect together shall, on the basis of safeguarding and respecting the sovereignty of each other, conduct necessary consultation to work out reasonable solutions for the exploitation, regulation and other matters relating to the natural resources in their contiguous parts of the continental shelves [8].

The Chinese views are in line with the 1958 Geneva Convention on the Continental Shelf and with the new Draft Convention on the Law of the Sea, which both call on states to settle their shelf boundary problems by negotiations, but they differ significantly from the former in that China does not concede the application of the equidistance rule failing agreement and in the absence of special circumstances. Considering the general attitude taken by the Chinese government on the question of the continental shelf, it can be safely inferred that the natural prolongation principle of the North Sea Cases will be China's primary argument in negotiating an agreement on delimitation of the continental shelf. The Chinese favor the natural prolongation theory so much that Chinese scholars have suggested inclusion of the following clause in any future convention on the continental shelf with respect to the shelf delimitation:

The delimitation of the continental shelf between states with opposite or adjacent coasts should be effected through agreement under the guiding principle of natural prolongation and in accordance with equitable principle, taking into account all relevant circumstances [9].

They have also suggested the use of a compromise clause in addition to the above:

A joint management or development regime might be established in the disputed area of the continental shelf between the parties concerned as a modus vivendi pending agreement on delimitation, or as a substitute for the delimitation of the said area [10].

It is quite evident that the Chinese are attempting to make the natural prolongation theory a rule of international law binding on all states.

international law has thus far provided no specific rules governing the delimitation of sea boundaries. The application of the equidistance principle which was stipulated in Article 6 of the 1958 Geneva Convention on the Continental Shelf was greatly limited by the International Court of Justice decision in the North Sea Continental Shelf cases, which ruled that the equidistance rule of boundary delimitation was not a rule of customary international law, and therefore could not bind states which had not ratified the 1958 Convention on the Continental Shelf.

The new Draft Convention does not seem to offer much help in the resolution of boundary disputes. Article 83 of the Draft Convention calls for an equitable solution of boundary problems through agreement on the basis of international law, an idea that was already embodied in the Chinese working paper submitted to Subcommittee II of the UN Seabed Committee as early as 1973. In another PRC statement, China's application of international law to the delimitation of economic zones and continental shelves is more clearly articulated. It says:

Each side shall respect the other side's sovereignty over its twelve-nautical mile territorial sea, and the two sides shall demarcate their respective economic zones and continental shelves in the Beibu Gulf and other sea area in a fair and reasonable way in accordance with the relevant principle of PRESENT DAY international law of the sea. (emphasis added) [11]

The wording "present day" should be emphasized, because China seems to draw a line of demarcation between traditional and contemporary international law of the sea. The former is regarded as having been formulated under the influence of the great sea powers of the time and therefore not in the interests of the majority of nation states today.

THE TROUBLE SPOTS

China has set no limit yet to its jurisdiction over the continental shelf, nor has she concluded any maritime boundary agreements with her neighbors. Conflicting claims in the Yellow, East and South China Seas have been made by Japan, Korea, Vietnam and the Philippines. China had protested strongly against the Korean-Japanese joint development plan in the East China Sea in February 1974, stating that "the question of how to divide the continental shelf in the East China Sea should be decided by China and the other countries through consultation" [12]. China had made a similar protest in March 1973, when a U.S. chartered oil drilling vessel appeared in the East China Sea, stating that the areas in the Yellow and East China Seas have not yet been delimited and that the Chinese government reserves all rights in view of the possible consequences arising therefrom. Such protests cannot be taken lightly when seen against the background of China's military

action against South Vietnamese vessels off the Xisha (Paracels) Islands on January 19, 1974.

In the Yellow and East China Seas, the risk of a direct conflict with coastal neighbors is much less acute. This is due partly to the geographical characteristics of the region, such as a more extensive shelf and the presence of offshore islands much closer to the mainlands, but also and more importantly due to the good relationship between the two major powers, China and Japan, which is a decisive factor in maintaining peace and security in the whole of East Asia and in this region in particular.

Soviet involvement in the South China Sea complicates the situation. The Soviet Union is trying to extend its influence in the region through participation in offshore oil exploration and development, and it has succeeded in doing so not long ago by entering into a joint exploration agreement with Vietnam in the Beibu Gulf (the Gulf of Tonkin) [13]. As Vietnam has awarded seismic and exploration contracts to foreign firms covering the area between Mekong Delta and the Nansha (Spratly) Islands, China is faced with possible conflict with Vietnam as China's territorial claims cover the entire South China Sea from Hainan Island to the coast of Kalimantan.

The situation in the Beibu Gulf is potentially explosive. In 1979 two oil company supply boats were fired on by one of the Vietnamese vessels shortly after China granted seismic survey contracts to several U.S. oil corporations. Although the areas that will be awarded by the Chinese to foreign oil companies are located just beyond the disputed rectangular area formed by the 18th and 20th parallels and 107th and 108th meridians, an area believed to contain an oil reservoir, a possible confrontation exists once exploration activities begin. If oil is struck near the dividing line, there would probably be a common pool, and even if the oil rig is on the undisputed side, oil still can be drawn from the oil reservoir straddling the common boundary. Thus it can be easily seen that the area around the Hainan Island, especially the Beibu Gulf, is a trouble spot likely to trigger a confrontation at any moment. Some foreign analysts believe that if fighting should break out again between China and Vietnam, it may extend to the sea.

CHINA'S OPTIONS

Pending solution of boundary and territorial disputes in the region, China is faced with two options. One is the joint development plan. But that requires the participating countries to adopt a realistic, lenient, and flexible policy toward each other, recognizing the political reality in the region and eliminating hostility against each other. Of course, the joint development plan involves the complex problem of how to allocate revenues among the participating countries. However, it is a question of an entirely different nature on which compromises can be more easily reached. Given the present political status quo in the China Seas region, this option is severely limited

except in cases where the existing bilateral relationship is sufficiently harmonious to make such cooperation politically feasible.

The second option open to China is to explore and develop petroleum resources in undisputed near-shore waters. This is of course only a temporary measure that does not solve the real problem. The boundary problem will loom large as offshore development advances seaward. China seems to have chosen this option. On China's part, she is very anxious to settle the boundary and territorial disputes with her neighbours, especially Vietnam, in the South China Sea and the Beibu Gulf in particular, since offshore oil development is now being actively promoted and implemented. China put forward an eight-point peace proposal to Vietnam shortly after the Sino-Vietnamese armed conflict in February 1979 calling for mutual consultations concerning sea boundary delimitations in the Beibu Gulf and other sea areas in the South China Sea [14], but consultations have not yet resulted in any arrangements.

OBSERVATIONS

The maritime boundary issue is the biggest problem China now faces in its offshore oil development. Whether China's ambitious offshore development program will turn out a success or failure will in large measure depend on how this tough issue can be resolved. The difficulty lies not so much in its legal, geographical or geological complexities as in the stark political reality of the region that virtually defies any conceivable solution. The impact of China's offshore oil development on its neighboring coastal states in terms of military conflict will have to be assessed in light of the great power relationship in the Far East, namely, the four-power relationship of China, Japan, the United States, and the USSR. As China is a major power in world politics, its political inclination will have significant effects on the balance of power in the world and in Asia in particular. Japan is the key link in the emerging Beijing-Tokyo-Washington alliance. The decisive role Japan can play in the formation of such an alliance is evident. In this connection, it might be pointed out that the interplay of great power relationships, particularly in the management of petroleum resources as an instrument of foreign policy, weighs heavily in the trend of events in the Asian-Pacific region. These energy-related issues cannot be separated from strategic and political issues, and economics and politics are closely linked in Chinese Communist ideology. China's oil policy is largely dictated by its foreign policy objectives and in turn serves its global strategy. This is fully borne out by its energy policy toward those Asian countries which China regards as important to the implementation of its foreign policy objectives in the world political arena. These countries obtained Chinese oil at a so-called "friendship price", which was lower than the OPEC price. China's policy of supplying oil to Japan stems from the same consideration.

Overall, the prospect for settlement of boundary and territorial disputes in the China Seas still looks very gloomy. Given the complexity of the world situation as it exists today, and with the U.S. pursuing a two-China policy and the USSR colluding with Vietnam in its expansion policy, a resolution of maritime boundary disputes in the region seems very remote.

NOTES

1. Foreign Broadcast Information Service (FBIS), January 7, K4, April 6, K17, and April 22, K 10, 1982.
2. Oil & Gas Journal, November 9, 1981 at 124.
3. Regulations of the PRC on the Exploitation of Offshore Petroleum Resources in Cooperation with Foreign Enterprises (hereinafter cited as Regulations), Art. 1, 7, 10, 12, 16, 18, & 24.
4. Report of the U.S. Marine Science Commission, Our Nation and the Sea, at 127 (1969).
5. Northcutt Ely, "Policy Considerations in the Development of Mineral Laws", 3 Natural Resources Journal, 282 (1970).
6. U.N. Doc. A/AC.138/SR. 72 (1972); U.N. Doc. A/AC.138/SC 11/L. 34 (1973).
7. U.N. Doc. A/AC.138/SC 11/L. 34 (1973).
8. Id.
9. Shao Jin, Decision of the International Court of Justice on the North Sea Continental Shelf Cases and the Principle of Continental Shelf Delimitation, Beijindaxue Xuebao (Peking University Journal), N.2, 1980 at 36 (the English translation is the author's).
10. Id.
11. It was an eight-point peace proposal made by China to Vietnam following the Sino-Vietnamese armed conflict in February 1979, Beijing Rev., May 4, 1979, at 10-18.
12. Hsinhua Weekly, February 11, 1974 at 27.
13. An agreement was entered into between Vietnam and five Comecon partners -- the U.S.S.R., Bulgaria, Czechoslovakia, Hungary, and Poland -- to help Vietnam explore for oil and other resources in this area for a period of 10 years from 1981 to 1990. See Lauriat, G. & Liu, M., "Pouring Trouble on Oily Waters", Far Eastern Econ. Rev., September 28, 1979 at 20.
14. Supra note 11.

INTERPRETATION OF THE UNCLOS III DEFINITION
OF THE CONTINENTAL SHELF

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In March 1980, Ambassador Andres Aguilar of Venezuela, Chairman of the Second Committee of the Third United Nations Conference on the Law of the Sea, introduced a revision of Article 76 of the Informal Composite Negotiating Text, Revision 2, on the definition of the continental shelf. It came after several years of negotiations during which states with wide continental margins (the "margineers," as they called themselves) sought to have national jurisdiction over sea-bottom resources extend over as much of the continental margins as possible; and others, notably the Arab group and the Soviet Union, sought to have a finite mileage limit placed on the outer limit of coastal state jurisdiction. The negotiations had led to the initial preparation of the first few paragraphs of Article 76 giving coastal states jurisdiction over the full continental margin, followed in later years by the successive addition of three more paragraphs, each of which took away ground that appeared to be secured for coastal states by the preceding paragraphs. The last of these limiting paragraphs was, finally put by the Chairman in compromise language that, although somewhat ambiguous, was not seriously challenged within the Conference, and survived subsequent revisions of the negotiating text to become a part of the Convention adopted by UNCLOS on April 30, 1982.

Because Article 76 is complex, many are not sure just what it means. One of its provisions is to establish a Commission on the Limits of the Continental Shelf to "make recommendations to coastal States on matters related to the establishment of the outer limits of their continental shelf," and it is "on the basis of these recommendations" that the coastal state is to establish the outer limits of its continental shelf. Annex II, describing the functions of the Commission, provides that in "the case of disagreement by the coastal State with the recommendations of the Commission, the coastal State shall ... make a revised or new submission to the Commission." It is intended, then, that the Commission have some authority, and until it has functioned for a time, no one can be certain how the provisions of Article 76 will be interpreted and applied. But I will give my interpretation of them here and discuss what the effect of an alternative interpretation might be.

Although Article 76 is entitled "Definition of the Continental Shelf," it uses that term as a special juridical term applying to whatever part of the sea-bottom falls under national jurisdiction in the regime it describes. Geologists both inside and outside the Conference have done their best to have the term used only in the geomorphic sense (see Figure 1), but to no avail, mainly because the term was used in the same

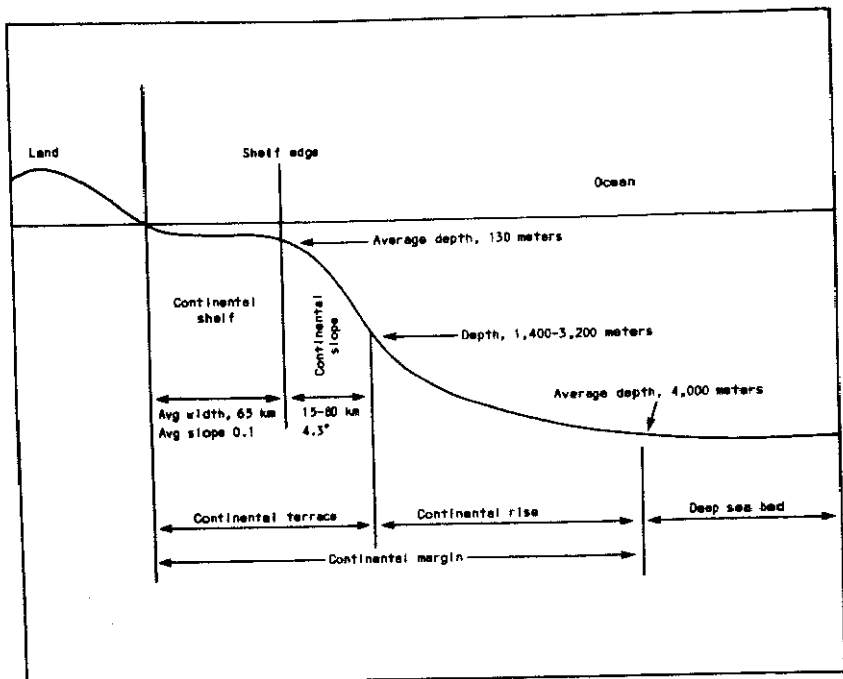


Figure 1. Diagrammatic profile of continental margin showing average widths, depths, and terminology of its geomorphic components. Modified from L. R. Hesselton, Jr., 1969, The continental shelf: Naval Studies Inst., Center for Naval Analyses Research Contr. 106.

Juridical sense in the 1958 Geneva Convention on the Continental Shelf, the thrust of which, the lawyers and diplomats believe, would be weakened if the term were used in its more restricted geomorphic sense. Be that as it may, the meaning of the term "continental shelf" is clarified within the text of Article 76. Paragraph 1 of Article 76 states that "the continental shelf of a coastal State comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin," and paragraph 3 says that "the continental margin ... consists of the shelf, the slope, and the rise," using these terms in their conventional geomorphic senses. Paragraph 3 goes on to say that the continental margin "does not include the deep-ocean floor with its oceanic ridges or the subsoil thereof," but such features are clearly meant in paragraph 1 to be a part of a coastal state's continental shelf "where the outer edge of the continental margin does not extend" ... "to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured." Sovereign rights over sea-bottom resources would also be given to the coastal state under the 200-mile exclusive economic zone described in Articles 56 and 57 of the Convention. Even though its inclusion in paragraph 1 may thus seem redundant, it serves to emphasize further that the term continental shelf as used in the Draft Convention is a juridical and not a geomorphic term. It is interesting to note that jurisdiction over the deep-ocean floor and its ridges within the 200-mile zone may have great significance for some coastal states. For example, Mexico and Ecuador would have sovereign rights over sulfide deposits recently discovered on the East Pacific Rise, the United States over those of part of the Juan de Fuca Ridge, and Saudi Arabia and Sudan over those of the Red Sea Deep. Isla Clarion (Mexico), Jarvis Island (United States), and perhaps other Pacific Islands may have recoverable manganese nodules within their 200-mile zones.

Paragraphs 1 and 3, then, would give the coastal state jurisdiction over the sea-bottom resources of the continental margin, or to a distance of 200 miles where the margin does not extend that far from the territorial sea baselines, but paragraphs 4, 5, and 6 successively cut back the part of the continental margin that may be included. Paragraph 4 states that where the margin extends beyond 200 nautical miles from the territorial sea baseline, its outer edge would be delineated by a line that is either "where the thickness of sedimentary rocks is at least 1 percent of the shortest distance ... to the foot of the continental slope" or "not more than 60 nautical miles from the foot of the continental slope." Although the "marginers" supported this formulation when it was introduced to the Conference in 1976 by the Irish delegation, they labeled it as a compromise that would much reduce the extent of the jurisdiction they believed they held under the 1958 Convention on the Continental Shelf.

The extent of coastal state jurisdiction gained under paragraph 4 would be further limited by paragraph 5, which states that "the outer limits of the continental shelf ... either shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured or shall not exceed 100 nautical miles from the 2,500 meter isobath." Paragraph 6 goes further to say "Notwithstanding the provisions of paragraph 5 on submarine ridges, the outer limits of the continental shelf shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured. This paragraph does not apply to submarine elevations that are natural components of the continental margin, such as its plateaux, rises, caps, banks, and spurs." The exemption of these important components, some of which, such as the Madagascar Plateau, extend for hundreds of miles from the coast, makes it highly probable that all of the hydrocarbon resources of the margins will be under coastal state jurisdiction -- an outcome that seems to have been favored all along by most of the Conference participants.

It is this paragraph 6, however, that is the most confusing. Before attempting to interpret it, however, two observations seem appropriate. One is to repeat that it is compromise language introduced by the Chairman of Committee II after years of negotiation on one of the Conference's most difficult issues. One of the common characteristics -- indeed, some might say merits -- of compromise language is a certain amount of ambiguity, enough so that both sides feel they can accept the language, even though each would have preferred other wording. In deciding whether or not the ambiguity is acceptable, the important considerations are whether or not the ambiguity is clarified in other parts of the article and, if it is not, how serious would be the effect of alternative interpretations. With respect to the first consideration, it seems clear from paragraphs 1 and 3 and the second sentence of paragraph 6 that it is the intent of the draft that coastal state jurisdiction over shelf resources beyond 200 nautical miles extend over some part of the continental margins, but not extend over the deep-ocean floor or its component elevations.

This leads to the second observation. The continental margins and deep-ocean floors differ greatly in their geologic origin and composition, but these differences are only indirectly, if at all, reflected in the names that have been applied to their component geomorphic features. This is partly because many submarine features were named long before their geologic character was understood. Even more important, however, is the fact that one of the principles guiding the naming of undersea features is that the name describes only the topographic configuration of the feature and not its geologic origin or composition. Names such as ridges, rises, and seamounts have thus been given to some undersea features that are part of the deep-ocean floor and to others that are a part of the continental margin. For example, the term "rise" is generally applied to the part of the continental margin that

risers gently from the deep-ocean floor to the base of the continental slope. It is also applied to elevations that may be a part of either the margin or the deep-ocean floor. Thus, the Lord Howe Rise is a part of the continental mass for which New Zealand is also a part, but the East Pacific Rise is a part of the mid-ocean ridge system. Because the geologic structure and composition of the Earth's crust are often reflected in its topography, it is true that many names have genetic implications. For example, most elongate, steep-sided elevations on the ocean floor are of igneous origin, are formed of oceanic crust, and most are called ridges. Many flat-topped, steep-sided elevations, on the other hand, are submerged parts of the continents and are often called plateaus. But some flat-topped elevations, particularly those that are also elongate, are called ridges, and some, such as the submerged extension of Madagascar, are called ridges on some charts and plateaus on others. So in attempting to determine whether continental shelf jurisdiction over a submarine elevation is to be limited by the first sentence of paragraph 6, one has to look beneath its geographic name to see whether in fact it is a component of the continental margin or the deep-ocean floor. In some areas the knowledge available now may not be sufficient to tell whether or not they are underlain by continental or oceanic crust -- that determination presumably will be made later on the basis of new field evidence that will be reviewed by the Commission on the Limits of the Continental Shelf. The point is, however, that regardless of what a feature had been called -- be it a ridge, plateau, rise, or whatever -- if it can be shown to be a natural component of the continental margin, the second sentence of paragraph 6 clearly provides that the 350-mile limit not apply.

To what kind of an elevation, then, would the 350-mile limit apply? Could it be argued that the submarine ridges of the first sentence of paragraph 6 refer to ridges that are components of the ocean floor, but that might be considered to be prolongations of an island (as the Mid-Atlantic Ridge could be of Iceland) or of a land mass (as Walvis Ridge might be of Namibia), and where national jurisdiction under paragraphs 4(a)(1) and 5 might be considered to extend outward from the base of the ridge or from the 2500 meter isobath for long distances? In my view, such an interpretation would be incorrect in the light of the last sentence of paragraph 3 to the effect that the continental margin "does not include the deep ocean floor with its oceanic ridges," and in the light of subparagraph 4(a) which says that "the coastal State shall establish the outer edge of the continental margin wherever the continental margin extends beyond 200 miles from the ... territorial sea baselines". Having just defined the margin in paragraph 3 in the conventional geomorphic terms as consisting of the shelf, slope, and rise, and specifically excluding as a part of it the deep-ocean floor with its oceanic ridges, no geologist or marine hydrographer would be likely to agree that the margin beyond 200 miles could consist of an oceanic ridge merely because it is a natural prolongation of an island or land

mass. The ambiguity in paragraph 6 is thus in my view satisfactorily clarified in paragraphs 3 and 4.

The representative of Iceland, supported by the representative of the Soviet Union, stated on the Conference floor in March 1980, however, the view that Icelandic jurisdiction over the Mid-Atlantic Ridge would extend to the 350-mile limit imposed by paragraph 6. I cannot imagine that the experts in the fields of geology, geophysics, or hydrography, such as Article 2 of Annex II specifies make up the membership of the Commission on Limits, would accept that view, but if they did, paragraph 6 would limit a claim on an oceanic ridge to 350 miles, rather than allowing it to extend, say, 100 miles seaward of the 2,500 meter isobath, which might be hundreds of miles farther out. Excluding such an option, far fetched as it seems to me, may be the justification for paragraph 6, and probably was to the Soviet Union, which had pressed earlier for the 350 mile limit.

In summary, Article 76 would give coastal States sovereign rights over sea-bottom resources within 200 nautical miles of the territorial sea baseline, regardless of the substrata, and it would give them sovereign rights over the continental margin where it extends beyond that distance to where the thickness of sediments becomes less than 1 percent of the shortest distance to the foot of the continental slope or to a line up to 60 nautical miles from the foot of the slope, provided that such jurisdiction over the margin not extend more than 350 nautical miles from the territorial sea baseline or 100 nautical miles from the 2500 meter isobath (see Figure 2). Under paragraph 3, ridges that are a part of the deep-ocean floor would not be under coastal state jurisdiction beyond the 200 nautical mile zone, but if national jurisdiction over an ocean-floor ridge beyond that were claimed as a natural prolongation of a landmass or for whatever reason, its extent under paragraph 6 could not be more than 350 nautical miles from the territorial sea baseline.

Are there other uncertainties in Article 76 that might lead to problems in its application? I do not believe there are any in the language itself, but there are two difficulties that may be encountered in the application of paragraph 4, in which both methods for establishing the outer limits of the continental margin require precise point identification of the foot of the continental slope and which in the first of them requires identification of points at which the thickness of sedimentary rocks on the continental rise does not exceed 1 percent of the distance to the foot of the continental slope. Although the foot of the continental slope -- defined in paragraph 4(b) "as the point of maximum change in the gradient [of the slope] at its base" -- is readily identifiable in many places, as pointed out by Professor Hollis Hedberg (who was the first to propose distance from the foot of the slope as a means of establishing the boundary), in many other places it is not readily identifiable. Professor Hedberg has also called attention to the difficulty of applying the sediment-thickness test.

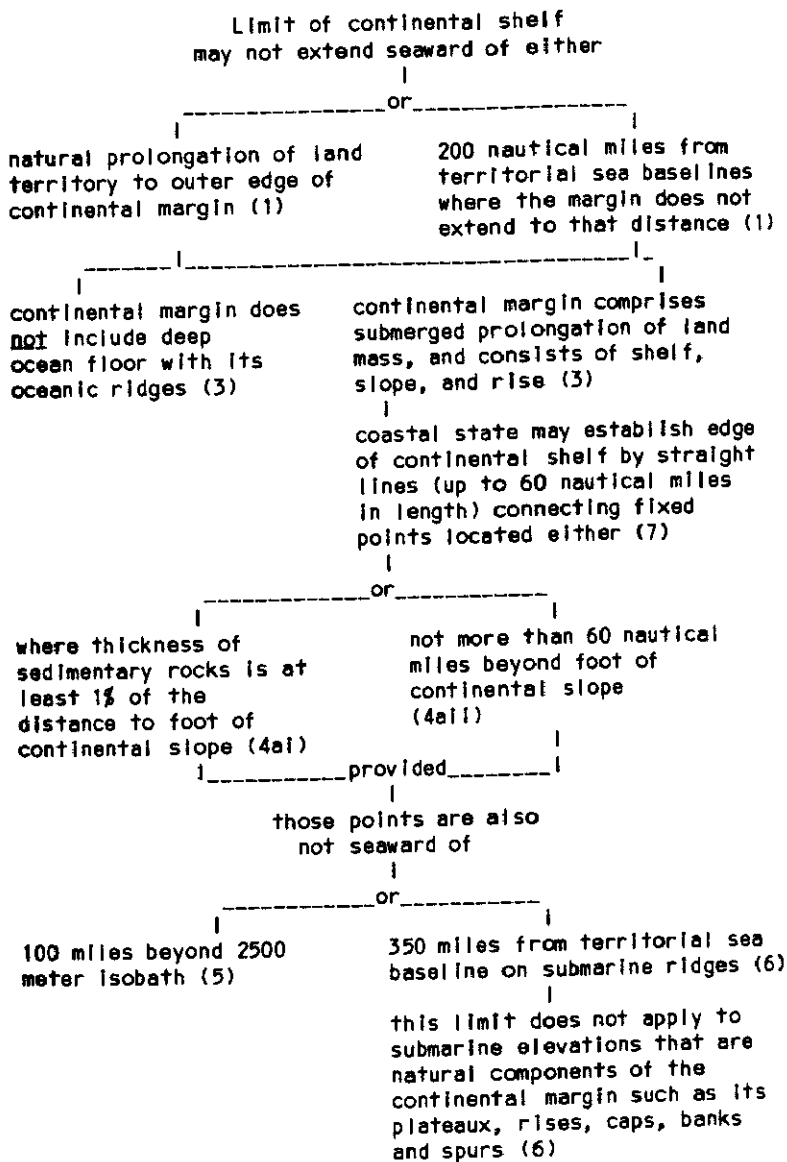


Figure 2. Diagram of Article 76 of the UNCLOS Convention on the definition of the continental shelf. The paragraph containing each provision is shown in parentheses. Modified from Bernard Oxman, "The Third United Nations Conference on the Law of the Sea: The Ninth Session (1980)," 75 *Amer. J. Intl. Law* 211, 229 (1981).

Sediment thickness can be accurately determined by drilling, the technology for which is now well in hand even at great water depths, but which is costly, particularly if it were to be used as the only basis of establishing the boundary. Seismic profiling is a much cheaper and more expeditious means of determining sediment thickness, but it requires assumptions about the velocity of sound waves in various kinds of rocks and hence introduces some uncertainty about the exact depth of the acoustic boundaries it reveals. This uncertainty does not bother geoscientists in their ordinary work, but conceivably it may be a source of disagreement in something as important as establishing the limits of a coastal state's sovereign rights over sea-bottom resources. Both the foot-of-slope and the sediment-thickness problems are ones that will face the Commission on Limits, which presumably will develop criteria and guidelines to help resolve them, but which in the end may have to make many judgmental decisions.

One provision of Article 76 that simplifies the task of defining the outer limits of the continental shelf is that of paragraph 7, which says that "the coastal state shall delineate the outer limits of its continental shelf, where that shelf extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by straight lines not exceeding 60 nautical miles in length, connecting fixed points, defined by coordinates of latitude and longitude." The use of straight line boundaries may help some coastal states "jump" natural indentations which might limit the extent of their jurisdiction if they had to follow them exactly. More importantly, however, if acoustic methods are used for determining the configuration of the bottom surface and thickness of sediment, it would be necessary only to make such profiles at widely spaced intervals, thus much reducing the time and cost involved.

In conclusion, the language of Article 76 and the means it describes for establishing the outer limits of coastal state jurisdiction over the margin have their shortcomings, but they meet two supremely important criteria: (1) the provisions are workable, albeit with some possibility of differences in interpretation that may call for a judgment by the Commission on Limits, and (2) they are the only terms drawn during the 75 weeks of negotiation over a period of eight years that were acceptable to the Conference participants.

THE UNCLLOS III DEFINITION OF THE CONTINENTAL SHELF:
APPLICATION TO THE CANADIAN OFFSHORE

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THE ISSUE

The seaward extent of the jurisdiction of coastal states over offshore mineral resources is one of the most fundamental law of the sea issues. International negotiations on the offshore limits of national jurisdiction have gone on under U.N. auspices for many years, so long in fact as to involve generations of diplomats, technocrats and other interested parties. The latest series of negotiations, which culminated two months ago in the adoption of the Convention on the Law of the Sea in New York on April 30, can be said to have begun back in 1968. It was then that the U.N. Ad Hoc Seabed Committee was set up in response to a Resolution introduced at the United Nations the year before by Ambassador Pardo of Malta.

Ambassador Pardo had two basic concerns in mind in bringing forward his Resolution:

- (1) That increasing interest in exploiting offshore mineral resources would give rise to rivalry between competing states, perhaps leading to open conflict;
- (2) That all states, including those without the necessary capability to become actively involved, should in some fashion benefit from the exploitation of these resources.

It was from this beginning that the concept of the "common heritage of mankind" evolved in respect of mineral resources beyond the limits of national jurisdiction. These limits were envisaged by Ambassador Pardo and others of like mind as being drawn as closely as possible to coastlines, and thus as advantageously as possible with respect to an international area beyond. The seaward limits of national jurisdiction being also the landward limits of such an international area, it was natural that this matter became from the outset a fundamental issue in the multinational negotiations on the law of the sea that ensued.

Much of relevance to this issue has transpired over the succeeding years. To attempt to touch upon these events and proceedings in even a cursory fashion would require quite an extensive undertaking in itself. Suffice it to say that, as the end result, there is now Article 76 on the "Definition of the Continental Shelf" in the Convention on the Law of the Sea adopted on April 30. It is my intention in this presentation to examine the substance of Article 76 and the effects of its application to the Canadian situation. The approach taken will naturally reflect the orientation of a Canadian resource manager, with 14 years of personal involvement in the negotiations that led to the recent adoption of the Convention in New York.

It might be mentioned in passing that the Canadian delegation played a large part over those years: in drawing together a small but very effective group of representatives of wide-shelf states that soon became informally dubbed the "marginers"; in founding the concepts for the approach upon which the provisions for Article 76 became ultimately based; in formulating this approach in appropriate texts for presentation to the U.N. Conference on the Law of the Sea in 1976; and in the process through which the Conference came to accept these and incorporate them into the current draft of the Convention in 1979.

THE SUBSTANCE OF ARTICLE 76

For years, what is now paragraph 1 of Article 76 on the legal definition of the continental shelf stood alone in successive drafts of the Convention as the sole provision in the Article. Alone the definition was very difficult for the Conference to accept. There were delegations that looked upon it as being virtually a license for the relatively few wide-shelf states to move their limits of national jurisdiction seaward at the expense of the common heritage of mankind and thus, at the expense of other states. In addition, a few delegations viewed it with suspicion as a means for indulgence in a form of "creeping" national jurisdiction that could be prejudicial to their own maritime aspirations of a global nature, which were not devoid of military connotations.

It was necessary, therefore, to expand on Article 76 with additional provisions that would convey its intent and application in such a fashion as to gain general acceptance in the Conference. It was not until 1979 that this was accomplished, as mentioned previously. In brief, the resultant provisions of Article 76 are designed to form a unity, a necessarily somewhat complex unity since the Article deals with variables of natural phenomena. It is meant to provide a coherent system of criteria and other elements involved in establishing the limits of the continental shelf, and thereby the seaward extent of a coastal State's exclusive rights to explore for and exploit offshore mineral resources; and it is designed to do this in a comprehensive fashion by including a legal definition and a physical description, methods for determination, delineation and verification, and procedures for registration and permanency.

The sketch included as Figure 1 is designed to illustrate basic concepts utilized in the substance of Article 76. It is a very diagrammatic cross-section and the vertical scale is greatly exaggerated. In brief, the continental margin can be described as the subsea prolongation of a land mass comprising the continental shelf, the continental slope, and, where developed, the continental rise. These physical components of the continental margin are not clearly defined with respect to water depth, varying in this regard from locality to locality. The shelf is that part of the margin that slopes gently seaward

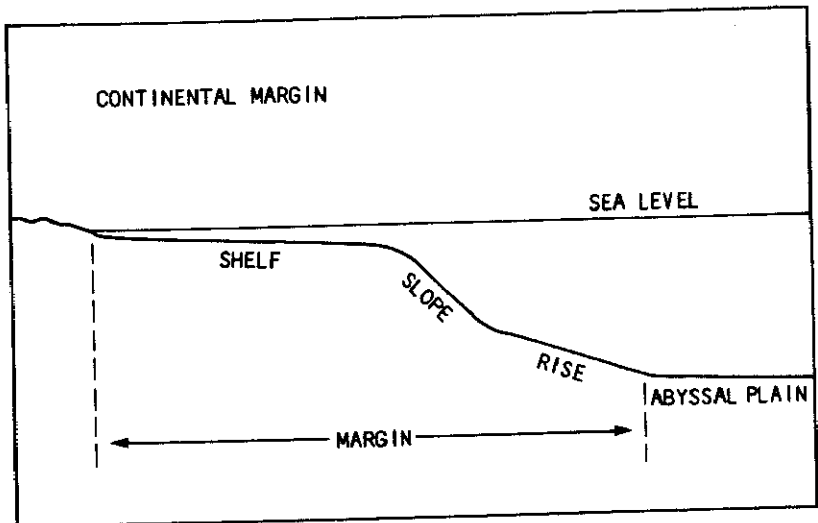


Figure 1. The continental margin.

from the coast, generally less than 1 degree, to a point where it merges into the slope through a substantial increase in gradient, off Canada's coasts generally about 3.5 degrees. The slope then continues downward into the ocean depths, merging into the rise where the latter is present, to the abyssal sea floor.

In examining the substance of Article 76, individual provisions will be briefly commented on as to intended function or purpose. This abbreviated treatment will be more from a technical rather than a legal viewpoint, the Article in overall approach being in the first instance a means of dealing with natural geological and physiographic phenomena:

1. "The continental shelf of a coastal State comprises the seabed and subsoll of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance."

This first paragraph is the legal definition of the continental shelf. The juridical continental shelf is defined as extending seaward to the limit of the continental margin or to a distance of 200 nautical miles, whichever is greater, and is thereby expressed in terms of the continental margin and the 200-mile limit.

2. "The continental shelf of a coastal State shall not extend beyond the limits provided for in paragraphs 4 to 6."

The reference here is to succeeding provisions of an explanatory/qualifying nature as regards the extent of the continental shelf.

3. "The continental margin comprises the submerged prolongation of the land mass of the coastal State, and consists of the seabed and subsoll of the shelf, the slope and the rise. It does not include the deep ocean floor with its oceanic ridges or the subsoll thereof."

This paragraph defines the continental margin as the subsea prolongation of a land mass and sets out its physical components: the physical continental shelf, the slope, and (where present) the rise.

4. (a) "For the purpose of this Convention, the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by either:"

The actual position of the seaward limit of the continental margin must be determined where it lies beyond 200 nautical miles and thus represents the limit of the juridical continental shelf (where the margin does not extend beyond 200 miles, the limit of the juridical continental shelf is simply the 200-mile limit). There are two alternative methods for doing this:

(i) "A line delineated in accordance with paragraph 7 by reference to the outermost fixed points at each of which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from such point to the foot of the continental slope; or,"

This is what might be termed the geological method. It utilizes the indicated presence of sedimentary rocks in significant quantities, expressed in terms of thicknesses not less than 1% of the distance from the foot of the slope. To apply this method requires considerable subsurface information, including that derived from systematic geophysical surveys, and thus involves the relatively large expenditures necessary to obtain such information.

(ii) "A line delineated in accordance with paragraph 7 by reference to fixed points not more than 60 nautical miles from the foot of the continental slope."

This is what might be termed the physiographic method. It utilizes only seabottom topography, and to apply it requires much less in the way of expenditures than the foregoing, geological method.

(b) "In the absence of evidence to the contrary, the foot of the continental slope shall be determined as the point of maximum change in the gradient at its base."

The foot of the slope must be defined. It is the point from which distances to the shelf-limit are measured in utilizing either of the foregoing alternative methods of delimitation, and must be identified as an actual or physical point in order to serve this purpose.

5. "The fixed points comprising the line of the outer limits of the continental shelf on the seabed, drawn in accordance with paragraph 4(a) (i) and (ii), either shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured or shall not exceed 100 nautical miles from the 2,500 metre isobath, which is a line connecting the depth of 2,500 metres."

These cut-off lines whereby the juridical continental shelf cannot extend seaward more than 350 nautical miles or 100 nautical miles beyond the 2,500-metre isobath, whichever is farther, are assurance against excessive or expansionistic offshore claims by wide-shelf states, thereby thwarting a form of what some have termed "creeping" jurisdiction.

6. "Notwithstanding the provisions of paragraph 5, on submarine ridges, the outer limits of the continental shelf shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured. This paragraph does not apply to submarine elevations that are natural components of the continental margin, such as its plateaux, rises, caps, banks and spurs."

This paragraph utilizes the 350-mile cut-off line to deal with another possible form of "creeping" jurisdiction, for example, in the case of an island state with extensive associated submarine ridges.

7. "The coastal State shall delineate the outer limits of its continental shelf, where that shelf extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by straight lines not exceeding 60 nautical miles in length, connecting fixed points defined by coordinates of latitude and longitude."

Having determined the seaward limit of the juridical continental shelf where it extends beyond the 200-mile limit, the mechanics of representing this shelf-limit involve drawing straight lines connecting fixed points on the limit not more than 60 nautical miles apart, which should serve to simplify its configuration considerably.

8. "Information on the limits of the continental shelf beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured shall be submitted by the coastal State to the Commission on the Limits of the Continental Shelf set up under Annex II on the basis of equitable geographical representation. The Commission shall make recommendations to coastal States on matters related to the establishment of the outer limits of their continental shelf. The limits of the shelf established by a coastal State on the basis of these recommendations shall be final and binding."

The Commission on the Limits of the Continental Shelf provides the means of verifying and legitimatizing the limit of the juridical continental shelf of a coastal state where it extends beyond 200 nautical miles. The coastal state must submit to the Commission the particulars of the limit that it has determined and delineated for its shelf beyond 200 miles, along with supporting technical and scientific data, within 10 years of the

entry into force of the Law of the Sea Convention for that state. The Commission may approve the submission as made by the state, or it may make recommendations on it in the context of Article 76, in which latter case the state must make a revised or new submission. The mandate of the Commission includes providing technical and scientific advice on the preparation of a submission, upon request by the coastal state, and it will be in a position to do this being composed of experts in the fields of geology, geophysics or hydrography.

9. "The coastal State shall deposit with the Secretary-General of the United Nations charts and relevant information, including geodetic data, permanently describing the outer limits of its continental shelf. The Secretary-General shall give due publicity thereto."

This, the final substantive paragraph, provides the mechanism for registering/ recording shelf-limits established in accordance with Article 76, and ensures that once established with descriptions deposited with the Secretary-General of the United Nations, such limits may not be moved seaward ("creeping" national jurisdiction) or moved landward ("creeping" international jurisdiction).

10. "The provisions of this article are without prejudice to the question of delimitation of the continental shelf between States with opposite or adjacent coasts."

The reference here is to Article 83 of the Convention on "delineation of the continental shelf between States with opposite or adjacent coasts".

APPLICATION OF ARTICLE 76 TO THE CANADIAN OFFSHORE

Canada has the longest coastline in the world and fronts on three oceans: the Atlantic, the Pacific and the Arctic. These three offshore regions differ considerably, and quite different results arise in each case from the application of Article 76.

The Pacific coast may be the best place to start, since the results of applying Article 76 there are quite straightforward. As illustrated in Figure 2, the submerged continental margin off Canada's west coast is relatively narrow, being similar in aspect to the margin offshore from the west coasts of North America and South America in general. There is no development of continental rise, the margin being essentially a terrace comprising the physical continental shelf and the slope. The break-over between the shelf and the slope occurs close to the west coasts of Vancouver and Queen Charlotte Islands, with the continental margin in its entirety comprising only some 50,000 square statute miles. In this region, therefore, it is the 200-mile limit that prevails as the seaward limit of the juridical continental shelf, giving rise to an area of Canadian mineral resource jurisdiction offshore from British Columbia of some 160,000 square statute miles, more than three times the area of the continental margin itself.

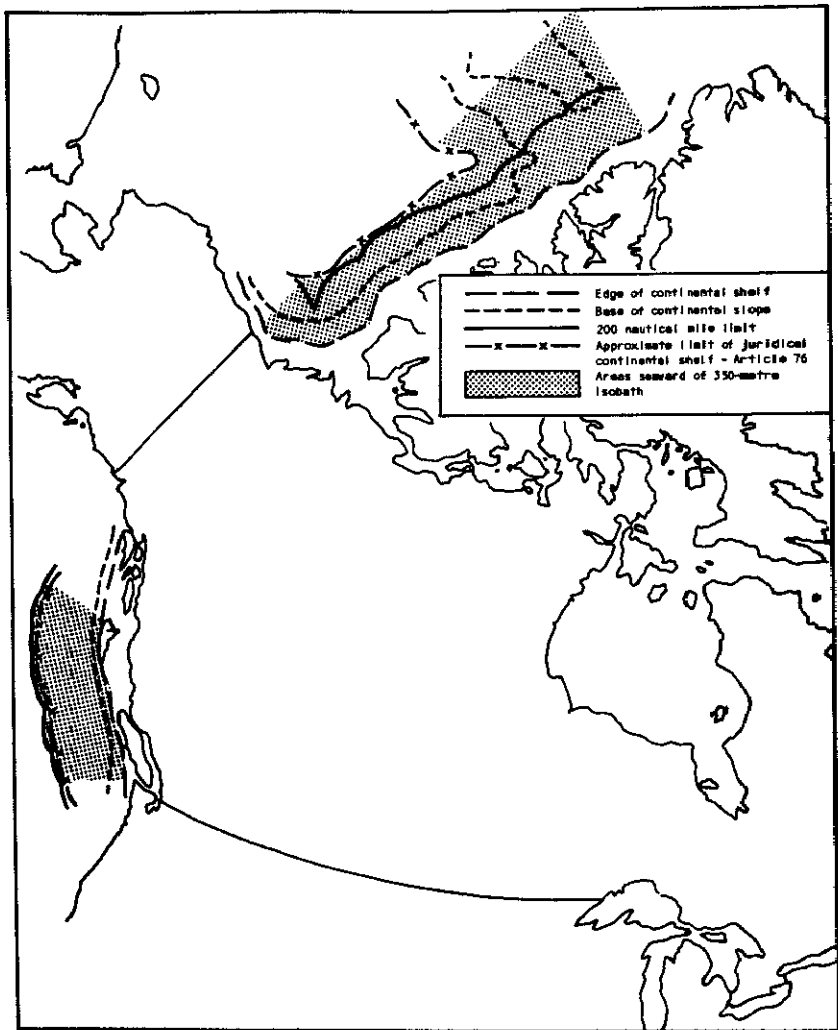


Figure 2. Pacific and Arctic coasts.

Figure 2 also includes the Arctic coast. The submerged continental margin in this region is wider than that off the Pacific coast, and a continental rise is developed. In the Beaufort Sea area, the seaward extent of the continental margin is about coincident with the 200-mile limit. From there northerly to about 80° N. latitude, the 200-mile limit continues to prevail over the limit of the juridical continental shelf, being somewhat beyond the seaward extent of the rise for the most part along this stretch. Farther north, the effects of seabottom topography take over due primarily to the presence of the submarine feature, the Alpha Ridge; and subparagraph 4(a)(ii) of Article 76, the physiographic method for delimiting the juridical continental shelf, comes into play. The approximate limit of the shelf indicated in Figure 2 for this area reflects the interpretation, based on current information, that the Alpha Ridge is continental in nature and should be treated as a natural prolongation of Canada's land mass.

The situation off the Atlantic coast is illustrated in Figure 3. It is in this region that the Canadian continental margin has its broadest extent, with the margin here including a well developed rise and extending seaward beyond the 200-mile limit throughout most of the stretch from offshore Labrador to offshore Nova Scotia, a distance of more than 2,000 miles. The physical continental shelf itself extends seaward beyond the 200-mile limit in the Grand Banks area. There is a great deal of sub-surface information for the region off the Atlantic coast, the bulk of which comes from exploration work carried out by oil companies over the past two decades in response to a resource-management regime that has emphasized work requirements rather than front-end or pre-production fiscal requirements. Moreover, there is considerable information with respect to sedimentary thicknesses derived from geophysical work carried out by scientists of the Atlantic Geoscience Centre of the Bedford Institute of Oceanography. Thus, it is generally possible in this region to apply sub-paragraph 4(a)(i) of Article 76, the geological method utilizing indicated thicknesses of sedimentary rocks, for delimiting the juridical continental shelf.

Starting at the southern end of the negotiated offshore boundary (essentially the median line) between Canada and Greenland, at 61 degrees N. latitude, the limit of the juridical continental shelf is about coincident with the 200-mile limit. Proceeding southeasterly, the shelf-limit diverges seaward from the 200-mile limit and continues to do so to a point some 500 statute miles east from Saint John's, in the Flemish Cap area. The shelf-limit is about coincident with the seaward extent of the rise along this stretch. En route to this point, the shelf-limit intersects one of the cut-off lines, the 350-mile line, provided for under paragraph 5 of Article 76, but continues on being still within, landward of, the other cut-off line provided for under paragraph 5, the line 100 miles beyond the 2,500-metre isobath. In the area of the Flemish Cap, the shelf-limit intersects this other cut-off line, and from there to a point

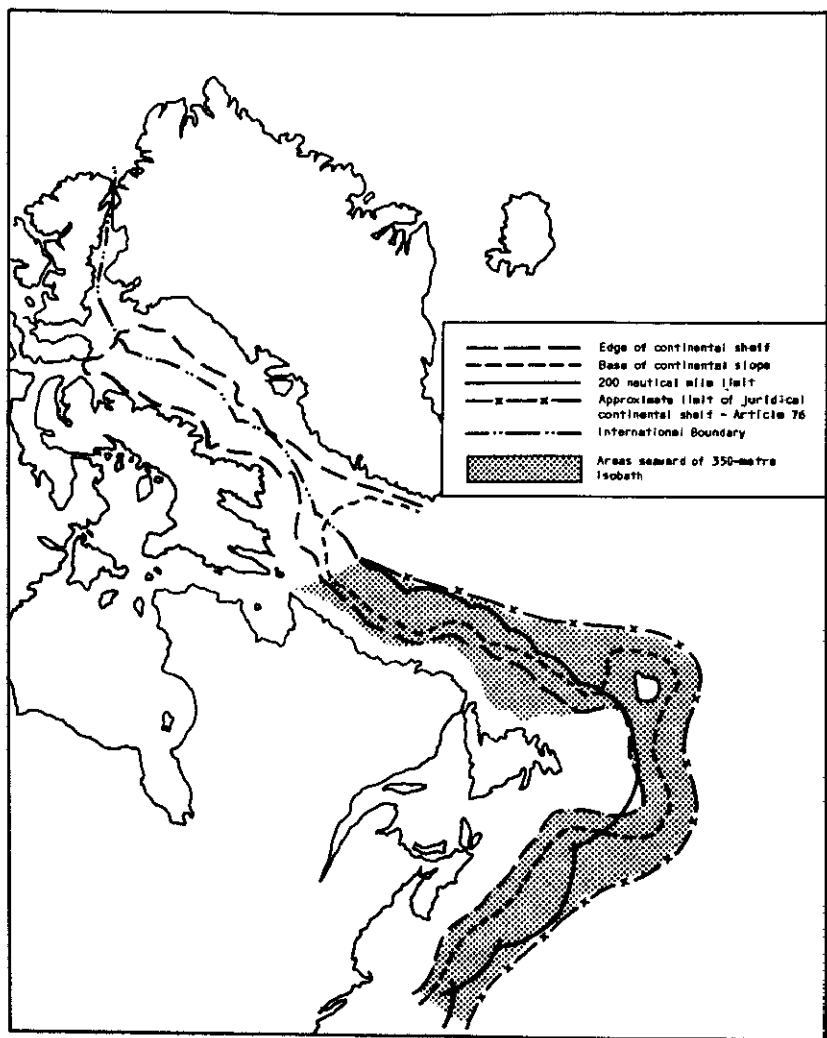


Figure 3. Atlantic coast.

south from the Avalon Peninsula, the limit of the juridical continental shelf is governed by one or the other of these two cut-off lines. Proceeding from there southwestwardly, the shelf-limit is about coincident with the seaward extent of the rise.

Canada's offshore within the shelf-limits thus defined under Article 76 is one of the largest in the world, probably second only to that of the U.S.S.R. It comprises a total area of some 2.5 million square statute miles, which is more than half as large as Canada's entire land area. Of this, about 1.1 million square miles lie off the Atlantic coast (including the Canadian portions of Davis Strait and Baffin Bay), about 160 thousand square miles lie off the Pacific coast, about 900 thousand square miles lie off the Arctic coast (including the offshore areas in the Arctic Archipelago region), and the remainder lies in the Hudson Bay region. As mentioned previously, the broadest development is off the Atlantic coast, and here some 280 thousand square miles lie beyond the 200-mile limit, mostly east and southeast from Newfoundland.

The foregoing is of great economic significance to Canada. Although not all of Canada's offshore is prospected, a number of large and deep sedimentary basins are known to occur, many of which include thick sections of Cenozoic and Mesozoic rocks of marine origin. Rocks of this age contain 80 to 90 percent of the world's known oil and gas reserves. Geophysical exploration has indicated the presence of numerous structures of the types associated with petroleum production elsewhere in the world, and some of those that have been drilled have been demonstrated to contain significant quantities of hydrocarbons.

The name "Hibernia," for example, is virtually a household word today. Hibernia, discovered off the east coast of Newfoundland in 1979, has been demonstrated by follow-up drilling to date to have recoverable reserves of oil in excess of 1 billion barrels. This puts it already in the category of a major commercial oil find, and there is a good likelihood that the reserves here will ultimately prove to be greater. "Venture" is a name that is not as well known, but it may become so in the not too distant future. Discovered off the south coast of Nova Scotia in 1979, Venture appears on the basis of follow-up drilling to date to have the potential of being the gas find in the Sable Island area that will justify a pipeline to the mainland, which could in turn facilitate the development of other discoveries that have been made in the same area. In the Arctic region, the name "Tarslut" may be the one best known at present, due to recent news reports on the follow-up well to this 1980 oil discovery in the Beaufort Sea.

Estimates of potential recoverable oil and gas have been made recently by the federal Department of Energy, Mines and Resources as follows: for the Atlantic coast (as defined previously), about 14 billion barrels of oil and 79 trillion cubic feet of gas; for the Pacific coast, about 250 million barrels of oil and 9 trillion cubic feet of gas; for the Arctic coast, including both offshore areas and contiguous onshore areas, about 14 billion barrels of oil and 199 trillion cubic

feet of gas, mostly in the offshore areas. The order of magnitude of these estimates can perhaps be better appreciated by noting that the estimate for oil off the Atlantic coast is about twice the current figure for remaining proven recoverable reserves of oil in Western Canada. A quite different situation could be visualized for the Pacific coast due to the fairly extensive area of deep seabed that falls within the limit of the juridical continental shelf in that region. However, nothing is known at present about the possibility of there being either polymetallic sulphide deposits or polymetallic manganese nodules in that portion of the Pacific Ocean.

COMPARISON WITH THE 1958 CONVENTION ON THE CONTINENTAL SHELF

Another manner in which to examine the effects of the application of Article 76 is by comparison with relevant provisions in the Geneva Convention on the Continental Shelf of 1958. According to that Convention, a coastal state's exclusive rights to explore for and exploit (produce) the "natural resources" of the continental shelf extend 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 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." This does not provide a very precise definition for the seaward extent of a coastal state's jurisdiction over offshore mineral resources, depending as it does upon the current maximum water depth in which mineral resource exploitation is taking place.

In 1958, the year in which our predecessors signed the Geneva Convention on the Continental Shelf, the maximum water depth in which mineral-resource exploitation was taking place off any sea-coast was about 75 metres, in respect of some oil wells producing just offshore from California. It can be appreciated, then, that the depth of 200 metres cited in Article 1 of the 1958 Continental Shelf Convention was at that time considered a seaward limit to be attained only in the far distant future. Progressing to the year 1968, the year that the latest series of negotiations began with the inception of the U.N. Ad Hoc Seabed Committee, the maximum water depth in which mineral resource exploitation was taking place at that time was still only about 100 metres, in respect of hydrocarbon production in the Gulf of Mexico. Today, in 1982, the maximum water depth in which exploitation is taking place is still only about 350 metres, in respect of hydrocarbon production, the deepest water sites being in the Gulf of Mexico and offshore from California.

Obviously, the seaward limit of national jurisdiction provided for under the 1958 Continental Shelf Convention, the positioning of which is dependent upon the efficacy of current mineral resource production technology, tends to move seaward with advancing technological capacity. This leaves much to be desired. A limit so determined can provide neither certainty

nor permanency for either the coastal state or the International Seabed Authority on the other side of the limit. The seaward limit of national jurisdiction provided for under Article 76 of the 1982 Law of the Sea Convention is a great improvement in this regard, and the two methods of delimitation for the continental shelf contained in paragraph 4 of Article 76 provide a degree of precision lacking in the 1958 Convention.

Moreover, Article 76 of the 1982 Convention recognizes the reality that the submerged continental margin is the natural prolongation of the land mass, the land territory, of a coastal state. The water-depth criterion of the 1958 Convention does not do this. As mentioned previously, the physical components of the continental margin are not clearly defined with respect to water depth, varying from locality to locality. If the current maximum water depth of mineral resource exploitation were to be applied to Canada's offshore areas, for example, the 350-metre isobath would in some places be down on the continental slope, in others it would cut across the physical continental shelf, and it would even be found within some of the channels of the Arctic archipelago.

The result would be that in the region off the Atlantic coast, much of the physical shelf northeast from Newfoundland and Labrador, most-to-all of the slope throughout the region and all of the rise in the region would be on the seaward side of the 350-metre isobath. The same would apply to most of the slope off the Pacific coast. Off the Arctic coast, much of the physical shelf, most of the slope in the Beaufort Sea area and all of it farther north, and all of the rise in the region would be on the seaward side of the 350-metre isobath. Even with a marked advancement in offshore production technology so as to double the current maximum water depth for mineral resource exploitation to around 700 metres, most of the continental slope throughout the regions offshore from Canada together, of course, with all of the areas beyond the slope would lie seaward of the limit of exploitability. The water-depth criterion of the 1958 Convention is not consistent with the realities of natural geological and physiographic phenomena.

CONCLUSION

It may now be necessary for some coastal states to adapt elements of their resource-management legislative-regulatory systems to the new definition of the continental shelf. In the case of Canada, this has now been done in respect of offshore oil and gas exploration and exploitation by means of national legislation passed by Parliament on December 18, 1981, and brought into force as of March 5, 1982. The Canada Oil and Gas Act defines "Canada lands" to include offshore areas in terms that are based upon the language and substance of paragraph 1 of Article 76, the legal definition of the continental shelf. At the same time, the Oil and Gas Production and Conservation Act 1970, which governs the operational aspects of oil and gas activities, was amended so that its area of application now similarly reflects the language and substance of paragraph 1 of Article 76.

In conclusion, Article 76 can be said to accomplish its purpose in a reasonably realistic and precise manner, probably more so than could have been hoped for back in 1968 at the beginning of the complex multi-national negotiations concerned with the extent of a coastal state's offshore jurisdiction. This is especially so taking into consideration that no provisions dealing with geological and physiographic phenomena of this nature could possibly be simple and without complications in their application. As regards the effects of applying Article 76 to Canada's offshore situation, to say that Canada comes out well under Article 76 is a fair statement, and no doubt there are those who would consider this somewhat of an understatement.

The opinions expressed are those of the author.

DISCUSSION AND QUESTIONS

ADAM KERR: I am a hydrographer, not a lawyer, and I am speaking personally, not for the Canadian government. I have watched the development of Article 76 with great interest as well as a good deal of concern -- a struggle for precision between geographer and hydrographer that goes back, I think, to the days of Whittemore Boggs. What concerns me is that the state of the art of measuring the physical parameters is really rather imprecise. A great deal depends on interpretation and interpolation. In the case of water depths we attempt to measure to one percent of the depth, which gives some idea of the degree of actual or potential error in such measurement. Over extensive areas of the Canadian Arctic, in particular, there is very little precision at present in the measurement of water depth.

Perhaps I could address a question to Professor Charney regarding geographically mobile (sand bar) islands such as Sable Island off the coast of Nova Scotia. I believe there is a provision on changes in deltas in the UNCLOS III Convention, but how will the new law of the sea deal with mobile island boundaries such as those of Sable Island?

JONATHAN CHARNEY: I am not familiar with Sable Island, but as I recall the Convention refers to water lines which are marked on large-scale charts officially recognized by the coastal state. Apparently the most recent such chart of the coastal area is taken to be conclusive evidence of the location of the water line. The boundary changes with the chart. But in the case of deltas, it is my recollection that the relevant article provides a more stringent, less changeable system of baseline delineation.

TULLIO TREVES: It seems that Article 76, like most of the Convention, does not escape the problem of determining whether or not it contains a norm of customary international law. On the face of things, there are at least four reasons for saying Article 76 does not correspond to unwritten (customary) law. First, it is too complicated to be, or become, customary law. Second, it involves an organization (the Commission on the Limits of the Continental Shelf), which is difficult to envisage as existing on a customary basis. Third, it involves revenue-sharing responsibility, which cannot be supposed to have a customary foundation. Fourth, to the extent Article 76 constitutes a limitation on the scope of the common heritage, there is a problem in presenting it on a customary basis.

But if it is not based on customary law, how are we to interpret its juridical significance for non-parties to the Convention? Are there no sovereign rights beyond the 200 mile limits? Or are there no legal limitations on the coastal states' "sovereign rights" entitlement to its offshore resources? I suppose one can argue both ways, as matters now stand in the law of the sea. Perhaps one has to choose one of

three possible solutions: a 200 mile limit; some kind of functional (*de facto*) limit; or a consolidation of the criteria set out in paragraph 5 of Article 76.

GORDON BECKER: My question deals with paragraph 5 of Article 76. Should we assume that the alternative cut-off lines (350 miles from the territorial sea baseline and 100 miles from the 2,500 metre isobath) are to be interpreted as subject to the phrase "whichever is farther seaward"?

DONALD CROSBY: It is my understanding that this was the intent. The coastal state is entitled to choose one or the other method of determining the cut-off line. This seems to be the only way a coastal resource manager could be expected to interpret the language, although it may not be entirely unambiguous.

VINCENT MCKELVEY: I agree with that interpretation. The same interpretation applies, I would say, to the choice between the alternative "geological" and "physiographic" criteria in paragraph 4.

LEWIS ALEXANDER: In concluding this morning's session, I wish to thank all speakers for the high quality of their presentations.

PART X

OCEAN RESOURCES AND INTERNATIONAL DEVELOPMENT

INTRODUCTORY REMARKS

Panel Chairman Arthur J. Hanson
Dalhousie Ocean Studies Programme
Dalhousie University

The final topic on the program is "Ocean Resources and International Development." We have decided to split the session into two separate panels: the first, dealing with the transfer of technology and other general questions associated with international development; the second, looking at some specific initiatives in marine resource development under the auspices of the United Nations and various international agencies active in that field.

Certainly questions of ocean resource management and international development follow closely all these problems in the law of the sea that have been discussed this week. Certainly those questions will be a major theme of debate around the world in the coming decades. There is obviously a growing interest in the development of ocean resources. It seems to me, however, that many of the activities between developed and developing countries in this field have gone on without much reference to the law of the sea. Fortunately, many of the agencies concerned with international development are now turning their attention to the oceans, and we are beginning to see the emergence of new frameworks which are designed to serve that purpose.

In my opinion, ocean resource development and management is a field in which many of the developing countries have much to teach the developed world from their experience with resource development. Some of the examples that come to mind are drawn from my own experience, mainly in Southeast Asia. In the case of aquaculture, for example, many of the Southeast Asian techniques are more advanced than anything we have in North America. Some of these countries have also gained fairly vast experience with offshore oil development. Possibly there is much for us to learn about dispute settlement and the procedural aspect of technology transfer. So we may be likely to find a kind of two-way transfer of ideas, and certainly a great deal of lateral transfer between developing countries.

Finally, there is a common problem that all development agencies have to contend with: the great difficulty of finding any specific government agency that deals directly with ocean resources as its major function. If we look at the development plans of most countries and at their research and development capabilities, we see serious deficiencies in the area of ocean development. Think, for example, of the formidable training requirements that must be met to create an adequate pool of manpower in this field. In the case of the smaller states, especially the small island states, the need to develop a critical mass of ocean skills and facilities is really crucial, even desperate, and there must be a higher level of sharing that we have seen so far in the world community.

With these introductory comments, I would now like to introduce this afternoon's speakers. The first speaker is Boleslaw Boczek, professor of political science at Kent State University. After obtaining a doctorate in law in Poland and a Ph.D. in political science at Harvard, Professor Boczek has written extensively in international law and the law of the sea. He will be followed by Jon Van Dyke, who is professor of law at the University of Hawaii and also a Fellow of the Environment and Policy Institute of the East-West Center in Honolulu. He has written on various topics in international law and on South Pacific problems, and his current research focuses on legal and environmental issues associated with nuclear waste disposal in the oceans. The commentator on the first two papers will be Elisabeth Mann Borgese, who needs very little introduction to most of you in this room. At present she is a member of the Dalhousie faculty in the Department of Political Science and chairman of the Planning Council of the International Ocean Institute. But she is perhaps even better known as author of several books on the ocean, stimulator of many ocean research and training initiatives, and as innovator in various areas of ocean management concerns.

The first of the speakers on the second panel will be Mati Pal, chief of the Mineral Resources Section of the Ocean Economics and Technology Branch of the United Nations Secretariat in New York. Born in Bangladesh, he was educated at Dacca University and at Yale University, specializing in resource economics and international economics. In recent years he has been involved in the substantive servicing of the Third U.N. Conference on the Law of the Sea and has had the opportunity of working with that conference's President, Ambassador Tommy Koh. The second presentation will be given by Georges Leger, Vice-President of Petro-Canada International Development Assistance Foundation in Ottawa. Born in Moncton, New Brunswick, here in the Maritimes, he took his bachelor's degree at Ottawa University and then proceeded to France and the U.K. for graduate degrees in law. Over the past ten years he served as a foreign service officer with the Department of External Affairs, and much of that time as a member of the Canadian delegation at UNCLOS III. In October 1981 he joined Petro-Canada to help set up its new subsidiary devoted to international development assistance. The third panelist will be James Mullin, currently Director of the Cooperative Programmes Division of the International Development Research Centre (IDRC), based in Ottawa. Prior to that appointment in 1981, he was Director General of Intergovernmental Relations in the Canadian federal Ministry of State for Science and Technology (MOSST), and while there he served as a spokesman for the industrial countries at the UN Conference on an International Code of Conduct for the Transfer of Technology. Originally trained as a physicist in Scotland, he began his career with the Atomic Energy Commission of Canada, and later worked with the Science Council of Canada on problems of science policy. The commentator on the second panel -- and the final

platform speaker -- will be Carlyle Mitchell, who is a close associate of ours at Dalhousie Ocean Studies Programme. Prior to his current activity as a research consultant, Dr. Mitchell was a senior economist with the federal Department of Fisheries and Oceans in Ottawa. Born on the Caribbean Island of Grenada, he has spent most of his professional life in Canada, but maintains a particularly close interest in Caribbean problems of ocean development and management.

TRANSFER OF TECHNOLOGY AND UNCLOS III
DRAFT CONVENTION

Boleslaw A. Boczek
Department of Political Science
Kent State University

INTRODUCTION

Perhaps the greatest challenge resulting from rapid developments in science and technology in the recent decades has been the need to develop appropriate international legal and organizational structures which would take into account the demands of the developing nations for a more equitable distribution of scientific and technological capacities, primarily through what has become known as "transfer of technology" and has emerged as a key issue in the developing countries' campaign for a New International Economic Order (NIEO). In these countries' perception their demands for the transfer of technology by the North (or rather the West) to the South are predicated on two assumptions: first, that technology plays a fundamental role in the socio-economic progress of all societies, the possession of appropriate technology being an indispensable condition for development [1], and, second, that technology is part of the "common heritage of mankind" derived by the West from the colonial exploitation and imperialist policies of the West [2].

The technology gap between the developing and developed nations is dramatically illustrated by the situation in the access to marine technology, and especially the deep seabed mining technology which is available only to a limited number of industrialized nations. It is the technological advances in this area that provided a major stimulus toward the convening of the Third United Nations Conference on the Law of the Sea, the forum in which the "Group of 77" has voiced demands concerning the transfer of marine technology as one means of speeding the development of the poor countries and thus contributing to the establishment of the NIEO [3].

The development of deep seabed mining technology is not the only advance recently achieved in the area of marine technology [4]. Technological progress in offshore oil and gas recovery has made it possible to exploit resources in more hostile environments and at greater depths. Significant progress has been made in fishing technology, both with respect to distant-water fishing and artisanal fisheries of developing countries by the introduction of outboard motors and the improvement of gear. The technology of mining polymetallic sulfides has also been advanced and progress has been made in the technologies of shipping and environmental protection. Naturally scientific knowledge of the oceans, now so closely linked to technological progress, has been expanding at a rapid rate. Advances have been made in harnessing the tidal power of the ocean and in the area of ocean thermal energy conversion (OTEC). There are

other, more exotic, marine technologies in sight, such as construction of undersea habitats, floating cities, and perhaps even the utilization of icebergs. Not all of the revolutionary advances in marine technology are, at least at this time, the right kind to be transferred to developing countries. This is the issue of the "appropriate technology" which is a problem of fundamental importance to be treated according to the particular circumstances of individual countries and types of technology.

Technology is produced and distributed within a definite political and legal system whose nature largely determines the less developed countries' access to technology [5]. Although the transfer of marine technology presents some unique features, primarily in the area of deep seabed mining, the basic framework which governs technology transfer in general applies to marine technology as well. This may be one reason why the international law aspect of marine technology transfer has been a rather neglected subject, whereas transfer of technology as such has been discussed in many reports and legal commentaries. It must also be noted that if transfer of marine technology is commented upon at all, it is only the controversial and much publicized transfer of the deep seabed nodule mining technology that is subject to legal analysis. It is remarkable that, except for two or three commentators [6], virtually all analyses overlook the fact that one whole part of the Draft Convention is devoted exclusively to the development and transfer of marine technology as such, and not just nodule mining technology only [7]. On the assumption that the transfer of the latter type of technology will be emphasized in the other paper on this panel, this presentation will focus on the provisions of the Draft Convention concerning technology transfer in general, but the few provisions in the Draft Convention on the transfer of fishery technology will also be considered. Since the proposed rules on the transfer of marine technology are only part of the controversial issue of technology transfer in general, the analysis of the Draft Convention will be preceded by a few summary remarks on the legal aspects of technology transfer to the developing nations with emphasis on these nations' criticism of the transfer process designed to restructure the legal regime of the transfer along the lines postulated by the ideology of the New International Economic Order.

THE CONCEPTS OF "TECHNOLOGY" AND "TRANSFER"

The concept of technology is rather vague and diffuse and, as noted in an UNCTAD report, "surrounded by mystery" [8]. Generally speaking, technology can be understood as "man's methods and tools for manipulating material things and physical forces" [9]. In this sense marine technology is, as defined in a report of the Secretary-General of the United Nations prepared for UNCLOS III, "a product of man's attempt to control or adapt to the ocean environment by means of rationally organized systems of operations" [10]. Technology includes at least the following ingredients: hardware, operating and maintenance

procedures and skills, and management capacity [11]. However, there is consensus that technology should be understood not only in its narrow meaning of capital goods (machinery and equipment), information (know-how and technical expertise, such as feasibility studies, plans, diagrams, instruction, designs, and the like), and skilled manpower (technical, advisory and managerial personnel, and training), the ingredients usually available only commercially and subject to proprietary rights, but that it should be conceived broadly as a certain cultural tradition, a pattern of thinking and doing things, developed in the human community throughout a cumulative process of learning and designed to deal with man's environment. This dimension of technology encompasses the whole national organizational, administrative, and educational infrastructure, government's science policy, planning and programming, and in general people's attitudes toward science and technology [12].

Among the main features of technology are its transnational origin and transmissibility across international borders. There is no definition of the term "transfer" in any of the international documents dealing with technology transfer. One could define international transfer of technology as a process of diffusion of technology through human activity across the borders resulting in an actual operation of some kind. Export of a finished product is not, as a rule, transfer of technology; it only transfers the result of technology. Generally speaking technology transfer is a two-stage process consisting of acquisition from the supplier of a technological ingredient and application thereof by the recipient. Participants in a transfer process may, and often do, include four parties: the source enterprise and the source country on the one hand and the recipient enterprise and the recipient country on the other. Among the channels through which technology is transferred are: (1) flow of books and similar published information; (2) movement of people, including study visits and the like; (3) knowledge of goods produced elsewhere; (4) training and employment of experts; (5) exchange of information and personnel; (6) import of machinery and equipment and related literature; (7) agreements on patents, licensing, and know-how, and -- one might add -- on technical assistance; and (8) direct foreign investment and operation of transnational enterprises [13]. The choice of the channel to acquire technology is usually dictated by the nature of the technology and the needs and technological capability of the recipient who may use several of the channels either singly or in combination. In the transfer of marine fisheries technology experience has proved -- and this certainly applies to other areas -- that the most effective transfer of technology occurs through "direct contact and actual working together of individuals" in the location where the new technology is to be applied [14].

It is very difficult, if not impossible, to obtain hard data concerning the transfer of marine technology to developing nations. As far as the channels of transfer are concerned, such technology is transferred through commercial channels, largely

through transnational corporations, and via bilateral and multilateral non-commercial programs and institutions. In general, the more traditional the knowledge is, the more likely it is to be available through non-proprietary channels, often -- as in the case of labor-intensive local fisheries -- through bi- and multilateral assistance programs.

Time limits do not allow to discussion of the variety of organizational forms used in technology transfer relationships between transnational enterprises and developing countries. Although historically direct foreign investment has been the predominant form, one recent significant trend has been resort to various kinds of joint venture such as those existing in fisheries between developed nations and partners from industrialized countries. Such joint ventures are a promising form of channeling marine technology also in other areas of ocean development. Technology is sometimes acquired through public sector enterprises, a method which, however, is not an automatic road to strengthening the technological capacity of the recipient country.

It is a well known fact that the methods and procedures used in the commercial transfer of technology by transnational corporations are a target of sharp criticism by the recipients of technology. The developing countries perceive the weakness of their position in the international technology market as stemming from the fundamental fact that whereas in the relations between the developed nations the technology flow, though unequal, is still two-way, the less developed countries are almost entirely recipients and only rarely suppliers of technology. This asymmetrical relationship places them in a weak bargaining position, and is otherwise compounded by their inferior economic position, weak planning, poor technical and managerial capabilities of their enterprises, and acute shortage of hard currency needed to acquire the desired technology ingredients [15]. Moreover, the flow of new technology occurs primarily among the developed nations and the trend appears to be away from, and not toward, the developing countries [16].

COMPLAINTS AND CRITICISMS

The developing countries' complaints pertain to a number of elements of the transfer process but especially to the elusive nature of the "package" transfers. Frequently there is a demand for "unpackaging" all the components of a transaction in order to permit a proper assessment of the quality of the technology components, and in general for a greater transparency of the operations of the transnational enterprises. The complaints of developing countries extend to various kinds of unfair restrictive clauses in licensing and other agreements, which have the cumulative effect of inhibiting the build-up by the recipient country of its indigenous scientific and technological infrastructure. One major target of the developing countries' campaign against the international legal system of technology transfer has been the regime governing patents and other

exclusive rights, which for the past hundred years or so has been based on a laissez-faire policy as reflected in the Paris Convention of 1883 [17].

One complaint voiced by the Third World countries is that in view of the deep technology gap between them and the industrialized nations the advantages of the Paris Convention accrue only to those countries -- or rather corporations engaged in large-scale research and development -- which are exporters of industrial property. Consequently, as viewed by spokesmen of the developing nations in a recent UNCTAD report, the national treatment clause which is the fundamental legal rule of the patent regime has become a "reverse system of preferences in the markets of developing countries for foreign patent holders" [18]. A foreign patent holding company is given an extremely strong commercial base, ratified by the law, in which to maximize its interests. As stated by a spokesman of the Group of 77 at UNCLOS III, "In many cases the technology was in private hands, protected by contract as well as by patent and copyright agreements, and was intended for uses that would produce the optimum commercial gain" [19]. Hence the developing countries demand, as part of the revision of the Paris Convention and in implementation of the basic U.N. General Assembly resolutions on the NIEO, preferential treatment for their nationals in some specific areas. Such demands are rejected by the United States which argues that if the UNCTAD Secretariat recommendation of discriminatory treatment against nationals of industrialized countries were adopted in an eventual revision of the Paris Convention, investors and patentees from such countries would have no incentive to transfer technology to less developed countries. Repercussions of the whole patent controversy upon the debate on the transfer of marine technology at UNCLOS III will be noted in pertinent paragraphs of this paper.

SPECIAL PROBLEMS IN THE TRANSFER OF MARINE TECHNOLOGY

All the complaints voiced by the developing countries against the objectionable practices of transnational corporations apply to technology transfer in general, but, as shown by the debate at UNCLOS III, such practices are perceived by the less developed countries to have an especially adverse effect upon the transfer of marine technology [20].

It was generally recognized at UNCLOS III, and very much emphasized by representatives of the developing world, that training and technical assistance play a crucial role in the effective transfer of marine technology [21]. One major postulate of the developing countries was that the transfer of these basically non-proprietary ingredients of technology be effected within the framework of bilateral technical assistance programs and preferably under the auspices of competent international organizations, even though such organizations are not necessarily in possession of the latest technological information in marine science and technology. As far as the

existing bilateral intergovernmental channels are concerned, the possibility of technical assistance and training in marine science and technology exists under agreements for scientific and technical cooperation, a fairly typical form of international agreement. In addition to governments, private institutions of developed countries have participated in cooperative ventures with developing countries designed to promote educational exchanges, training, and technical assistance related to marine capabilities in those countries. As far as the United States is concerned, Latin America has been a disproportionate beneficiary of this kind of program, as compared to other parts of the developing world [22].

The developing countries tend to prefer their development aid to reach them through the intermediary of international organizations rather than bilateral programs. However, transfer of marine technology through international organizations ranks rather low as a percentage of total concern of such organizations with technology transfer as such. Among the United Nations agencies and bodies IOC, IMCO (now IMO), FAO, UNEP, UNESCO Division of Marine Science (OCE), and Ocean Economics and Technology Office (OETO) of the UN Secretariat are engaged in some sort of marine technology transfer activity [23].

IOC's purpose is to promote scientific investigation of the oceans, the function which it carries out through three sections: Ocean Science, Ocean Services, and Training, Education, and Mutual Assistance in the Marine Sciences (TEMA). One of IMCO's functions is to provide technical assistance to developing countries. FAO has been carrying out the most extensive programs, primarily in the management of fisheries in the new situation of the extended fisheries jurisdiction. One function of its Department of Fisheries is to assist developing countries in utilizing their fishing resources to the best advantage and to provide assistance in the establishment, maintenance, and expansion of national and regional training institutions and in accelerating the transfer of technology through field operations. The nine multilateral regional fisheries commissions established under the auspices of FAO include largely developing countries. Although the functions of these bodies are in most cases limited to data collection and assessment they can play an important role in helping developing countries build up their national fisheries infrastructures. UNEP is, of course, known primarily for its Regional Seas Programme which has now moved to areas of great interest to the developing countries concerned. The small office of UNESCO Division of Marine Sciences has maintained scientific programs involving coastal areas, such as mangrove swamps, coral reefs, lagoons, and estuaries. OETO is concerned with providing marine technology information and technical expertise to developing countries.

In addition to the above-mentioned agencies, some other UN bodies are in one way or another engaged in activities related to the transfer of marine technology. ECOSOC itself has been

active in this field through its regional commissions, especially ESCAP. UNCTAD is concerned with shipping and ports and WMO, WHO, and IAEA are also engaged in some sort of marine technology transfer activities. It must be added that the non-UN agencies which deal with marine science and technology (the 21 fisheries commissions) are not designed primarily to provide assistance to the developing nations. Finally, two international non-governmental organizations, International Center for Living Aquatic Resources Management in Manila and South East Asian Fisheries Development Center are involved in providing scientific and technological assistance to Southeast Asian countries.

Both bilateral and multilateral, international organization sponsored programs of transferring non-proprietary marine technology are not considered adequate by the developing countries. Apart from the mistrust of the supplier countries' motives ("strings attached") in bilateral intergovernmental aid programs, major criticism of such programs is directed against their ad hoc nature and lack of coordination with related programs of technical assistance of the recipient country. Charges of "neocolonial" attitudes and indifference to the interests of less developed nations have also been raised. "Reverse" transfer of technology (the "brain drain") is a common complaint. The need to improve cross-cultural communication in technology sharing programs has also been raised [24]. Among the problems encountered in marine technology transfer through non-governmental cooperative training programs are: insufficient funding, lack of opportunity to participate in the planning of the program, short duration of programs, communication problems, bureaucratic obstacles, lack of adequate background training among participants from developing countries, and inability to absorb the technology within the developing recipient country's scientific and political system [25].

Although marine technology transfer through international agencies is politically more acceptable to developing countries than bilateral programs [26], it has been criticized by them as ranking very low among the technical assistance activities of international organizations. There are understandable limitations to such programs. They relate to the structural weaknesses of the United Nations and the performance of the international secretariat, for example. It is also recognized that international organizations do not, as a rule, have access to proprietary technology and the latest scientific and technological information [27]. Their training and technical assistance programs are usually on a small scale and largely sporadic. Inadequate funding is a perennial problem. They have been criticized for emphasizing short run gains, without any coherent long-term strategy and central coordination or a follow up of the structural impact of the programs upon the recipient countries. Duplication of effort and inter-agency rivalries still occur, and language and other communication barriers may be a serious obstacle. Finally, all these agencies are inter-

not supra-, national and ultimately depend on the goodwill and support of the individual sovereign states, which are not always ready to address themselves to marine development problems of other nations [28].

TECHNOLOGY TRANSFER AND UNCLOS III

The remarks so far allow the conclusion that the current state of the international legal and organizational framework for technology transfer does not, in the Third World's perception, meet the requirements of the NIEO. Hence the developing countries have undertaken, both at national and international levels, a concerted action designed to secure for themselves a more favorable international regime of technology transfer. It is against the background of national legislation to prevent the abusive practices of transnational corporations, of the attempts to revise the Paris Patents Convention and to adopt a legally binding code of conduct for the transfer of technology, and, last but not least, of the NIEO resolutions of the UN General Assembly (especially the Declaration and Programme of Action of 1974 and the Charter of 1975), that one must analyze the UNCLOS III Draft Convention's provisions on the transfer of technology. In this light these provisions can be seen as an attempt by the developing nations to institutionalize in a legally binding agreement a principle of the NIEO in one important sector of technology transfer. The remaining portion of this paper will analyze these provisions, dealing with such problems as: the legal nature of Part XIV, the beneficiaries of transfer, the protection of industrial property rights, the role of regional and national centers, the place of the International Seabed Authority in Part XIV, and the linkages between the technology transfer provisions and marine scientific research, and the UNCTAD negotiation on a code of conduct on the transfer of technology. Limitations of space and time make it impossible to trace the genealogy of Part XIV in the Seabed Committee and negotiations at UNCLOS III until the adoption in 1979 of the text of Part XIV which, except for some drafting changes, is the same as the final text voted upon in the spring of 1982.

Transfer of marine technology in general has not been in the forefront of the issues debated at UNCLOS III. In the words of Mr. Yankov, Chairman of the Third Committee, the debate on technology transfer was "less controversial than others", but still "very important" [29]. Certainly it was eclipsed by the more contentious issues of marine scientific research and the protection of marine environment, which were also allocated to the Third Committee. In addition, public attention focussed on the more concrete and publicized issue of deep seabed mining technology debated in the First Committee. It is remarkable that although innumerable articles and books have reviewed the work of UNCLOS III, the activities of the Third Committee concerning the transfer of technology have been, on the whole, completely ignored or treated marginally [30].

The idea of drafting legal rules to govern transfer of technology seemed novel and "somewhat outside the law of the sea

debate proper, having crept in just as a quid pro quo deal for the freedom of scientific research" [31]. It was also felt by some involved in the process of drafting the UNCLOS III Convention that technology transfer was being discussed in the law of the sea context for political purposes in order to establish a better bargaining position. There was also uncertainty about how to "draft something that will implement this transfer of technology idea" and what was actually expected from the Conference in this respect, except that it was believed that "there was going to be an obligation of some sort" to transfer marine technology to the developing nations [32]. From the very beginning of the Conference the prevailing opinion among the participants was that it would be impossible to lay down precise and detailed rules and that only a set of guidelines would be drawn up, leaving the task of working out the modalities of transfer to pertinent international agencies [33]. Indeed, the product of the Third Committee's deliberations turned out to be what had been anticipated at Caracas: a set of general principles and guidelines, largely restating in treaty form what was already being done within the framework of various international programs, especially in such form of non-commercial bi- and multi-lateral programs of technology transfer as technical assistance, training, and dissemination of information. Incidentally, the Draft Convention does not define marine technology but delimits its scope as including "the exploration, exploitation, conservation and management of marine resources, the protection and preservation of the marine environment, marine scientific research and other activities in the marine environment compatible with the Convention" [34]. There is no specific mention of shipping which the Indian delegation would have liked to include [35], but the specification of the Draft is broad enough to include all kinds of marine technology.

At the UNCTAD negotiations for a Code of Conduct on the Transfer of Technology the legal nature of that document was one of the hard core issues: should it consist of legally binding rules or only voluntary guidelines? In principle, such a problem should not have arisen at UNCLOS III, whose goal is to draft an international treaty: that is, legal rules. Still there was enough latitude in the possibility of using more or less stringent verbal phrases, from clearly mandatory verbs to watered down obligations or merely hortatory language in the articles dealing with technology transfer. Generally speaking, watering down is what happened to Part XIV. Whereas the embryonic draft of the Group of 77 [36] used such strong formulations as "shall actively promote", the ISNT, like the Draft Convention, has slightly weaker language, "shall cooperate to...actively promote" [37]. In general, throughout the negotiations the developing countries favored more direct formulations, whereas the developed nations would try to modify them by introducing indirect, milder formulas like "endeavor to" [38].

Another, more essential problem pertains to the way the Draft Convention formulates the nature of the norms to be adopted by the parties to the eventual Convention as a result of cooperation in promoting transfer of technology. The crucial rule here is Article 271 (Guidelines, criteria and standards), which originally, in its ISNT (1975) version, referred to states promoting "universally acceptable guidelines...for transfer of marine technology" [39]. Discussed against the background of UNCTAD IV deliberations on the legal nature of its Code, the final version, reading "generally accepted guidelines", emerged from a compromise between the Peruvian proposal of "generally applicable guidelines" [40] and the European Community's suggestion of "universally accepted and voluntarily applicable guidelines" [41], complemented by "criteria and standards" [42]. Under Article 271 the guidelines, criteria and standards would be established either on a bilateral basis or within the framework of international organizations and other fora. Here guidelines to be set by such bodies as UNCTAD and possibly WIPO seem to be implied. However, a proposal advanced by the EEC to name these two agencies as examples of the fora has not found way into the text [43].

In pursuance of the NIEO objective, the original agenda on the development and transfer of technology of the Caracas Session (1974) referred to the development of the technological capabilities of the developing countries only. Both the "proposal of 28" and that of the Group of 77 proclaimed the developing countries as beneficiaries of the transfer provisions, the latter proposal expressly mentioning also those which are "land-locked and geographically disadvantaged". Even the unofficial draft of the EEC submitted to the Chairman of the Third Committee followed basically the same point of view [44], as also did the ISNT [45]. However, this approach was questioned by some countries at the Third Session (1975), including Romania and Canada, which argued that it was essential that all states should benefit from the development of marine technology and that the draft articles should provide for a general rule of technology transfer to any state [46]. It was also pointed out that, on the one hand, some types of marine technology, such as deep seabed mining technology, were not available to most developed nations, while, on the other hand, some more advanced, semi-industrialized developing nations possessed technology which they could transfer to other states [47]. Thus originated the so called "Portuguese formula" of the Revised SNT which replaced the words "developing states including land-locked and geographically disadvantaged states" by "States which may need and request technical assistance in this field (that is, the development of the marine scientific and technological capacity), particularly developing states, including land-locked and geographically disadvantaged States" [48]. Hence, at least in principle, no special preferential regime for the developing countries was established in Part XIV; states as such are obliged to "cooperate within their capabilities to promote actively the development and transfer of

marine science and marine technology on fair and reasonable terms and conditions". Moreover, the endeavor to foster favorable economic and legal conditions for the transfer of marine technology should be made "for the benefit of all parties concerned and on equitable basis" [49]. On the other hand, Part XIV stipulates special treatment for the developing countries in specific areas, such as training and education, technical cooperation, and the like [50].

Commenting on the Draft of 77 submitted at the Third Session in Geneva (1975), which provided inter alia, that the International Authority shall ensure that all blueprints and patents used in the International Area for the exploitation of its resources and related activities be made available to all developing countries, the United States representative argued that "in the United States such technology was private property and therefore not subject to Government transfer" and that "his delegation would find it impossible to agree to any such provision" [51]. The positions of the United States and the Group of 77 reflected the patent controversy between the industrialized and developing countries and, more generally, the conflict surrounding the weak bargaining position of the latter in negotiating technology transfer transactions with transnational enterprises. The less developed countries realized, however, that proposals concerning commercial transfer would have to take account of the role of the private sector. As stated by the representative of Sri Lanka, since technology was in private hands, "[t]he political system would usually make direct government intervention to compel transfer of technology impracticable or very difficult. The Conference should try to achieve a balance between the understandable financial and other considerations that motivated those who currently possessed the technology and the wider social considerations that called for its rapid transfer to the developing countries" [52].

Unlike the negotiations on the transfer of the deep seabed mining technology in the First Committee, the question of industrial property rights was not a subject of heated debates in the Third Committee. Leaving aside the role of the International Seabed Authority in the transfer of patented technology to developing countries, the ISNT assigned to regional marine scientific centers the function of "serving as a repository of patented and non-patented technologies and know how" [53]. To meet the concern of the developed nations the phrase was changed in the ICNT to read: "compilation and systematization of information on marketing of technology and on contracts and other arrangements concerning patents", a formula taken over by the Draft Convention [54].

Although Part XIV does not expressly guarantee industrial property rights, such a guarantee can be implied from Article 267 ("Protection of Legitimate Interests"), dating back to the ISNT and derived from a proposal of Denmark on behalf of the European Community. Under this provision, in promoting cooperation concerning the development and transfer of marine science and technology, states shall have "due regard for all

legitimate interests including, inter alia, the rights and duties of holders, suppliers and recipients of marine technology" [55]. It is remarkable that except for the adjective "due" instead of "proper", this clause, suggested by the EEC, is a copy of a phrase in the Charter of the Economic Rights and Duties [56]. Despite this most respectable origin, a number of developing countries (Nigeria, Algeria, Egypt, for example) unsuccessfully tried to delete the relevant article or, like Peru, at least replace it by a less comprehensive formula [57]. An additional guarantee for commercial technology suppliers appears in the initial article of Part XIV on the cooperation in promoting the development and transfer of marine technology, which, as proposed by Denmark, should take place "on fair and reasonable terms and conditions" [58], a compromise formula which met the minimum concerns of both the developed and developing countries. This formula is virtually the same as the one found in the principles and the guarantees of the Draft Code on the Transfer of Technology [59].

The most controversial question in the debates on the transfer of technology was the place and role of the International Seabed Authority in a part of the Draft Convention designed to deal with the transfer of marine technology in general. The tactical goal of the developed countries was either to concede the Authority as little power as possible or, preferably, eliminate any mention of this body. In their view it was a threat to their interests and they preferred to tackle it exclusively in the context of the deep seabed issues in the First Committee [60]. The origin of the brief article where the name of the Authority is first mentioned dates back to Article 4 of the Nigerian proposal at Caracas, taken over without any essential changes by the Drafts of 28 and the Group of 77. It appeared in the ISNT and RSNT as well. Following their tactic the developed countries moved that the mention of the Authority be replaced by reference to "competent international organizations", playing down this motion as a small amendment of a drafting nature [61]. As usual, a compromise was reached and both the "Authority" and "competent international organizations" are now in the text. The deep seabed mining orientation of the article was stressed by naming the Enterprise as another recipient of technology with regard to the "activities in the Area".

The origin of Article 274 shows equal if not sharper controversy. The draft of 28 endowed the Authority with functions going beyond its activities in the area, such as a provision on marine scientific research and on setting up a special fund to finance all marine activities of the developing countries. The former was strongly opposed by the industrialized countries, including the Soviet bloc [62]. Moreover, in view of the UNCTAD negotiations the Western nations found it unacceptable and a dangerous precedent that the Authority should have the power to ensure that all blueprints and patents be made available to developing countries [63]. This united opposition of the industrialized world was taken

into account in the ISNT, where "blueprints and patents" were replaced by "technical documentation" to "be made available to all States, in particular developing States which may need and request technical assistance in this field", and the scope of the Authority's competence was limited to the International Area. The Revised Single Negotiating Text (RSNT) deleted any mention of a "special fund", but introduced "financial arrangements provided for in [the] Convention" [64]. Finally, from the Western point of view the key change produced in the draft of the eventual Article 274 (Article 86 of the RSNT) was adding the guarantee clause of Article 267: that is, a reference to "all legitimate interests including, *inter alia*, the rights and duties of holders, suppliers and recipients of marine technology". This means that in pursuing its objectives under Article 274, that is, ensuring training, technical assistance, technical documentation, and financial arrangements for developing countries, the Authority as well as states must respect all legitimate interests. Attempts by developing states to delete this clause at the 5th Session (1976) failed against counterarguments invoked by developed nations that retaining a reference to the rights and duties of holders and suppliers of technology lay also in the interest of recipients. "If the reference was deleted", argued the Australian representative, "the International Authority might not fully recognize those rights, and that would inevitably impede the transfer of technology. The acquired rights of holders and suppliers of technology must therefore be recognized and protected if the transfer of technology was really to be encouraged" [65].

Section 3 of Part XIV devotes three articles to the establishment of national and regional marine scientific and technological centers [66]. Promoting the establishment of regional centers, in particular in developing countries, in coordination with international organizations and national scientific and technological institutions, shall be the task of the parties to the Convention. Among the functions of such centers would be training and educational programs, management studies, organization of conferences, acquisition and processing of data and their dissemination, publicizing national policies and systematic comparative study of those policies, compilation and systematization of information on the marketing of technology and on contracts and other arrangements concerning patents, and technical cooperation with other states in the region [67].

The idea of regional centers in marine science and technology is only one example of the recent trend among developing countries toward regional and subregional cooperation, itself part of the concept and movement of the so called Technical Cooperation among Developing Countries (TCDC) [68]. It was recommended by the NIED Program of Action of 1974 and many international conferences and organizations and bodies such as UNCTAD, UNIDO, UNITAR, UNDP, and the 1979 Vienna Conference on Science and Technology for Development. A number of regional, mostly UN-sponsored centers have been set up in

Asia, Africa, Latin America, and the Middle East. Among marine related regional centers are the Maritime Transport Institute at Alexandria, a Regional Maritime Training Academy at Accra, a Regional Academy of Science and Technology of the Sea at Abidjan, a Fishery Development Centre in Ghana, and a Caribbean Fishery Training and Development Centre in Trinidad [69]. In view of this prevailing trend toward decentralizing the activities of global international organizations in the name of regionalism proclaimed as an integral part of a NIEO, it was natural for UNCLOS III to join this movement in the sector of marine technology "In order to stimulate and advance the conduct of marine scientific research by developing States and foster the transfer of marine technology" [70].

As noted by the Secretary-General of the United Nations in his Marine Technology Transfer Report of 1975, regional cooperation will not be a panacea. It has its limitations resulting from conflicts related to allocation of costs and benefits. Disputes over the location of such centers' headquarters can also be expected. To this one might add problems of coordinating the activities of such centers and setting up effective linkages leading up to global organizations and down to national centers, which are also envisaged by the Draft Convention in Article 275 proposed by Pakistan. National centers, including those in marine science and technology, are located in various parts of the developing world, for example, in Indonesia, Thailand, India, and in Latin America.

Marine scientific research and the transfer of marine technology were negotiated in the same Committee (III) and in the same working group within the Committee. These organizational links could not but have an impact upon the content of the negotiations on the transfer of technology. It was natural to treat these two subjects in the same group as the development of technology is now increasingly dependent upon advances in scientific knowledge, a fact of which the Conference participants were well aware [71]. In the early stages of UNCLOS III there were even signs that the connection between science and technology was interpreted by some delegations so closely as to imply that the task of the Third Committee was to regulate "marine scientific research and technology" only and not marine technology as a whole [72]. As noted by a commentator and a member of a national delegation at UNCLOS III, such an approach looked like sidetracking the discussion of sensitive issues related to the transfer of industrial technology which were being dealt with in other United Nations fora such as UNCTAD and WIPO [73]. However, in view of the general NIEO strategy of the developing countries, such a narrow interpretation of technology had little chance of being adopted by the Conference.

There was another point of contact between marine scientific research and transfer of technology, namely, at one time such transfer was believed by some to be an attractive bargaining tool in the hands of industrialized nations as a *quid pro quo* in return for uncontrolled access to the exclusive economic zones of developing countries. As early as 1973 such a

deal was hinted at by the United States in the Seabed Committee [74]. However, at the Caracas Session the United States spoke against it [75], and it does not appear that the quid pro quo linkage had any impact upon the final text of Part XIV. The developing nations' position was to view technology as part of the common heritage of mankind in which they could share as a matter of right, without any deals [76].

THE UNCLOS III AND UNCTAD LINKAGE

References have been made in this discussion to the connection that existed between the UNCTAD negotiations on the Code of Conduct on the Transfer of Technology and the more or less concurrent drafting of the rules on the transfer of marine technology at UNCLOS III. What follows is a brief review of the tactical and terminological linkages between these two negotiating processes [77].

The fact of bringing the problem of transfer of technology on the agenda of the Conference by the developing nations which subsequently submitted draft proposals on this subject can be partially explained by tactical considerations by which the Group of 77 was prompted. Specifically, success at the sectoral and relatively marginal marine technology transfer negotiations could serve as an argument to obtain concessions at the vital debates on technology transfer at UNCTAD. For their part, the industrialized Western nations (Group B at UNCTAD) were very reluctant to commit themselves with any proposal at UNCLOS III that might prejudice their position at the UNCTAD negotiations and, in general, they played a rather passive role in the initial stages of the Conference. It was only when the ISNT was to be drafted that the EEC submitted an informal proposal which showed the Western nations' concern not to compromise their position at UNCTAD [78]. Their resistance to include in Part XIV any mention of patents and, in general, any language that might be interpreted as a threat to industrial property rights can also be partially explained by similar considerations. Conversely, the United States' position in the First Committee was to stress that developments in the deep seabed mining negotiations had limited or no precedential effect upon other negotiations.

As far as terminological links are concerned, the similarity and even identity between certain phrases used in various UNCLOS III proposals and the language of the UNCTAD drafts is striking [79]. For example, the phrase "fair and reasonable terms and conditions" in the UNCTAD draft of the Group of 77 is identical with the one now found in Part XIV of the Draft UNCLOS III Convention. In a draft submitted at UNCLOS III by Peru in the spring of 1976, references to restrictive commercial practices and exclusive jurisdiction of the law and courts of the recipient state read like parts of the Code of Conduct [80]. On their part, the Western industrialized countries at UNCLOS III drew upon the language of their own proposals at UNCTAD [81].

All these linkages show that although the transfer of marine technology may present some unique problems, especially in the deep seabed mining technology, it is ultimately only one sectoral aspect of a general clash on fundamental technology transfer issues between the positions of the developing and developed countries.

THE TRANSFER OF FISHERIES TECHNOLOGY: A SPECIAL CASE

Compared with the most elaborate and complex rules on the transfer of technology for purposes of the deep seabed mining, the provisions of the Draft Convention concerning the transfer of fisheries technology are very brief and out of proportion to the vital importance that the improvement of fisheries technology has for the developing coastal states, especially in view of the protein deficiency of their populations and the extended fisheries jurisdiction in the Exclusive Economic Zone [82].

In addition to the general undertaking to promote the marine scientific and technological capacity of the developing countries, which, of course, includes fisheries technology, the Draft Convention includes a special provision for the transfer of fisheries technology as a quid pro quo for giving access to the surplus of the allowable catch in an exclusive economic zone. In situations where the coastal state does not have capacity to harvest the entire allowable catch. One of the conditions that a coastal state may impose upon nationals of other states fishing in its zone may relate to the "[r]equirements for training personnel and transfer of fisheries technology, including enhancement of the coastal State's capability of undertaking fisheries research" [83]. This provision is of particular interest to developing coastal states, since almost one third of the distant-water fishing of industrialized nations is conducted off the coasts of developing countries, mostly off the coasts of West Africa [84].

It is in the area of fisheries technology that the developing nations are typically confronted with the problem of choosing what is known as "appropriate" technology, and has otherwise emerged as a key element in the NIEO debate on technology transfer and the process of development in general. Promotion of "appropriate" marine technology is also one of the basic objectives under Part XIV of the Draft Convention [85]. Briefly speaking, the concept of appropriate technology is based on the fact that technology transfer usually involves not just pure and automatic imitation but necessitates adaptation to the local natural, cultural, economic, social, and other conditions [86]. In its application to the transfer of marine technology to developing nations the idea of appropriate technology means that in certain circumstances advanced capital-intensive technology of the industrialized (or "post-industrial") world may not necessarily be the right type of tool to be acquired by a developed country [87]. Experience confirms this in the area of fisheries, where promotion of labor-intensive artisanal

fisheries, mainly through programs of training and technical assistance, seems to be the right type of technology for many developing nations [88]. On the other hand, the transfer of capital-intensive fisheries technology has often proved wasteful and socially damaging, causing dislocation of labor and unemployment [89]. Yet some developing countries have decided to embark on programs of building up capital-intensive fisheries technology. In some cases this is done to obtain foreign currency, like Sri Lanka focussing on a modern shrimp fishery or Uruguay on a hake, both for export. In other cases like Nigeria and Ghana, it is done to increase the domestic fishery supply of protein [90].

In sum, transfer of appropriate fisheries technology is an urgent matter, since many coastal developing countries have acquired new fishing resources in their exclusive economic or fishery zones, which they cannot exploit or even assess because of inadequate scientific and technological capabilities.

CONCLUSION

In summing up the discussion of the provisions on the transfer of marine technology in the Draft Convention, it must be stressed that they do not lay down any clear legal obligations, but only establish certain standards of conduct which to a certain extent reflect the already existing practice. The developing nations concentrated much of their effort in the First Committee, where they perceived a much more vital aspect of technology transfer. It is significant that the most controversial technology transfer problem debated in the Third Committee was related to the International Seabed Authority, an intrusion from the subject matter discussed in the First Committee of the Conference. Perhaps the underestimation of the potential importance of Part XIV was a tactical error on the part of the Group of 77. Fascinated by the prospect of mining the fabulous resources of the deep seabed, they focussed most of their attention and effort on gaining access to the seabed mining technology to the detriment of other types of marine technology, such as fisheries technology. The inclusion in Part XIV of provisions on the Authority is structurally alien to this part of the Draft Convention, but in a certain sense it represents a success for the Group of 77. Still a compromise could be reached with the developed nations, since the role of the Authority is kept limited to the Area and its technology. It is also important that Part XIV recognizes the legitimate rights of the parties to technology transfer transactions: holders, suppliers, and recipients alike.

In conclusion, the provisions on technology transfer in the UNCLOS III Draft Convention are not likely to have any immediate discernible legal effect upon the transfer of marine technology. Yet even though Part XIV is not formulated in terms of specific legal norms, it does represent a modest step forward in the development of the international law of cooperation, with particular emphasis on aiding the developing countries. This reflects a shift in perception which has occurred in recent

years and is possibly one step in the formation of a customary law of the transfer of marine technology, or transfer of technology in general, in which there will exist a right to have access to technology and a corresponding duty to transfer it under mutually agreed terms and conditions.

NOTES

1. Numerous statements to this effect appear in various International documents and were also made by representatives of the Group of 77 at UNCLOS III. See e.g. Argentina, 1 OFF. REC. 73 (1975); Columbia, 2 *id.* 346; Cuba, Iran *id.* 347; Guinea *id.* 351, etc.
2. See e.g. statement by the Cuban representative at UNCLOS III: "the wealth and the technological superiority of many developed countries derived in part from Imperialist, colonialist, and neo-colonialist exploitation of the developing countries", 2 OFF. REC. 347 (1975).
3. The representative of Congo at UNCLOS III put it like this: [S]cientific research and the transfer of technology could help to establish more equitable relations between developed and developing countries". 2 OFF. REC. 353 (1975). Cf. Sri Lanka: "As long as marine technology remained in the hands of a few developed countries, the peoples of Asia, Africa, and Latin America would be unable to harvest effectively the resources of the sea which they so desperately needed". *id.* 337. And the strongest statement by Argentina: "The development of science and technology, controlled by world centres of power as an instrument of hegemony, had widened the gap between poor and rich countries...The new law of the sea must contribute to changing the present system of distributing world wealth and must allow the developing countries, at least in part, to narrow the gap separating them from the developed countries". 1 *id.* 73. For a general discussion of the law of the sea against the background of the NIEO see, among other studies, Borgese, The New International Economic Order and the Law of the Sea, 14 SAN DIEGO L. REV. 584 (1977); Morris, The New International Economic Order in the New Law of the Sea, in THE NEW INTERNATIONAL ECONOMIC ORDER 175 (Sauvant & Hasenpflug eds. 1977); Mesloub, Droit de la mer et nouvel ordre économique international, 15 REV. ALGER. SCIE. JUR. POL. ECON. 293 (1978). Boczek, Ideology and the Law of the Sea: The Challenge of the New International Economic Order [forthcoming].
4. For an assessment of some advanced types of marine technology see TECHNOLOGY ASSESSMENT AND THE OCEANS (P. Willmot & A. Slingerland eds. 1975) [Proceedings of the International Conference on Technology Assessment, Monaco, Oct. 1975].

5. This theme is developed in P. NANYENYA-TAKIRAMBUDE, TECHNOLOGY TRANSFER AND INTERNATIONAL LAW (1980).
6. See Prill, Technologie transfer and Meeresnutzung, 38 ZEITSCHRIFT FUR AUSL. OFF. RECHT & VOLKERRECHT 801 (1978); Treves, Le transfert de technologie et la Conference sur le droit de la mer, 104 J. DU DROIT INT'L 43 (1977). See also Martray, La recherche scientifique et le transfert des technologies oceaniques dans le cadre du nouveau droit de la mer 3 ANN. DE DROIT MAR. ET AER. 17 (1976).
7. Draft Convention on the Law of the Sea, UN Doc. A/CONF. 62/L.78, August 28, 1981, [hereinafter cited as Draft Convention], Part XIV.
8. UNCTAD, Guidelines for the Study of the Transfer of Technology to Developing Nations, UN Doc. TD/B/A.C. 11/9 (1972).
9. Schilling, Technology and International Relations, in 15 INT'L ENC. SOC. SCIENCES 584, at 589 (1967).
10. United Nations, Report of the Secretary-General, Description of Some Types of Marine Technology and Possible Methods for Their Transfer, UN Doc. A/CONF. 62/C.3/L.33, 4 OFF REC. 201, AT 202 (1975). Cf. the definition in an earlier UN Report, Problems of Acquisition and Transfer of Marine Technology, July 27, 1974, UN Doc. A/CONF.62/C.3/L.3, at 6, defining marine technology as a body of knowledge and hardware needed for the uses of the ocean space and developing marine resources. Part XIV of the Draft Convention does not define marine technology. A definition of technology for purposes of the transfer of the deep seabed mining technology is in Annex III, Art. 5 (8).
11. UN Marine Technology Report of the Sec.-Gen., supra note 10, at 202.
12. See, e.g. NANYENYA-TAKIRAMBUDE, supra note 5, at 11; Gold, The International Transfer and Promotion of Technology, in THE INTERNATIONAL LAW AND POLICY OF HUMAN WELFARE 549, at 551-53 (1978); Franssen, Comment in LAW OF THE SEA: THE EMERGING REGIME OF THE OCEANS 90 (J.K. Gamble & G. Pontecorvo eds. 1973) [Proceedings of the 8th Annual Conference of the Law of the Sea Institute, 1973].
13. UNCTAK, Transfer of Technology, Including Know How and Patents: Elements of a Programme of Work for UNCTAD, UN Doc. TD/B/310, quoted in Patel, Technological Dependence of Developing Countries: A Survey of Issues and Lines of Action, in LAW OF THE SEA: THE EMERGING REGIME OF THE OCEANS, supra note 12, at 58-59.
14. Liston & Smith, Fishing and the Fishing Industry: An Account with Comments on Overseas Technology Transfer, 2 OCEAN DEV. INT'L L. 285, at 327 (1975).
15. Among many reports and studies see UNCTAD, Guidelines, supra note 8. See also Ewing, Transfer and Development of Technology: The Problem of Developing Countries in Perspective, 11 J.WORLD TR.L. 1 (1977).
16. Lowenfeld, 71, ASIL PROC. 81 (1977).

17. For the latest text of this Convention on the International Union for the Protection of Industrial Property (1883) see 21 UST 1583; 24 UST 2140; TIAS 6923, 7727. For the historical origin of the patent system and incisive criticism of its laissez faire philosophy see NANYENYA-TAKIRAMBUDE, supra note 5, Chs. 4 & 8. See also Jayogvind, The International Patent System and Developing Countries, 20 INDIAN J. INT'L. 47 (1980).
18. UNCTAD-ECOSOC-WIPO, The International Patent System: The Revision of the Paris Convention for the Protection of Industrial Property, UN Doc. TD/B/C.6/AC.3/2 (1977) AT 25-26.
19. Statement by representative of Sri Lanka, 2 OFF. REC. 337 (1975).
20. See, e.g., statement by representative of Venezuela, 2 OFF REC. 344 (1975).
21. See e.g., statements by representatives of Nigeria ("the most effective means of transfer was by training and education"), 2 OFF. REC. 348 (1975); rfi 58 Trinidad-Tobago ("there was an urgent need for the training of marine scientists from developing countries in all aspects of marine science and technology"), id. 71; Madagascar ("existing international agencies and the International Sea-Bed Authority should draw up programs for training personnel from developing countries in marine technology, using the knowledge and experience of advanced industrialized countries"), 2 id. 336.
22. Franssen, supra note 12, at 96. For a critical review of marine training assistance programs see Ross & Smith, Training and Technical Assistance in Marine Science -- A Viable Transfer Product, 2 OCEAN DEV. INT'L L. 219 (1974).
23. This discussion is based on L. ALEXANDER, REGIONAL COOPERATION IN MARINE SCIENCE (Report prepared for IOC, OETO, and FAO, Dec. 1978) and id., Organizational Responses to New Ocean Science and Technology Developments, 9 OCEAN DEV. INT'L L. 241 (1981). See also critical remarks in Miles, On the Roles of International Organizations in the New Ocean Regime, passim [Paper prepared for the 14th Annual Conference of the Law of the Sea Institute, Kiel, 1980].
24. This problem is analyzed in Dar & Levis, Effective Communication in Technology Sharing, 2 OCEAN DEV. INT'L L. 379 (1975).
25. All these problems are analyzed in Ross & Smith, supra note 22.
26. See, e.g., statements by representatives of: Colombia, 2 OFF. REC. 338 (1975); Venezuela, id. 344; Iraq, id. 350; Libya, id. 353; India, ibid.
27. A UN report found that "the weakness of present United Nations system activities relating to the expansion of marine transfer (sic) of technology is insufficient involvement by non-States." Manpower Requirements of the Authority and Related Training Needs: Preliminary Report

- of the Secretary-General, Aug. 17, 1979, UN Doc. A/CONF.62/82, 12 OFF.REC. 57, at 65 (1980). The developing countries believe that the present efforts of the UN system in the field of the transfer of marine technology are "far below current requirements and would be particularly inadequate to meet the demands generated through operation of the Convention on the Law of the Sea". Draft Resolution, Sept. 23, 1980, submitted by a group of developing countries at UNCLOS III, UN Doc. A/CONF.62/L.64 (1980).
28. See comments in Alexander, Organizational Responses to New Ocean Science and Technology Developments, *supra* note 23, at 264.
 29. 2 OFF. REC. 385, 355 (1975).
 30. For a few exceptions see note 6 *supra*.
 31. Report of Discussion Group leaders in LAW OF THE SEA: THE EMERGING REGIME OF THE OCEANS, *supra* note 12, at 132.
 32. Comments by Brittin and Lapointe, *id.* 110.
 33. Statements by representatives of: France, 2 OFF.REC. 339 (1975); Israel, *id.* 343; Venezuela, *ibid.*; Iran, *id.* 347.
 34. Draft Convention, Art. 266 (2).
 35. 2 OFF. REC. 378 (1975).
 36. UN Doc. A/CONF.62/C.3/L.12/Rev. 1, April 24, 1975, 4 OFF. REC. 198 (1975).
 37. Compare ISNT, Part III, Development and Transfer of Technology, Art. 1 (2) with Article 266 (1) of the Draft Convention.
 38. See the "endeavor" formula in Articles 266 (3), 269 (1), and 272. On behalf of the EEC France proposed to modify the English version "states...shall...promote" (Article 3 of ISNT, Part III) to "States shall endeavor...to promote", an amendment which would reconcile it with the French version "les Etats s'emploient a promouvoir". However, this French proposal did not find its way into the ICNT. Treves, *supra* note 6, at 48, n. 116.
 39. ISNT, Part III, Art. 6.
 40. Informal proposal of April 8, 1976. See THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA: DOCUMENTS OF THE NEW YORK SESSION, 10 MARCH, 7 MAY 1976 (R. Platzoder ed. 1976) at 218, cited in Prill, *supra* note 6, at 834, n. 124.
 41. Oral proposal of the Fed. Rep. of Germany at an informal meeting on April 20, 1976, Platzoder Documents, *supra* note 40, cited in Prill, *supra* note 6, at 834 n. 124. See also Treves, *supra* note 6, at 47, n. 13.
 42. As noted by Treves, *supra* note 6, at 48, the adverb "generally" emphasizes that the guidelines may be valid even if not accepted by all. The past participle "accepted" allays the concern of the developed countries that by the use of the word "applicable" they would have to follow rules which they considered unacceptable.
 43. Platzoder DOCUMENTS, *supra* note 40, at 218, cited in Prill, *supra* note 6, at 834, n. 124.

44. Letter of the EEC, May 26, 1975. Treves, supra note 6, at 49, n. 24.
45. ICNT, Part III, Art. 1 (2).
46. 4 OFF.REC. 103, 104 (1975).
47. See Treves, supra note 6, at 49. Countries such as Brazil, India, Mexico, let alone Singapore and South Korea, are investors abroad expanding the activities of their transnational companies and exporting marine technology. For example, Indian firms are setting desalination plants in the Middle and Far East and South Korean companies undertake consultancy abroad in shipbuilding. See on this Lail, Developing Countries and the Emerging International Technological Order, 33 J. INT'L AFF. 77 (No. 1, 1979).
48. Draft Convention, Art. 266 (2).
49. Id. Art. 266 (1) (3).
50. Id. Arts. 268 (d), 269 (a), 272, 274 (b)(c)(d), 275 (1), and 276.
51. 4 OFF.REC. 103 (1975).
52. 2 OFF.REC. 337 (1975).
53. ISNT, Part III, Art. 11 (g).
54. ICNT, Art. 277 (h); Draft Convention, Art. 277 (h).
55. ISNT, Part III, Art. 2; Draft Convention. Art. 267. See UN Doc. A/CONF.62/C.3/L.31 (Texts on Items 13 and 14) 4 OFF.REC. 270 (1975). See also Treves supra note 6, at 52-53. The same phrase appears in Article 274 (1) but not in Article 144.
56. Charter of Economic Rights and Duties of States, Dec. 12, 1974, Art. 13 (2). G.A. Res. 3281, XXIX, U.N. GAOR, Supp. (No. 31) 50. U.N. Doc. A/9631 (1975), reprinted in 14 INT'L LEGAL MAT. 251 (1975).
57. Treves, supra note 6, at 53, n. 38.
58. Draft Convention, Art. 266 (1).
59. UNCTAD Draft International Code of Conduct on the Transfer of Technology, May 6, 1980, UN Doc. TD/CODE TOT/25, Chs. 2.2.VI and 5.5.3(a)(1) (but with the phrase "mutually agreed"). The Code is reprinted in 19 INT'L LEGAL MAT. 773 (1980).
60. In the words of U.S. representative at the 3d Session (Geneva) "the connection made between the transfer of marine technology and the international Authority was a matter for the First Committee", 2 OFF. REC. 103 (1975).
61. See Platzoder DOCUMENTS, supra note 40, at 217, cited in Prill, supra note 6, at 834, n. 125.
62. See statements by representatives of the United States, Bulgaria, and the German Democratic Republic, 4 OFF. REC. 102, 103, 104 (1975). The Roumanian delegate did not echo the Soviet viewpoint. Id. 103.
63. See statement by U.S. representative to the effect that patented technology was private property "and therefore not subject to Government transfer" and that his delegation "would find it impossible to agree to any such provision". 4 OFF. REC. 103 (1975).
64. Rev. SNT, Art. 86.

65. 6 OFF. REC. 105 (1977). Cf. the Canadian statement, 4 OFF. REC. 104 (1975). For Iraq's attempts to eliminate the clause at the 5th Session see statement by that country's representative, 6 OFF. REC. 103 (1977).
66. Art. 275 (National Centers); Art. 276 (Regional Centers).
67. Draft Convention, Art. 277.
68. See Chilters, Technical Co-operation among Developing Countries: History and Prospects, 33 J. INT'L AFF. 19 (No. 1, 1979).
69. Alexander, Organizational Responses to New Ocean Science and Technology Developments, *supra* note 23, at 254.
70. Draft Convention, Art. 276 (1).
71. See, e.g., statements by representatives of Burma, Cameroon, and the representative of the Federal Republic of Germany who stated that "there was a close substantive link between marine scientific research and the transfer of marine technology". 2 OFF. REC. 338, 339, 345 (1975).
72. See the phrase used by U.S. representative at the 3d Session (1975), 4 OFF. REC. 103 (1975). Cf. Article 1 of the EEC proposal, cited in Treves, *supra* note 6, at 59, n. 57.
73. Treves, *supra* note 6, at 58-59.
74. Statement by U.S. representative in Subcom. III of the Seabed Committee, July 20, 1973, UN Doc. A/AC.138/SC.111, SR 42, at 16 (1973).
75. 2 OFF. REC. 342 (1975). However, hints that such a deal was possible were made by a representative of India. *Id.* 353, and vaguely the Federal Republic of Germany. *Id.* 345.
76. Opinions that the developing countries would not agree to any quid pro quo had been expressed before UNCLOS III dealt with the matter. See, e.g., Franssen, Understanding the Ocean Science Debate, 2 OCEAN DEV. INT'L L. 187 (1974). Cf. Waggener, The Transfer of Marine Science Technology: Quid pro Quo for Freedom of Scientific Research?, 12 SAN DIEGO L. REV 700, at 714-16 (1975).
77. This typology follows Treves, *supra* note 6, at 56-58.
78. Treves, La Comunità economica europea e la Conferenza sul diritto del mare, 56 RIV. DIR. INTERNAZIONALE 445, at 465 (1976).
79. Treves, *supra* note 6 wryly calls it "transfer of terminology". To all this one can add the terminology borrowed by UNCLOS III from the Charter of Economic Rights and Duties (*supra* note 56), Art. 13 (2) which also appears in the Preamble, para. 1 (II) of Group B Draft Outline of the Code of Conduct, UN Doc. TD/B/C.6/1, Annex II (1975).
80. Compare the Peruvian proposal of April 8, 1976 (*supra* note 57) with UN Doc. TD/B.C.6/14, Annex II (1975).
81. Compare Draft Convention, Art. 266 (3) with para. 3.3. of the UNCTAD Draft Code, submitted by Group B, UN Doc. TD/B.C.6/1, Annex II (1975). Article 266 (3) originated in the proposal of the Federal Republic of Germany. See further discussion in Treves, *supra* note 6, at 57.

82. See the discussion in Alexander, Organizational Responses to New Ocean Science and Technology Development, *supra* note 23, at 243-45.
83. Draft Convention, Art. 62 (4)(j).
84. See data in Gulland, The New Ocean Regime: Winners and Losers, CERES, July-Aug. 1979, at 20, 21. See also Christy, Transitions in the Management and Distribution of International Fisheries, 31 INT'L ORG. 234, at 241-44 (1977).
85. Draft Convention, Art. 268 (b).
86. See on this UN, Report of the United Nations Conference on Science and Technology for Development, Vienna, August 20-31, 1979, A/CONF. 81/11, at 21.
87. The need to transfer "appropriate" technology to developing countries was emphasized by numerous representatives of such countries at UNCLOS III. See, e.g., China, 2 OFF. REC. 344 (1975); Pakistan, *id.* 377.
88. See Weiss, Technology Transfer and the Oceans, in LAW OF THE SEA: THE EMERGING REGIME OF THE OCEANS, *supra* note 12, at 85; Liston & Smith, *supra* note 14, at 311.
89. Examples are: Ghana, where most of the modern trawlers acquired abroad were not used or were resold; Brazil, where development of a modern fishing fleet in the South led to unemployment in the traditional fishing villages in the North. Weiss, *supra* note 88, at 93-94. Kenya, concerned about possible unemployment, decided rather to increase the use of outboard motors on her traditional artisanal boats. See McCay, Appropriate Technology, Fisheries, and Resources Management 11 [Paper at the 20th Annual Convention of International Studies Association, 1979] (referring extensively to 39 MARINE FISHERIES REV. (1977)).
90. McCay, *supra* note 89, at 9.

TRANSFER OF SEABED MINING TECHNOLOGY: A STUMBLING
BLOCK TO U.S. RATIFICATION OF THE CONVENTION ON THE
LAW OF THE SEA?

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INTRODUCTION

The Convention on the Law of the Sea was adopted in April 1982 by a vote of 130 to 4, with 17 abstentions [1]. The United States voted against the text and seven Western European nations were among those that abstained. One of their concerns was that the language on the transfer of technology in the seabed mining provisions exacted too high a price from the Western consortia that have been preparing to enter this industry for the past decade.

This paper examines these technology transfer provisions in the context of the evolving economic conditions that exist in the world today. The economic gap that divides the nations of the world into the "developed" and the "developing" camps has been a concern to many. The developing nations have been demanding technology transfers with regard to investments in their own territories. They have also insisted on an equitable sharing of the resources beyond national jurisdiction and have focused on the potential wealth of the seabed as a first step in their efforts to close the gap between the rich and the poor. In 1970, all the nations of the world agreed that these resources should be the "common heritage" of humankind and that the developing nations should have special consideration when these resources were exploited. Since then, however, the "rich" nations have felt that they are not so rich and have focused on the seabed resources as a way of using their technological advantage to maintain their economic strength. The negotiations at the Third United Nations Conference on the Law of the Sea [2] did not, therefore, end with a happy consensus, because of the disagreement on the seabed minerals and the technology needed to extract them.

The focus on the transfer of technology by the developing nations -- which is a central component of the program known as the New International Economic Order (NIEO) [3] -- is logical. The developing nations perceive technology as being essential to their successful economic development, but are frustrated by the stranglehold which Western-based multinational enterprises have

over it. At the United Nations General Assembly, a declaration establishing permanent sovereignty over natural resources was adopted in 1962 and the Charter of Economic Rights and Duties of States was passed in 1974 [4]. Technology transfer was isolated as an object of attack and cited as one reason for existing international economic inequities [5].

TECHNOLOGY TRANSFER AND THE DEVELOPING WORLD

Technology Transfer Defined

A simplified definition of technology transfer reads, "the application of science to the solving of well-defined problems." [6] Technology stems from science, going a step beyond pure science. Third World views of technology transfer are, however, generally broader. The term has, for instance, been defined as "all elements of productive knowledge needed for the transformation of inputs into products, in the use of these, in the development and rendering of services, as well as in the generation of further productive knowledge." [7] These inputs include capital, human labor and information [8]. Whereas most technology transfers had been seen by developed nations as including designs, processes and some construction, most developing countries desire the term to include the transfer of a larger set of capabilities and activities. Items which the developing world has deemed necessary for development of industrial technology include:

- a) feasibility studies, market surveys, and other pre-investment services;
- b) determination of the acceptable range of technologies and eventual choice of technology;
- c) industrial processes, including machinery;
- d) engineering design and detached engineering;
- e) plant construction and installation of machinery;
- f) training of technical and managerial personnel;
- g) management and operation of production facilities;
- h) marketing information; and
- i) improvements in processes and designs [9].

Certainly such items are prerequisites to successful economic development for countries operating in the early stages of the industrial cycle.

Technology as Part of the Common Heritage

Developing countries carry this broad view of technology transfer into their negotiations with the developed nations. They argue that this development technology is part of the "universal human heritage to which all countries have access." [10] The current technology gap is sometimes blamed on past imperialism and present neocolonialist dependencies.

The developed countries argue that this view is without merit, because technological advances, which result only from substantial investment in research and development (R & D), are

a source of competitive strength which must be dealt with in the marketplace. This perspective is derived from a long-enduring laissez-faire tradition of liberal economic individualism.

These opposing approaches lie at the middle of the present stalemate in the North-South dialogue. Global negotiations continue on many fronts in hopes of achieving a compromise between the developing countries' desire for technology and the developed world's need for natural resources.

Although the basic principle of permanent sovereignty over natural resources has been accepted by the developing world and the developed nations, the concept of technology as being part of the "universal human heritage" has not gained equal acceptance. The primary forum for discussion and debate has been the United Nations Conference on Trade and Development (UNCTAD), which has been holding a series of negotiations toward the drafting of a Code of Conduct on the Transfer of Technology [11]. In this arena, the developing countries have opposed those restrictive business practices of multinational firms that they deem unfair and argued for favorable supplier guarantees in technology agreements [12].

Multinational Practices Challenged

The focus of the attack by developing nations has been the licensing practices of the multinationals. These range in form from simple marketing arrangements for introducing new products or management agreements to the establishment of wholly-owned subsidiaries. Bolstered by the international patent structure [13], which allows a multinational to control a foreign market without a capital investment, these practices perpetuate the development inequities and heighten developing country/multinational tensions. The holder of a patent has the exclusive right to produce the patented product directly or to license its manufacture to some third party [14]. Often, however, the owner of a patent will register it in a foreign nation, but will not "work" it there, thus precluding others from using the process. The patent, in this instance, would be for defensive reasons only. Such a system does not lead, and has not led, to promotion of indigenous technological development in the Third World. Instead, less than 5% of all research and development is carried out in the developing world, even though more than 70% of world population lives there [15].

Other practices the developing nations would like to eradicate include the packaging of technology transfers and the abuse by suppliers of their dominant position, particularly in pricing practices. Major goals that the developing countries deem necessary to change the current system are: (1) development of technological capabilities in recipient countries; (2) assurance of the effective performance of transfer agreements (and the technology); (3) national regulation and screening of agreements by recipient states; and (4) development of equitable dispute settlement mechanisms [16]. The developing nations feel these practices and goals must be addressed in order to increase their bargaining leverage in the

acquisition of technology from the multinationals of the developed world.

The Widening Gulf

Are the developing nations justified in asking for all of this? It is impossible to deny the existence of a wide gulf between the peoples of Asia, Africa, and Latin America on the one hand, and the peoples of the developed nations on the other. Per capita income levels, productivity statistics and health conditions provide ample evidence of this gap. It is clear that a myriad of factors account for this situation, but it is also clear that fundamental systemic reform is needed to close this gap. Without such action, the massive debt burdens that exist in developing countries today will expand and have dramatic negative impacts on world trade and development. Substantial increases in energy import bills alone could trigger such a calamity [17]. It is no answer to complain that developed nations also have problems.

Some argue that the developed world has a moral obligation to improve the lot of the less developed countries. Opponents of the NIEO claim that "[o]nly on the bankrupt theory of retributive justice as applied to the post-colonial era could one hope to defend the dichotomy of the Third World view..."[18] But it is also possible to argue in favor of such a commitment on grounds of simple self-interest and rationality. By assisting the developing world, the West can serve its own narrow political ends (e.g., discouraging outside tampering with desperately weakened nations in need of capital, food and arms) and increase economic stability of all nations to promote global trade. This economic stability would not only create more opportunities to develop markets for goods and services from developed nations, but also would reduce the threat of nuclear blackmail by frustrated leaders and lessen the probable negative impact of rampant worldwide population growth [19].

National Efforts to Require Technology Transfer -- Selected Cases

Developing nations have increasingly required technology transfer as a condition of foreign investment in order to reduce the technological gulf between themselves and developed nations. Access to technology is of critical importance in the quest for economic development and independence, because without it, developing nations are unable to tap their own resources. Screening allows developing nations to perform a selection function, identifying ways in which technological needs can be met by available technology, evaluating appropriate technologies, unpackaging technology bundles, negotiating the best terms and adapting the technologies once absorbed [20]. This process is facilitated by the establishment of a centralized agency or ministry, empowered by the legislature or executive to register or reject foreign technology transfer agreements. This section will begin with an overview of the first modern screening process to be established, that of Japan, and then proceed to a review of a few of the transfer programs

now in use, namely those of the Andean Pact nations, Mexico and Korea.

Japan

Technology transfers have been taking place for years, despite the fact that awareness of the problems and issues associated with them have only recently achieved recognition. During the postwar occupation of Japan by the U.S. Armed Forces, the Ministry of International Trade and Industry (or MITI) was created to assist in Japan's economic recovery. In the 30 years since the Occupation, MITI has evolved from merely regulating technology transfer to coordinating technological growth and development with national economic goals [21].

MITI works in conjunction with the Agency for Industrial Science and Technology (AIST) to administer legislation on foreign investments and to plan domestic industrial development. Working committees, consisting of engineers from MITI, AIST and specialists from consulting firms, universities and private industry gather and evaluate the needs of a particular sector and consider which available technology might fulfill these needs. Considerable attention is paid to the suitability of the package for disaggregation and local development [22].

Japan's institutional framework for screening has facilitated adoption and adaptation of foreign technology and promoted greater policy cohesion [23]. It was rapidly recognized by other developing countries as a model worthy of emulation, inspiring them to establish screening mechanisms of their own.

The Andean Pact Nations

Responding to the cues from MITI, Brazil promulgated a decree in 1962 [24] by which all technology agreements requiring payments to be sent abroad were to be registered with the Central Bank. In 1970, the creation of the Instituto Nacional de Propiedad Industrial (INPI) took screening beyond mere review of foreign exchange issues and into the realm of overall scientific and social policy; its purpose was specifically to approve or reject technology agreements [25].

The serious economic conditions in Latin America during the 1960's inevitably inspired a cooperative effort among various other Andean nations with respect to foreign investment [26]. In an effort to improve their weak bargaining positions, Bolivia, Chile, Colombia, Ecuador, Peru and later Venezuela decided to adopt a framework of investment rules as a regional body -- the Andean Common Market (ANCOM). Based on the Andean Subregional Integration Agreement or Cartagena Agreement, ANCOM was inspired by the Japanese and drew upon the antitrust and restrictive business practice legislation of the U.S. and the European Economic Commission in order to promote effective government involvement in the economic and social direction of member nations.

Decision 24 of this accord set the guidelines by which technology transfer contracts were to be judged by these

nations, approval being contingent on "effective contribution of the goods incorporating the technology." [27] The Code ensures flexibility in the decision-making process by virtue of its minimal standards which allow existing relationships to flourish and new ones to be developed [28].

The cumulative effect of these regulatory schemes and screening control mechanisms has been to give Andean nations greater command over their technological destiny, a substantially better sense of direction in technology policy planning and a start toward the development of indigenous technology through local research and development.

Mexico

Latin America's successful implementation of the Cartagena Agreement served as a stimulus for Mexico's Technology Transfer Law of 1972 [29]. According to the Director General of Mexico's National Registry on the Transfer of Technology:

[The major aim was] to strengthen the bargaining power of the national buyers and to make possible for local enterprises the access to the best available technology on the best conditions of opportunity, quality, and prices [30].

Under this law, registration is required "of those documents indicative of agreements having legal effects in the territory of the Mexican Republic, and whose object is the transfer of technology in any form." [31] Unless agreements are submitted to the Registry within 60 days after execution, they are considered without legal effect and are thus unenforceable in Mexican courts; they are also unable to qualify for incentives normally offered to foreign investors [32]. Bureaucratic delay is avoided in a provision whereby submitted agreements which have not been acted upon within 90 days are automatically deemed valid and registered [33].

Flexibility is the key to the 1972 law which allows authorities to ignore specific restrictive provisions normally prohibited in technological agreements as long as overriding national needs are fulfilled by the technology being received [34]. Article 7 enumerates the fourteen circumstances under which registration is to be denied [35], but implies both a technological and economic evaluation of agreements.

Various criteria other than those specifically mentioned in Article 7 are used by the Registry in its evaluation [36]. Negative determinations may be appealed in a two-stage appeals process.

To date, the Registry has been very effective in administering the law on transfer of technology. Ministry officials are able to negotiate on a more equal footing with foreign technology owners, and substantial technology advancement has flowed into Mexico [37].

Korea

Most notable of the Asian nations' technology transfer programs is that of Korea. Starting from a position similar to that of Japan and progressing by concentrating on many of the same industries as did Japan during its development phase, Korea has undergone a successful and rapid economic development.

Various government branches have been established in Korea to deal with industrial and technological policy. Each is dedicated, in different ways, to coordinating national efforts at control of foreign technology imports. Three statutes were enacted which contain distinct legislative outlines for interagency planning and review of potential technology agreements. The economic success of this nation speaks well for the efficacy of the system [38].

From the various examples discussed above, it is clear that technology transfer to developing countries is an inevitable and reasonable byproduct of investment. Both developing nations and multinational enterprises must learn to look at the screening process not as a negative, restrictive mechanism, but as a potential reward structure. This process is feasible by relating registration and approval of technology agreements to incentive schemes, thereby encouraging multinationals to comply with screening rules. All parties to these national technology agreements appear to have come to the realization that without greater cooperation, creativity and flexibility, neither the developing nor the developed world stands to make significant gains.

Technology Transfer and the UNCTAD Code of Conduct

In addition to these national efforts, regulation of technology transfer has been a major topic at the negotiating tables at international conferences dealing with North-South economic issues. Primary among these conferences has been the UNCTAD negotiation of a draft Code of Conduct on the Transfer of Technology.

Following on the heels of the Declaration on the Establishment of a New International Economic Order and the Charter of Economic Rights and Duties of States (both in 1974), the UNCTAD Code of Conduct has been at the heart of the developing countries' efforts to regulate multinational transfers of technology. Initially drawing largely from the Latin American models of domestic technology screening laws [39], the draft Code of Conduct reflects many developing country preferences. Restrictive practices of multinationals are curtailed [40], development of indigenous technological capability is promoted [41], and provision of truly "appropriate" technology is emphasized.

Despite several years of negotiations, however, a consensus has yet to be reached on a final acceptable draft Code. Fundamental disagreement remains on whether the Code should be legally binding or merely a set of guidelines. The latter

position is insisted upon by developed nations. Equally significant is the failure of developed nations to agree to the demands of developing countries that technology suppliers guarantee the termination of practices deemed to restrain economic development in the latter group's nations.

In the course of the negotiations, however, a major positive outcome has been the modification of multinational behavior in recent technology transfer transactions. Recognition of the seriousness of the developing countries' position and responsiveness to heightened global sensitivity toward past questionable practices have each contributed to the willingness of technology owners to bring their contracts more into conformity with new national regulatory schemes. Yet this behavioral adaptation is a far cry from agreeing on an all-encompassing Code. Thus, as will be discussed below, the successful implementation of technology transfer regulations through the UNCLOS III Convention may assist the developing countries' positions regarding a broader Code of Conduct.

THE THIRD UN CONFERENCE ON THE LAW OF THE SEA

Background

Developing nations have been unsuccessful in codifying their view that rules in a Code of Conduct on Transfer of Technology should be of a mandatory nature. Developed nations adamantly insist that the Code should provide guidelines only. At the Third United Nations Conference on the Law of the Sea (UNCLOS III), however, the idea of a mandatory transfer of seabed mining technology has firmly taken root.

The UNCLOS III negotiations have addressed issues involving fishing, national coastal jurisdiction, navigation, environment, scientific research, seabed exploitation and technology transfer. Initially, participants in the conference sought to agree upon as many distinct issues as possible, through separate treaties if necessary. Subsequently, however, the decision was made to tie the entire range of substantive areas together in one unified treaty [42]. Both the developing and the developed countries viewed this approach as desirable, because each group had specific objectives that it wanted to attain, at high costs if necessary. The developed nations, for instance, wanted firm rules on the freedom of navigation through straits and other ocean spaces that were coming under national jurisdiction. This scenario made much easier the developing countries' efforts to obtain agreement on the 200-mile exclusive economic zone and contributed to the incorporation of the "common heritage" of humankind doctrine into the seabed mining provisions [43].

Negotiators for the United States worked hard to stay in the forefront of developments, realizing that the Conference was codifying existing international practice relating to the oceans, as well as creating new legal principles. The consensus inherent in the UNCLOS III process has caused parts of the Convention to become customary international law already. Some observers have criticized pre-Reagan Administration negotiating teams of having a "treaty at any cost" attitude [44]. The

accomplishments in areas of primary substantive interest to the United States would not, however, have been possible without such enlightened flexibility [45]. Proponents of the view that the U.S. can do whatever it wants and under its own terms fail to recognize the critical fact of interdependence. The fates of both the developed world and the developing world are inextricably intertwined. Sooner or later, the United States will find it must return to the international arena and reach agreements with the other nations of the world.

Relationship of Other International Discussions

One of the concerns of the negotiators at UNCLOS III has been whether the various provisions of the Convention would have precedential effect upon other negotiations, and thus what effect this treaty would have on the overall North-South dialogue. The seabed provisions might, for instance, be viewed as a model for the negotiations on renewable energy resources, the regime to govern the moon and outer space, the use of Antarctica, commodities agreements, food cooperation, and environmental monitoring. In addition, the seabed mining provisions could affect the stalemated negotiations on the Code of Conduct on the Transfer of Technology. Developing countries have hoped that once the idea of sharing common resources is recognized in one treaty, it will become an accepted approach in other treaties as well. Developed nations, which argue that they have accepted the "common heritage" principle in the seabed negotiations because of the unique features of these resources and in order to effect a *quid pro quo* for agreements on other issues, assert that the UNCLOS III Convention should not become a model for other negotiations and agreements. Only time will tell which position holds.

Early Issue Formulation

The U.N. Conference on the Law of the Sea in 1958 resulted in conventions addressing the territorial sea, the high seas, the continental shelf, and fishing [46]. The seabed and its resources did not become a concern until the mid-1960's [47]. Malta's Ambassador Arvid Pardo focused concern in 1967 with his proposal urging that the ocean floor resources be considered part of the "common heritage" of humankind [48]. After several years of discussion [49], the U.N. General Assembly adopted in 1970 a Declaration of Principles which proclaimed,

1. The seabed and ocean floor, and the subsoil thereof, beyond the limits of national jurisdiction ... as well as the resources of the area, are the common heritage of mankind ...
7. The exploration of the area and the exploitation of its resources shall be carried out for the benefit of mankind as a whole, irrespective of the geographical location of States, whether land-locked or coastal, and taking into particular consideration the interests and needs of the developing countries [50].

Disagreement has continued, however, on the meaning of "common heritage," on whether it means common ownership and international control of the resources on the deep seabed.

U.S. mining interests have argued that they have the authority to mine the deep seabed, in the absence of a multilateral treaty. Because of the instability of such a situation, these arguments may have been made for negotiating purposes rather than because the mining companies seriously imagined mining without the protections of a multilateral treaty. By 1978 three major deep seabed issues required resolution by the First Committee of UNCTAD III: (1) political control of the Authority [51] (the Council's jurisdiction, composition, and voting system); (2) the Authority's resource and production policy; and (3) the system of seabed exploitation including the technology transfer provisions [52]. The remainder of this paper will focus on the third issue -- the transfer of seabed technology.

General Principles on Transfer of Marine Technology Under Part XIV of the Convention

The general governing principles on technology transfer are found in Part XIV of the UNCTAD III Convention entitled, "Development and Transfer of Marine Technology." This Part provides for development and transfer of technology for exploration, exploitation, conservation and management of marine resources, protection and preservation of marine environment, marine scientific research and other activities compatible with the Convention. The aim is to promote use of ocean resources and accelerate the social and economic development of the developing states [53]. States parties are required to promote certain basic objectives, such as the acquisition, evaluation and dissemination of marine technological knowledge, the facilitation of access to such data, the development of appropriate technology, the development of necessary technological infrastructure to facilitate the transfer of marine technology, the development of human resources through training and education programs, and international cooperative efforts at regional, subregional and bilateral levels [54]. They are supposed to achieve these goals through the use of programs, promotion of favorable conditions for conclusion of agreements, holding of conferences, exchange of scientists, and utilization of joint ventures [55]. The objectives of the Seabed Authority are to be met by using developing country nationals on the Authority's managerial, research and technical staffs, making technical documentation available to all states, and easing the acquisition of skills, know-how, professional training, equipment, processes, plant and other technical know-how [56]. Finally, these efforts are to be aided by establishment of national and regional marine scientific and technological centers [57].

In setting out these objectives, however, the Third Committee did not provide assurances adequate to developed nations that their proprietary interests and extensive investments would be protected. The only language on this

question states that in promoting the cooperation mentioned above, states "shall have due regard for all legitimate interests, including, inter alia, the rights and duties of holders, suppliers and recipients of marine technology." [58] Some critics of the Convention have focused on this weak language as a major reason for approaching the entire treaty with caution [59].

These same principles govern the treatment of technology transfer in Part XI of the Convention, which deals directly with the seabed. Transfer of technology, broadly speaking, is to be overseen under Article 144, by the International Seabed Authority, which is to coordinate the acquisition of technology for developing States and the Enterprise, under "fair and reasonable terms and conditions." [60] The developed nations have complained because this provision omits any reference to "commercial" terms and conditions [61]. The bare concept of "fair and reasonable" is viewed as inadequate by developed country standards, because it fails to take into account market forces [62]. The term "commercial" is, however, inserted in Annex III to flesh out the skeletal provisions of Article 144 [63].

THE SEABED MINING INDUSTRY

Introduction

Article 153 of the UNCLOS III Convention sets the basic direction for exploration and exploitation in the deep seabed, declaring that activities in the seabed shall be carried out by (1) the Enterprise [64] and (2) states parties or states entities, or natural or juridical persons which possess the nationality of states parties or are effectively controlled by them or their nationals, when sponsored by such states [65]. These activities shall be carried out only after approval of plans of work submitted to the International Seabed Authority, subject to requirements in the annexes [66]. This structure has been called a "parallel system" of exploration and exploitation. In the spring negotiating session of 1982, amendments were made to give specific advantages to the "pioneer" investors, the initial consortia that have invested in this industry.

The Technology

Mining is by nature a highly capital-intensive and volatile industry, on land and at sea. It requires extremely large initial capital outlay, often years in advance of production, and is subject to widely fluctuating price swings in the metals markets. Research and development costs can be exorbitant, but much of the technology is applicable in a variety of situations, thus allowing cost spreading. These factors contribute to the characterization of mining as a risky business. It is always difficult to obtain financing for projects because banks tend to be quite conservative institutions. Nonetheless mining industries are essential to the productivity and prosperity of both the developed and developing nations.

Ocean mining must face all of these problems, and also the expense and difficulty of creating the new technologies required for prospecting and extracting minerals from the ocean floor. These novel technologies can only be developed after expenditure of huge sums on research and development. An additional complication is that development of extraction technology is extremely site-specific or site-dependent, not only for site refining exploration, but also for design and acquisition of dredge heads, refining plants, and to some extent, ships and lift systems [67]. Without some certainty that it will have rights to a particular site, a company interested in ocean mining cannot launch an investment program of hundreds of millions of dollars for appropriate technological development.

One recent report outlines two alternative systems not yet properly tested, but under current consideration for use in seabed mining [68]. The first concept is a variation on the airlift system presently employed in most projects:

The concept is based on the creation of a low density of the slurry mixture in the transport pipe (as does the airlift), however, with a significant reduction in power consumption ... achieved by using non-expanding light particles mixed with the water/nodule slurry instead of compressed air. The system consists of an essentially vertical pipe for the slurry transport, one or more pipes for the downward transportation of the light particles, and an installation to sluice these particles into the pipe [69].

By using a water pump and pressurizing the pipe, an airlock will be created to draw the nodules. It has been estimated that a 50% decrease in energy consumption could result without even requiring significant alteration of present airlift system nodule mining vessels [70].

The second concept is based on vertical capsule transport. This design makes use of a collector system suspended from a semi-submerged buoy, with nodules collected and lifted through a riser pipe, inside capsules. The driving force would be a pressure differential created over the two legs of the transport pipe. The apparent advantage of the system is that it will be energy efficient, although mechanically more complex than the airlift system [71].

The Consortia

Technological complexities such as those just described stimulated the creation of joint ventures and ocean mining consortia. These consortia comprise firms from several countries, although most are dominated by U.S. companies. They not only share information and expertise, but also spread risks, share the high equity commitments, and gain a broader measure of support from their respective governments negotiating at UNCLOS III [72].

When Will the Industry Begin?

Why has the commencement of commercial operations been delayed? First, delays have occurred because there have been "greater difficulties than anticipated in scaling equipment designs up to full commercial size and reliable operation at actual minesite depths"[73]. A second cause has been the imposition of limits on available financing for continued work. As mentioned above, mining is a risky business and banks have approached it very conservatively, when doing loan analyses. A third ground for delay is the technological restriction created by seabed mining technology's mine-specific nature. In the absence of assurances that mining will be permitted on a specific mine site, companies are less likely to risk the great sums necessary to prepare for production. Development of a single mine site would cost approximately \$1 billion [74]. This extraordinary cost leads to the fourth factor causing a delay -- the uncertain political climate created by the divisions among the nations at the UNCLOS III negotiations. Companies have been concerned that they may not be able to retain sites if they proceed to mine now, and that they may not be able to get a favorable return on their investments under the regime envisaged in the Convention.

THE TRANSFER OF SEABED MINING TECHNOLOGY UNDER ANNEX III

Introduction

Annex III of the UNCLOS III Convention contains 22 articles detailing the "basic conditions of prospecting, exploration and exploitation." These provisions approach the resources of the seabed from the perspective recognized in the 1970 Declaration of Principles that these resources are the "common heritage" of humankind and that they should be developed by "taking into particular consideration the interests and needs of the developing countries." [75] Annex III has also been drafted in light of the experience gained by developing nations that have required technology transfer in their bilateral investment negotiations in recent years.

Annex III begins by outlining the rules governing prospecting [76] and the exploration and exploitation [77] of minesites. The International Seabed Authority is instructed, in evaluating applications, to favor those applicants that will: "(a) give better assurance of performance, taking into account the financial and technical qualifications of the proposed operator and performance, if any, under previously approved plans"; "(b) provide earlier prospective financial benefits to the Authority, taking into account when production is scheduled to begin"; and "(c) have already invested most resources and effort in prospecting or exploration" [78]. These criteria favor the Western consortia that have already made progress in the development of ocean mining processes. These consortia have, however, been concerned about whether they will be able to recover their high initial investments on the basis of a single mine site, should they be so limited.

In response to these concerns, the Conference passed in its spring 1982 session Resolution 11 Governing Preparatory Investment in Pioneer Activities Relating to Polymetallic Nodules, commonly referred to as the Preparatory Investment Protection (or PIP) Resolution [79]. The PIP Resolution states that eight sites are to be set aside for "pioneer investors," those already exploring the seabed. Four are reserved for the major consortia dominated by U.S. concerns, and one each is held for France, Japan, India and the Soviet Union [80]. In addition, the Enterprise will be able to operate as a pioneer investor. Rights of these pioneer investors are assignable [81].

The PIP Resolution describes what activities are allowable, how portions of the pioneer area will revert to the international area over time, what requirements must be met in order to register as a pioneer investor, how disputes are to be settled, fee schedules, and methods for allocating production authorizations. No entity may become a pioneer investor unless it is sponsored by a state party to the Convention [82]. Pervading the entire design is an essential symmetry with the cognate provisions regarding exploration, approval of work plans, and the training and transfer of technology which are governed by Annex III, Article 5 of the Convention. The Conference intended, however, that the PIP Resolution have effect only until the entry into force of the Convention itself [83]. The PIP Resolution was not adequate to satisfy the dissenting U.S. delegation. Chief U.S. Delegate James L. Malone lamented that "while providing access to pioneer firms, the treaty does not ensure that other qualified miners from the private sector will have access to future mine sites" [84].

Mandatory Transfer Under Article 5

At the heart of Annex III is the controversial article imposing a mandatory technology transfer scheme, Article 5. The transfer requirements begin even before approval of a work plan. Each application must provide "a general description of the equipment and methods to be used in carrying out activities in the Area, as well as other relevant non-proprietary information about the characteristics of such technology, and information as to where such technology is available" [85]. This requirement is similar to the "screening" done by developing countries when considering technology transfer proposals in individual nations. This language has nonetheless caused consternation among Western delegations, particularly the extent to which non-proprietary descriptions must be provided.

If its work plan is approved, the operator must update the Authority on the descriptions given, if a "substantial technological change or innovation is introduced" [86]. Approved plans take the form of contracts between the Authority and the operator [87], each contract containing a series of undertakings by the operator. These undertakings -- found in paragraph 3 of Article 5 -- constitute the core of the developing countries' demands on access to seabed mining technology.

Primarily, an operator must make available to the Enterprise, upon demand, technology which it actually uses in carrying out the approved activities. This technology must be made available on "fair and reasonable commercial terms and conditions." The transfer may be accomplished by licensing or any other appropriate means agreed upon in negotiations with the Enterprise [88]. The Enterprise may only invoke this mandatory transfer provision if it is unable to obtain "the same or equally efficient and useful technology on the open market on fair and reasonable commercial terms and conditions." [89]

These provisions have been controversial for several reasons. First, even though the term "commercial" has been inserted in the "reasonable terms" clause, it is hard to reconcile a mandatory transfer with commercial terms and conditions [90]. The mandatory nature reduces the bargaining position that the technology owner would have in a normal market transaction. Second, the technology that is to be transferred is that which the operator actually uses [91]. This point of clarification was made at the Ninth Session in the summer of 1980 in order to "avoid any implication that [the operator] might be required to transfer technology before he has used it himself" [92]. The previous wording had left this question unresolved. Third, the transfer obligation extends only to technology that the operator is legally entitled to transfer [93], but the operator has an obligation under subparagraph 3(b) to obtain certain technology. Fourth, the condition precedent for the invocation by the Enterprise of these provisions, the inability to acquire "the same or equally efficient and useful technology" [94], implies that the Enterprise would have to make a good faith effort to obtain the technology on the open market. This interpretation was tendered by the UNCLOS III co-ordinator for matters relating to the over-all exploitation of the seabed, Mr. Harry Wuensche of the German Democratic Republic [95]. With the technology only beginning to emerge, however, this clause is likely to have little meaning, because virtually no technology available on the open market will be comparable to that which the applicant parties hope to employ in their mining operations. This situation might change if some of the consortia decide to license or sell their technological developments, rather than depending on profits from their own full-scale ventures. Such an approach could help recoup some research and development expenses. Nonetheless, few major proprietors are expected to develop systems exclusively for sale to the Enterprise because they would probably not be able to recover their substantial investments, much less earn a favorable return. Further limiting this clause's appeal is the absence of any definition of "equally efficient and useful technology." The developed nations have been concerned that this language will allow the Enterprise to request the transfer of the operator's technology virtually at will.

Once the Enterprise does turn to the operator for its technology, the technology is to be made available by agreement between the parties. Disputes over whether the deal is being

closed on truly commercial terms and conditions can be submitted to binding commercial arbitration similar to that used in other international business transactions, utilizing the recently devised UNCITRAL rules, or similar ones [96]. Only offers made by the operator are subject to such arbitration on the question of commercial reasonableness, although either party may submit the dispute to arbitration [97]. Negative determinations (against the operator) by the tribunal do not result in automatic action against the operator. Rather, it has 45 days in which to revise its offer before the Authority may impose penalties for violation of contract [98].

One major problem, as mentioned above, is the situation in which the operator is licensing seabed mining technology from a third party and does not have the right to alienate it or sublicense to anyone else. How then can the operator transfer it to the Authority? Subparagraph 3(b) of Article 5 was written to respond to this situation [99]. Any operator using technology for mining, under an approved plan, which does not own that technology or the legal right to transfer it, must obtain written assurances from the owner thereof that the owner will, upon request from the Enterprise, make the technology available to the Enterprise to the same extent as made available to the operator, under license or other negotiated form. This provision applies only if the technology is not available on the open market. Operators failing to negotiate this assurance in the course of contracting for the use of a third party's technology are precluded from carrying out activities in the Area [100].

Acquisition of the right to transfer technology to the Enterprise is required by subparagraph 3(c), "whenever it is possible to do so without substantial cost to the contractor." [101] Since the word "substantial," is not defined, the intent of this provision is a matter of controversy. The United States' interpretation has been that "[i]t was understood that the Enterprise would bear any substantial cost resulting from carrying out these obligations if the Enterprise requested the contractor to acquire such a legal right." [102] The language goes on further to state that the operator must take "all feasible measures" to accomplish this required goal [103]. In evaluating whether such measures have been taken, the Authority is instructed to be on the watch for any "substantial corporate relationship" which may exist between the operator and the owner of the desired technology [104]. The closeness of the relationship and degree of control or influence exerted over the owner will be considered relevant in this determination. Should the operator exercise effective control over the owner and be unable to acquire these rights, this fact is likely to prejudice its chances for gaining approval of any subsequent plan of work [105]. Thus, attempts to avoid these requirements through use of dummy corporations should be doomed to failure.

If for any reason the Enterprise decides to enter into negotiations with the owner of the technology directly, the operator is bound to facilitate the acquisition by the

Enterprise of the desired technology. Once again, this occurs upon the inability of the Enterprise to first purchase on the open market [106].

One of the stickier issues of the Conference relating to technology transfer had been the requirement, in subparagraph 3(e), that the measure prescribed above shall apply not only to the Enterprise, but also for the benefit of a developing state or group of developing states applying for a contract on one of the reserved sites [107]. These requirements are not supposed to apply if it would involve the transfer of the rights to third states or their nationals, either immediately or ultimately [108], and these standards are activated only when the Enterprise itself has not requested the technology from the operator [109]. Nonetheless, this clause has been bothersome because it does not have enough bite to ensure that developing nations and their respective nationals will not divulge to third parties proprietary knowledge submitted in confidence by the operator.

Means of Ensuring Enterprise Access to Technology

Failure of operators to comply with the measures mandating either transfer of technology to which they have legal rights or acquisition by them of such rights was originally to be dealt with by blacklisting the operators and owners. Considerable disgruntlement over such an approach caused its abandonment. As a compromise, paragraph 5 contains an obligation on the part of states parties to be responsible for acquiring the technology in certain of these circumstances [110]. The Council or Assembly may convene a group of states parties composed of those which are engaged in activities in the seabed, those which have sponsored entities which are engaged in such activities and those having access to the requisite technology. The group is to act in unison to ensure provision of the technology necessary for the Enterprise to begin "in a timely manner" the recovery and processing of minerals. Individual states parties are to take all feasible measures to this end within the bounds of their respective municipal legal systems [111].

This provision indicates not only that governments may be required to incur appreciable expense and possibly to intervene in their national marketplace via expropriation or other means, but further implies that the Enterprise must be given processing technology, too. This interpretation appears to be inconsistent with the purposeful deletion of any reference to technology for processing or other "downstream" activity in the other relevant sections of the Convention [112]. Equally troublesome is the fact that states are unlikely to effectuate fully the intent of this clause where such action would be violative of traditions and legal rights guaranteed by their respective constitutions, national charters, or other sources of domestic legal principles.

Joint Ventures

For the special case of joint ventures between the Enterprise and any other qualified applicant or state party, the transfer of technology shall be regulated explicitly in accordance with the terms of the joint venture agreement [113]. In negotiating this special case, the Conference participants felt the Enterprise will have sufficient bargaining power and skill to obtain what it needs. An incentive structure is to be created in order to encourage such joint ventures [114]. The Enterprise will probably be successful in these endeavors because its participation will make approval of a venture virtually certain, thus providing a stimulus to those other entities with appropriate technology which are anxious to begin operations.

Time Limits

The time limit clause on the transfer of technology, revised several times in the course of negotiations, now establishes a ten-year period after the Enterprise begins its operations:

The undertakings required [of the operator] by paragraph 3 shall be included in each contract for the conduct of activities in the Area until 10 years after the Enterprise has begun commercial production of minerals from the resources of the Area and may be invoked during that period [115].

Prior versions of this clause provided that such undertakings would be included in contracts only until the Enterprise had begun commercial production. The compromise was reached on the basis of the United States and other industrialized States seeking a 5-year limit and the developing states pushing for no time limit -- i.e., a never-ending obligation. The former group agreed to a 10-year period in exchange for "assurances" by the latter group that it would not press for inclusion of processing technology in the transfer obligations of Article 5 [116].

Even if companies should see some means by which to delay the use of the most advanced and productive technologies until after this 10-year period has expired, thus avoiding the transfer obligations temporarily, they are still not able to predict with certainty that they will be "home free" owing to the mandatory Review Conference imposed by Article 155 of the Convention [117]. On a more practical level, however, the economic realities are such that it is inconceivable that a company would take the risk of not jumping in and proceeding as productively as possible in order to recapture its investment. Thus, a delay scenario is not a strong possibility.

What Technology is Included?

Comprehensive and broad though it is, the definition of technology incorporated into the Convention does not include processing, marketing or transportation technology [118].

Developing country representatives earnestly sought the inclusion of these varieties, but they were deleted as not being unique to seabed mining. In particular, developed nations did not want to assist developing country land-based producers of metals contained in the polymetallic nodules by providing them with processing technology.

As agreed upon under the current Convention, technology encompasses:

... the specialized equipment and technical know-how, including manuals, designs, operating instructions, training and technical advice and assistance, necessary to assemble, maintain, and operate a viable system and the legal right to use these items for that purpose on a non-exclusive basis [119].

This definition focuses on those aspects of the technological process necessary for ocean mining that are not available on the open market. The requirement that training of personnel be promoted is further strengthened by Article 15, which calls for the contractor to draw up training programs for personnel of the Authority and developing states [120].

Confidentiality of Data

The transfer of data provisions in Article 14 impose additional obligations on the operator. This article requires the transfer of ~~non-proprietary~~ data relevant to the work of the Authority, such as those necessary for promulgation of rules regarding environmental protection and safety [121]. These two areas specifically are deemed to be ~~part of~~ non-proprietary in nature [122]. Data submitted to the Authority are to be held in the strictest confidence, no disclosure outside of the Authority being tolerated. Likewise, data given to the Enterprise with regard to the reserved sites may not be revealed outside of the Enterprise, not even to the Authority [123]. Persons on the staffs of either the Authority or the Enterprise may not divulge any industrial secrets or data of a proprietary nature or they will be subject to reprimand from a special tribunal, possibly leading to their dismissal [124].

The weak "teeth" of this sanction do not comfort the developed nations worried about adequate and effective protection for their costly investments and resultant processes. They feel that staff members would certainly risk mere dismissal in return for lucrative rewards for a bit of marine industrial espionage or leaking of proprietary information. A possible stronger sanction would have been for nationals to be subject to criminal prosecution for confidentiality violations.

Miscellaneous Provisions

In addition to the technology transfer scheme as such, a well-defined system of "user charges" applies to the operator of a seabed mine. These financial terms are outlined in Article 13 [125]. Annex III also manages to incorporate the concept of

rebus sic stantibus (the doctrine of changing circumstances) [126] in its recognition that a time may arise when either party to the mining contract -- that is, the operator or the Authority -- feels circumstances have evolved, or may yet evolve, that render the contract inequitable, impracticable or make impossible the achievement of the original contract objectives. In this instance, the parties shall enter into negotiations anew to effectuate necessary adjustments [127]. This concept creates significant opportunity to keep abreast of technological improvements. The article, however, fails to create any obligation actually to reach agreement on new terms. It is unclear what happens if no agreement is reached. Perhaps the review structure built into Part XI of the Convention may serve to fill some of these textual holes.

Further limiting the operator is the prohibition of transfer of its rights arising out of the contract without prior consent of the Authority [128]. Such permission is not to be unreasonably withheld, reasonableness being based on an evaluation of whether the proposed transferee is in all respects a qualified applicant and whether it will assume all the obligations of the original operator [129].

Penalties that can be imposed on an operator that refuses to abide by the prescribed rules and decisions of the Authority include suspension or termination of rights under the contract, monetary penalties proportionate to the seriousness of the offense, and prejudice to consideration for approval of future work plans and proposals [130]. Suspension or termination shall occur only for serious, persistent and willful violations of the fundamental terms of the contract or if the operator fails to comply with a final, binding decision of the applicable dispute settlement body. Monetary sanctions are to be awarded in lieu of suspension or termination. In each instance, except for emergency cases [131], the Authority may not punish an operator until the operator has had a reasonable opportunity to exhaust remedies available under Part XI [132].

By virtue of its compliance with the provisions in Article 5 and related articles, the operator obtains an exclusive right to exploit the area covered by the plan of work in respect of a specified category of minerals (which is totally dependent on existing resource production policies of the Authority at the time of application). It is also guaranteed that no other operator active in the same area, although for another category of minerals, will interfere with its operations. Finally, the operator is given security of tenure [133].

CONCLUSION

Neither side gained all of its goals in the decade-long debate over the technology transfer provisions that govern seabed mining. The developing states wanted to (1) extend the time-limit on the transfer obligation, (2) strengthen further the obligation to transfer third party technology, (3) enlarge the definition of technology to include processing, marketing,

and transportation technology, and (4) obtain more assurances that the contractor would comply with its commitments [134]. The developed states not only opposed each of these goals, but themselves wanted greater protection of proprietary interests and protection of preparatory investment [135]. This latter desire was partially satisfied in the form of the PIP Resolution adopted in the spring of 1982. Now that the negotiations have been concluded, it will be seen how the agreed-upon provisions work in actual practice.

The United States wanted to avoid setting any precedents in the Convention on the Law of the Sea that might establish a precedent for other international negotiations [136], and vigorously opposed the mandatory seabed provisions for this reason. The U.S. delegation also wanted to take advantage of the technological edge held by Western corporations to gain as much access to the important minerals in the polymetallic nodules as would be possible. Although the Convention was adopted overwhelmingly without concession to the United States on these issues, several other important changes were made [137] and the PIP Resolution gives the Western consortia some significant advantages and provides an incentive for the Western nations to sign and ratify the Convention.

It seems unlikely that the huge investments necessary to begin mining the nodules will be made outside the framework of the Convention's rules, because a consortium claiming a site could not be assured of being able to remain at that site undisturbed for long enough to recoup the investment. Such a free-for-all approach would not work in the interest of the major maritime nations, because it would encourage coastal states to claim ocean space out to a mine site and might lead to the evolution of new customary international law recognizing extended zones of national jurisdiction that would include the deep oceans adjacent to the exclusive economic zone [138].

The mandatory technology transfer provisions are onerous if given the "worst case" interpretation raised hypothetically by the U.S. negotiators during the spring 1982 negotiating session [139]. These provisions are susceptible to a more reasonable interpretation, however, and if the United States and the other developed nations participate actively in the Preparatory Conference they could help ensure that the interests of the private investors are understood when the details are worked out.

The developing nations have grown accustomed to asking for technology transfer for investments within their countries. In 1970, the world appeared to have decided that the resources of the deep seabed were the "common heritage" of humankind and that special provisions were to be made to ensure that the developing nations would benefit from the development of this resource [140]. The delegates at the Third United Nations Conference on the Law of the Sea translated that decision into the technology transfer provisions that now appear in the text of the Convention.

Investment is still continuing actively in the developing world despite mandatory technology transfer requirements, because the investments make economic sense even with these requirements. It is probable that after the private economic interests in the developed world take a long hard look at the completed Convention, they will likewise conclude that it makes more economic sense to invest in seabed mining within the framework of the International Seabed Authority than to proceed under the uncertain protection of the few Western nations that did not join in supporting the Convention.

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NOTES

1. United Nations Press Release, SEA/494 (April 30, 1982) at 1.
2. For descriptions of the progress of the negotiations, see generally Stevenson & Oxman, The Preparations for the Law of the Sea Conference, 68 Am. J. Int'l L. 1 (1974); Oxman, The Third United Nations Conference on the Law of the Sea: The 1974 Caracas Session, 69 Am. J. Int'l L. 1 (1975); Oxman, The Third United Nations Conference on the Law of the Sea: The 1975 Geneva Session, 69 Am. J. Int'l L. 763 (1975); Oxman, The Third United Nations Conference on the Law of the Sea: The 1976 New York Session, 71 Am. J. Int'l L. 247 (1977); Oxman, The Third United Nations Conference on the Law of the Sea: The 1977 New York Session, 72 Am. J. Int'l L. 57 (1978); Oxman, The Third United Nations Conference on the Law of the Sea: The Seventh Session (1978), 73 Am. J. Int'l L. 1 (1979); Oxman, The Third United Nations Conference on the Law of the Sea: The Eighth Session (1979), 74 Am. J. Int'l L. 1 (1980).
3. Declaration on the Establishment of a New International Economic Order, G.A. Res. 3201, 6 U.N. GAOR Special Supp. (No. 1), U.N. Doc. A/9559 (1974); Programme of Action on

- the Establishment of a New International Economic Order, G.A. Res. 3202, 6 U.N. GAOR Special Supp. (No. 1), U.N. Doc. A/9559 (1974). The Declaration calls for recognition of State's permanent sovereignty over their natural resources, regulation of multinational corporations, preferential treatment for LDC's, access of LDC's to technology possessed by the West, and rights to nationalize foreign-owned property when deemed necessary by the local authorities.
4. Charter of Economic Rights and Duties of States, G.A. Res. 3281, 29 U.N. GAOR Supp. (No. 30), U.N. Doc. A/9631 (1974) (hereinafter cited as CERDS). Article 13 of CERDS specifically recognizes the need for LDC's to acquire technology on terms appropriate to their own capacity to pay for and benefit from such transfers. CERD's was not accepted by the United States and other OECD states, even though adopted 120-6-0.
 5. Transfer of technology alone clearly will not solve the problems of the developing world. Transfer of technology is useless without adequate capital and resources. The way a nations organizes its economy may also be relevant. See, e.g., Chapman, Underwater Plunder, The New Republic, Apr. 21, 1982 at 19.
 6. Mirabito, The Control of Technology Transfer -- The Burke-Hartke Legislation and the Andean Foreign Investment Codes: The MNE Faces the Nations, 9 Int'l L. 215, 216 (1975).
 7. Junta del Acuerdo de Cartagena, Technology Policy and Economic Development: A Summary Report of Studies Undertaken by the Board of the Cartagena Agreement for the Andean Pact Integration Process 3 (1976) [hereinafter cited as Junta].
 8. Perlmutter, Perplexing Routes to MNE Legitimacy -- Codes of Conduct for Technology Transfer, 11 Stan. J. Int'l Stud. 169, 176 (1976).
 9. *Id.* at 177.
 10. K. Ko, Korean Laws and Policies on Importation of Foreign Technology 37 (1978).
 11. Revised Text of Draft Outline of an International Code of Conduct on the Transfer of Technology: Submitted on Behalf of the Experts from the Group of 77, UNCTAD, U.N. Doc. TD/AC, 1/9, Annex II (1977), reprinted in 17 I.L.M. 462 (1978); Revised Outline of a Code of Conduct Consisting of Guidelines for the International Transfer of Technology: Submitted on Behalf of the Experts from Group B, UNCTAD, U.N. Doc. TD/AC, 1/9, Annex III (1977), reprinted in 17 I.L.M. 473 (1978); Draft International Code of Conduct on the Transfer of Technology (as at the close of the third session of the Conference on 6 May 1980, UNCTAD, U.N. Doc. TD/Code TOT/25 (1980), reprinted in 19 I.L.M. 773 (1980).
 12. Conboy, The Group of 77 Draft Provisions Concerning Supplier Guarantees for the Proposed International Code of Conduct on Transfer of Technology, 9 Ga. J. Int'l and Comp. L. 69, 76 (1979).

13. Patents and trademarks are the main legal instrument utilized in regulating industrial proprietary technology. The international legal regime of the Paris Convention on the International Union for the Protection of Industrial Property of 1883 (21 U.S.T. 1583; 24 U.S.T. 2140; T.I.A.S. No. 6923, 7727) influences most countries' approaches to patent regulation. Over 100 nations are parties to this Convention today. The Paris Convention regime reflects the underlying premise that a patent will be granted to an inventor, protecting his invention from being used or copied by others, as a means of encouraging public disclosure of scientific advances. The period of protection is limited in duration, at the end of which the technology is in the public domain. The Convention set out a scheme whereby foreign inventors could be granted open access to national markets in other States. This system has, however, backfired for the developing countries. All but a few of the world's patents are in fact owned by persons or corporations in the developed world. Because these patents are not required to be actually worked and because the patents are protected for substantial periods (often 17 years), corporations can control technology and markets in many developing nations where patents have been registered. For a general overview of the international patent structure and an examination of Third World attitudes toward the existing system, see Jayagovind, The International Patent System and Developing Countries, 20 Indian J. Int'l L. 47 (1980); UNCTAD, The Role of the Patent System in the Transfer of Technology to Developing Countries, U.N. Doc. TD/B/AC.11/19/Rev. 1 (1975); UNCTAD, Report of the Group of Governmental Experts on the Role of the Industrial Property System in the Transfer of Technology, Annex V, U.N. Doc. TD/B/C.6/AC.3/4, Add. 1 (1977).
14. Egea, Multinational Corporations in the Operation and Ideology of International Transfer of Technology, 10 Stud. Comp. Int'l Dev. 11, 18 and 20 (1975).
15. Report of the United Nations Conference on Science and Technology for Development, Vienna Program of Action on Science and Technology for Development, U.N. Doc. A/CONF. 81/16 (1979), reprinted in 18 I.L.M. 1608, 1610 (1979).
16. Conboy, *supra* note 12, at 76 and 78.
17. One example is the four-fold increase in developing country payments deficits from 1973-74 triggered by the oil situation during these years. See Stephen Minikes, (Senior Vice President of Export-Import Bank of the United States), remarks at the 1977 American Bar Association Workshops, cited in Brown, Changing the Rules: International Law and the Developing Countries -- The ABA Workshops of 1977, 12 Int'l L. 265, 271-3 (1978).
18. Breaux, Technology Transfer: A Case Study of the Inequity of the New International Economic Order, 13 Marine Tech. Soc. J. 19 (July 1979).

19. The scenario is analogous, albeit not identical, to the post-World War II situation in which the Marshall Plan was implemented. United States' generosity in giving other nations access to our skills and in transferring massive doses of technical and financial aid may have contributed somewhat to the economic superiority of the U.S. being challenged by Japan and West Germany, two of the recipient nations. Nonetheless, the creation of a stable world economy and development of world markets for U.S. goods has also resulted in tremendous competitive advantages for U.S. firms. Unless we adopt radical changes in our lifestyle, our present situation of resource dependence on foreign nations requires that we listen to the concerns of the Third World with extremely attentive ears. This dependency dilemma exists for the rest of the developed world as well. Failure to modify our behavior could be fatal since the potential for resort to violence on a large scale in order to protect unstable sources of raw materials is very real.
20. See, e.g., Junta, *supra* note 7, at 78-9.
21. See Parker, Licensing to Developing Countries, in Current Trends in Domestic and International Licensing, 409-10 (1977).
22. See Junta, *supra* note 7, at 48-9.
23. Of course, Japan has had solid financial backing and security assurances from the U.S. allowing it to concentrate its scarce available resources on economic development. Japan's historical tradition of borrowing from China and other cultures has also made the adoption and adaptation of foreign technology all that much easier. Nonetheless, its screening procedure has certainly aided and accelerated the process.
24. See Carl, Technology Transfer: Law and Practice in Latin America 147 (1978).
25. Parker, *supra* note 21, at 412-413.
26. Between 1961 and 1968, Latin America had a deficit on current account in its balance of payments. In its trade balance, in 1968, Latin American exports totalled \$12 billion, and imports were \$10.6 billion, giving an initial surplus of \$1.4 billion. But adding a deficit of \$3.6 billion for services, investment charges (flows for services, insurance, return of capital and services on debt), gave Latin America an overall trade deficit in 1968 of \$2.2 billion. The Latin share of world markets dropped from 7.2% in 1961 to 6.7% in 1968. Ironically, during this period in which foreign investment was increasing in Latin America, Latin America's market share had dropped. Mirabito, *supra* note 6, at 217.
27. Mirabito, *supra* note 6, at 232.
28. Jeffries, Jeffries, Regulation of Transfer of Technology: An Evaluation of the UNCTAD Code of Conduct, 18 Harv. Int'l L. J. 309, 319 (1977).
29. Mexican Law on the Registration of the Transfer of Technology and the Use and the Exploitation of Patents and

Trademarks, Law of Dec. 28, 1972 (Mex), translated in 12 J.L.M. 421 (1973) [hereinafter cited as Mexican Technology Transfer Law].

30. Soberanis, Legal Aspects Concerning the Technology Transfer Process in Mexico, 7 Ga. J. Int'l and Comp. L. 17, 18 (1977).
31. Mexican Technology Transfer Law, *supra* note 29, at art. 2.
32. Hyde & de la Corte, Mexico's New Transfer of Technology and Foreign Investment Laws -- To What Extent Have the Rules Changed?, 10 Int'l L. 231, 233 (1976).
33. *Id.* at 234.
34. Soberanis, *supra* note 30, at 27.
35. Hyde & de la Corte, *supra* note 32, at 234. Article 7 provides that the Ministry of Commerce and Industry shall not register acts, agreements or contracts which meet any of the following criteria:
 - I. When their purpose is the transfer of Technology freely available in the country, provided this is the same Technology;
 - II. When the price or consideration does not represent the Technology acquired or constitutes an unjustified or excessive burden on National Economy;
 - III. When provisions are included which permit the supplier to regulate or intervene, directly or indirectly, in the administration of the transferee of the Technology;
 - IV. When there is an obligation to assign onerously or gratuitously to the supplier of the Technology, the patents, trademarks, innovations or improvements obtained by the transferee;
 - V. When limitations are imposed on technological research or development by the transferee;
 - VI. When there is an obligation to acquire equipment, tools, parts, or raw materials exclusively from any given source;
 - VII. When the exportation of the transferee's products or services is prohibited, against the best interests of the country;
 - VIII. When the use of complementary technologies is prohibited;
 - IX. When there is an obligation to sell the products manufactured by the transferee exclusively to the supplier of the Technology;
 - X. When the transferee is required to use permanently personnel designated by the supplier of the Technology;
 - XI. When the volume of production is limited or sale or resale prices are imposed for domestic consumption or for exportation;
 - XII. When the transferee is required to appoint the supplier of Technology as the exclusive sales agent or representative in Mexico;

- XIII. When an unreasonable term of duration is established. Such term shall in no case exceed 10 years, obligatory for the transferee;
- XIV. When the parties submit to foreign courts for decision in any controversy in the interpretation or enforcement of the foregoing acts, agreements or contracts.

Cited in Soberanis, supra note 30, at 21.

36. For example, the contract must specify the payments to be made by the proprietor -- i.e., must state a basis for consideration. A comparison of payments made in similar contractual arrangements in Mexico and abroad is carried out with the assistance of the National Board of Science and Technology. Soberanis, *supra* note 30, at 23-4. Tie-ins are allowed only when raw materials are not available locally or when the supplier guarantees to charge prevailing international prices for industrial materials provided. Finally, "only an outright sale, as opposed to a mere license for the temporary use, of technology is permissible, and ... such sale is required to be fully consummated within the shortest practicable period of time." Hyde & de la Corte, *supra* note 32, at 238. Under this reasoning, only when the supplier can show that the technology recipient is acquiring genuinely new technology will contracts be renewed. Jeffries, *supra* note 28 at 321, citing Camp and Rojas-Magnon, Recent Developments Under the Mexican Foreign Investment Law and the Law Regulating the Transfer of Technology, 8 *Lawyer Americas* 1, 16 (1976).
37. Hyde & de la Corte, *supra* note 32, at 251. The authors explain this phenomenon by reference to the following report:

According to information published in the monthly organ of the Mexican National Foreign Trade Bank (Banco Nacional de Comercio Exterior), 5625 technology agreements were submitted to the Ministry between January 29, 1973 and April 30, 1974. Of these, 4112 were agreements in existence on January 29, 1973 submitted so that the Ministry could take note of them, and 1513 were new agreements submitted for registration. Of the latter number, 834 had been formally acted upon by April 30, 1974, of which 535, or 64%, had been denied registration for one or more reasons set forth in the Technology Law ... As of April 30, 1974, almost one-third of the technology agreements denied registration in the first instance had been granted registration, and the majority of the remaining two-thirds were in the process of renegotiation. A petition for reconsideration had been filed with respect to only a very few.

- Id., citing de Marla y Campos, La Política Mexicana Sobre Transferencia de Tecnología: Una Evaluación Preliminar, 24 COMERCIO EXTERIOR 463 (1974).
38. See Ko, *supra* note 10; Yoon, Legal Aspects of Doing Business In and With the Republic of Korea, in Current Legal Aspects of Doing Business In Japan and East Asia 362 (J. Hailey ed. 1973).
39. See, e.g., the 1969 Andean Subregional Integration Agreement aimed at development of a regional body, the Andean Common Market (ANCOM), representing six Latin American nations.
40. No less than 39 specific offenses are listed as well as an general clause prohibiting those practices imposed as conditions for obtaining required technology which would have an adverse effect on the recipient enterprise. Per se illegal practices include: tie-ins, restrictions on recipients' volume and scope of production, export prohibitions, grant-backs to the proprietor of inventions by the licensee, and limitations exceeding the scope of the licensed industrial property right. See Goldscheider, Assessment and Contractual Arrangements of the Acquisition of Foreign Technology by Developing Countries, Current Trends in Domestic and International Licensing, 490-1 (1976).
41. Conboy, *supra* note 12, at 78.
42. Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction, adopted by a vote of 108-0 with 14 abstentions. G.A. Res. 2749 (XXV), 25 U.N. GAOR Supp. (No. 28) 24, U.N. Doc. A/8028 (1970) (hereinafter cited as 1970 Declaration of Principles).
43. See generally, Van Dyke and Yuen, "Common Heritage" v. "Freedom of the High Seas": Which Governs the Seabed? 19 San Diego L. Rev. 493 (1982). [also published in E. Miles and S. Allen (eds.), The Law of the Sea and Ocean Development Issues in the Pacific Basin 206 (1983)].
44. Comment of Congressman Breaux in Legatski, Law of the Sea: Are American Interests Being Sacrificed to Achieve a Treaty?, 15 Ocean Industry 21, 22 (Apr. 1980).
45. Charney, United States' Interests in a Convention on the Law of the Sea: The Case for Continued Efforts, 11 Vand. J. Transnt'l L. 39, 40 (1978).
46. Convention on the High Sea, 13 U.S.T. 2312, T.I.A.S. No. 5200, 450 U.N.T.S. 82, Done Apr. 29, 1958; Convention on the Continental Shelf, 15 U.S.T. 471, T.I.A.S. No. 5578, 499 U.N.T.S. (1958); Convention on Territorial Seas and Contiguous Zone, 15 U.S.T. 1606, T.I.A.S. No. 5639 (1958); Convention on Fishing and Conservation of Living Resources of the High Seas, 559 U.N.T.S. 286, Done Apr. 29, 1958.
47. See Van Dyke and Yuen, *supra* note 43, at 501-8.
48. U.N. Doc. A/6695 (1969). This was not the first use of such a concept. A 1959 United Nations Resolution urged the use of outer space, for instance, for the "common interest of mankind as a whole." G.A. Res. 1472 (XIV) (1959).

49. See Van Dyke and Yuen, *supra* note 43, at 521-30.
50. 1970 Declaration of Principles, *supra* note 42. (emphasis added)
51. The International Seabed Authority (ISA), governing body in the area, comprised of an Assembly, Council and Secretariat; see Part XI, Section 5, Articles 156-185 of the Convention of the Third U.N. Conference on the Law of the Sea, U.N. Doc. A/CONF. 62/W.P. 10/Rev 3 (1980) (hereinafter UNCLOS III Convention).
52. Charney, *supra* note 45, at 59.
53. Convention on the Law of the Sea, art. 266.
54. *Id.*, art. 268.
55. *Id.*, art. 269.
56. *Id.*, art. 274.
57. *Id.*, art. 275, 276.
58. *Id.*, art. 267 (emphasis added).
59. See, e.g., Breaux *supra* note 18, at 22.
60. Convention on the Law of the Sea, art. 144.
61. Breaux, *supra* note 18, at 21-2.
62. *Id.*
63. Convention on the Law of the Sea, Annex III. See, in particular, Article 5.
64. *Id.*, art. 170. The Enterprise is the Authority's operating arm.
65. *Id.*, art. 153.
66. *Id.*, Annex III, art. 3-5.
67. Informal Working Paper, IA/1 at 1 (informal working paper of U.S. Delegation to UNCLOS III dealing with proposal for protection of preliminary investments, Apr. 2, 1980).
68. Donkers, Equipment for Offshore Mining, 2 Marine Mining 213 (1980).
69. *Id.* at 225.
70. *Id.* at 227.
71. See Van den Kroonenberg, A Novel Vertical Underwater Lifting System for Manganese Nodules Using a Capsule Pipeline, Offshore Technology Conference 1979 Proceedings, OTC 1979 Paper No. OTC 3365, at 59.
72. The four consortia that have been in existence for the longest period of time are:
 1. Kennecott Consortium;
 2. Ocean Management Inc. (OMI);
 3. Ocean Mining Association (OMA); and
 4. Ocean Minerals Co. (OMC).

See Deep Seabed Mining and Law of the Sea, Hearings before the Subcommittee on International Organizations of the Committee on International Relations, House of Representatives, 95th Congress 1st Session, May 17 and 18, 1977, at 15-17 (hereinafter referring to as Subcommittee Hearings). A French Consortium (Association Francaise pour l'etude et la recherche des nodules -- AFERNOD) and a Japanese group (Deep Ocean Minerals Association -- DOMA) are now also involved.

The Kennecott group is 50% Kennecott-owned and draws significantly upon Kennecott's prior mining experience from copper activities. The basic device in contemplation for extraction involves use of a single towed mining head with an in-line pumping system. Arthur D. Little, Inc., Technological and Economic Assessment of Manganese Nodule Mining and Processing, 25 (Study Prepared for U.S. Department of the Interior, Office of Minerals Policy and Research Analysis, Nov. 1979); Subcommittee Hearings, supra, at 15.

Their exact processing system has not been publicly identified, but the group is apparently leaning toward an ammonia-based cuprous ion metal extraction process.

OMI is a truly international consortium; investors from Canada, West Germany, Japan and the United States each hold a 25% stake in its operations, each party having extensive experience in the area. Sedco, the main member of the group, is a longtime ocean industries company. The basic technology being considered here is use of two separate towed mining systems. OMI's processing system is presently expected to be capable of yielding a ferro-manganese product. Subcommittee Hearings, supra, at 16.

Another major U.S. concern, U.S. Steel, is a one-third owner of OMA, along with Sun Oil and a Belgian concern. Although having no prior experience themselves, these three have arranged for a service contract with Deepsea Ventures, the group that unsuccessfully attempted to lay a claim in 1974 to a seabed site, a claim subsequently rejected. See Note, Deepsea Ventures: Exclusive Mining Rights to the Seabed as a Freedom of the Sea, 28 Baylor L. Rev. 170 (1976). OMA's technology employs a towed mining head and an air lift pumping process. Subcommittee Hearings, supra, at 16.

The fourth major consortium -- OMC -- is primarily a Lockheed Missiles and Space Cogroup. OMC has the advantage of considerable experience in research and testing with submersibles and deep water oil production systems. *Id.* The company's research has been directed predominantly at nodule recovery equipment, with proportionately little exploration having been done by the end of the 1970's. *Id.* at 17.

73. Subcommittee Hearings, supra note 72, at 17.

74. *Id.* at 8. In 1978 an estimate of \$700 million was made. A figure of at least 40% more (accounting for a minimum of 10% increase in inflation for each of four years) is no doubt more reliable for 1982 cost estimation. The new estimate, therefore, would be \$980 million.

75. Declaration of Principles, supra note 42, paras. 1 and 7.

76. Prospecting is to be encouraged (Convention on the Law of the Sea, Annex III, art. 2(1) (a)), but can be conducted only after the International Seabed Authority has been notified by the prospective prospector of its intent to abide by the rules of the Convention and of the broad area to be prospected. *Id.*, Annex III, art. 2(1) (b). Prospecting by more than one prospector in an area is allowed. *Id.*, Annex III, art. 2 (1)(a). Even though a "reasonable" amount of resources may be recovered by the prospector for sampling, prospecting confers no preferential, proprietary, exclusive or other rights on the prospector with respect to the resources. *Id.*, Annex III, art. 2(2). The prospecting applicant apparently must cooperate in allowing the Enterprise staff or developing State nationals to "participate" in the prospecting in order to increase their technological bases. *Id.*, art. 144(2) (b), incorporated by reference into Annex III, art. 2(1)(b).
77. Before a party can explore or exploit it must obtain Inter-Seabed Authority approval of a plan of work covering its activities in the Area. Parties may apply for any part of the seabed, except for previously reserved sites, which are established under Annex III, Articles 8-9. All applications must cover an area of sufficient size to support two commercial mining operations. The territory is divided into two zones of equal commercial value by the applicant. The Authority has 45 days in which to designate one of the two halves a "reserved site" to be used solely by the Authority, which may operate either through the Enterprise or in a cooperative venture with one or more developing States Parties. The zone chosen will be designated reserved upon approval of the plan or work on the non-reserved site by the applicant. *Id.*, Annex III, art. 8. In the event the Enterprise does not mine its site, it shall consider plans of work submitted by developing States to carry out activities on the site. *Id.*, Annex III, art. 9.
78. *Id.*, Annex III, art. 7(3) (a-c).
79. Draft Resolution II, para 1(e) in U.N. Doc. A/CONF. 62/L. 132/Add. 1 at Annex IV (April 22, 1982) [hereinafter referred to as PIP Resolution].
80. It is improbable that Japan, India or the Soviet Union will begin commercial production in this decade. They each hope to begin, however, no later than 1995. This lag is one reason the Japanese fought to limit the mining area of a pioneer site to 23,400 square miles, whereas the Western nations wanted to explore 60,000 square mile tracts. The final approved area was 150,000 square kilometres.
81. PIP Resolution, *supra* note 79, para. 1(a).
82. *Id.*, para. 8(c).
83. *Id.*, para. 14.
84. "Sea-Law Treaty Adopted, 130-4, Over U.S. Opposition," L.A. Times, May 1, 1982, at 1, col. 1 and at 19, col. 1. For an

- insight into the predisposition of Mr. Malone and the U.S. Delegation during negotiations, *see* Testimony of James L. Malone before the U.S. Senate Subcommittee on Arms Control, Oceans, International Operations, and Environment, Senate Foreign Relations Committee, June 4, 1981, at 4-7.
85. Convention on the Law of the Sea, Annex III, art. 5(1).
 86. *Id.*, Annex III, art. 5(2).
 87. *Id.*, Annex III, art. 3(5).
 88. *Id.*, Annex III, art. 5(3)(a).
 89. *Id.*
 90. Breaux, *supra* note 18, at 22.
 91. Convention on the Law of the Sea, Annex III, art. 5(3)(a).
 92. U.S. Delegation Report, Resumed Ninth Session of the Third U.N.C.L.O.S., July 28-Aug. 29, 1980 (Geneva), at 8.
 93. Convention on the Law of the Sea, Annex III, art. 5(3)(a).
 94. *Id.*, Annex III, art. 5(3)(a).
 95. U.N. Press Release, SEA/422, at 13 (Sept. 2, 1980).
 96. Convention on the Law of the Sea, Annex III, art. 5(4), and U.N. Press Release, SEA/422 at 13, Sept. 2, 1980.
 97. 1980 U.S. Delegation Report, *supra* note 92, at 9.
 98. Convention on the Law of the Sea, Annex III, art. 5(4).
 99. *Id.*, Annex III, art. 5(3)(b).
 100. *Id.*
 101. *Id.*, Annex III, art. 5(3)(c).
 102. U.S. Delegation Report, *supra* note 92.
 103. Convention on the Law of the Sea, Annex III, art. 5(3)(c).
 104. *Id.*
 105. *Id.*
 106. *Id.*, Annex III, art. 5(3)(d).
 107. *Id.*, Annex III, art. 5(3)(e).
 108. *Id.*
 109. *Id.*
 110. *Id.*, Annex III, art. 5(5).
 111. *Id.*
 112. 1980 U.N. Press Release, *supra* note 95, at 14.
 113. Convention on the Law of the Sea, Annex III, art. 6.
 114. *Id.*, Annex III, art. 11.
 115. *Id.*, Annex III, art. 7.
 116. 1980 U.S. Delegation Report, *supra* note 92, at 9.
 117. Convention on the Law of the Sea, art. 155.
 118. *Id.*, Annex III, art. 5(8).
 119. *Id.*
 120. Convention on the Law of the Sea, Annex III, art. 15. *See also* art. 144(2).
 121. *Id.*, Annex III, art. 14(1).
 122. *Id.*, Annex III, art. 14(2).
 123. *Id.*, Annex III, art. 14(3).
 124. *Id.*, Annex III, art. 14(4), and art. 168(2).
 125. *Id.*, Annex III, art. 13.
 126. As compared to the more traditional view of international law known as *pacta sunt servanda* (contracts or promises are binding as made).
 127. Convention on the Law of the Sea, Annex III, art. 19.

28. *Id.*, art. 20.
29. *Id.*
30. *Id.*, Annex III, art. 18(1) and (2).
31. *Id.*, art. 162(2)(v).
32. *Id.*, Annex III, art. 18(3). See also section 6 of PART XI.
33. *Id.*, art. 16.
34. 1980 U.N. Press Release, *supra* note 95, at 15.
35. See Informal Working Paper, IA/1, 2 April 1980 (Informal working paper of U.S. Delegation to UNCLOS III dealing with proposal for protection of preliminary investments).
36. Statement of President Reagan on the Law of the Sea (Jan. 29, 1982); U.S. Law-of-the-Sea Delegation, Approaches to Major Problems in Part XI of the Draft Convention on the Law of the Sea 22-27 (Feb. 24, 1982) [hereinafter cited as 1982 U.S. Approaches].
37. U.N. Doc. A/CONF. 62/L. 132 (April 27, 1982); U.N. Doc. A/CONF. 62/L. 141 (April 29, 1982).
38. See Van Dyke and Yuen, *supra* note 43, at 547-49.
39. 1982 U.S. Approaches, *supra* note 136, at 22-27; Speech by U.S. Ambassador James L. Malone, Berkeley, California, Feb. 20, 1982.
40. 1970 Declaration of Principles, *supra* note 42; see Van Dyke and Yuen, *supra* note 43, at 521-34.

COMMENTARY

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The role of technology and of technology transfer in developmental strategy is complex and controversial. The two papers we have just heard are really excellent. I am grateful to have had the opportunity to read them, because they make an important contribution and will be extremely useful both to transferors and transferees.

Surprisingly, some people still look at technology transfer as if it were really an issue that does not exist. At UNCLOS III some of the negotiators, especially the U.S. negotiators, tended to say, "Well, all you have to have is some money, and then you can buy it." At the other end of the spectrum we have the view -- and I think we heard it here today -- that technology transfer really embraces the whole social system, including education and training.

Again, some people look at technology as if it were an autonomous force, a primary cause in the development process, while others, following the French school of Jacques Ellul, regard technology as some incorporation of evil, as the new form of the devil that is going to wreck our society. Still others view technology as playing an important but secondary role, second to the political order which is seen as determining technological development and transfer, and the uses to which technology is put. I myself belong to this last school.

I would like to say a few words about the particular importance of ocean mining technology in the context of what now is generally called the third industrial revolution. Recently at the Versailles Summit, President Mitterand of France made what I think was the best of a series of statements, which Prime Minister Trudeau defined so merrily as weasel words. I think the Mitterand statement was very important. He listed ocean exploration technology as one of the high technology areas, along with space technology, biotechnology, electronics, non-conventional energy technology, and others, which make up this third industrial revolution. It is in these areas of new technologies that he proposes the launching of a concerted program by establishing international commissions for research and development and for technological cooperation between public and private firms and states. This is a very important suggestion.

In this same proposal Mitterand also stressed the importance of the participation of developing countries in joint ventures (initiatives co-joints) to assure the countries of the South (as he put it) the acquisition of these new technologies, which would be greatly facilitated by agreements on co-development or common research in development. I would like to return to this at the end of my comments, because it is immensely important, but the point I wish to make is that if the

developing countries do not join this third industrial revolution now, at the ground floor, at the level of research and development, the development gap 20 years from now may be too wide to bridge.

What about technology itself as part of the common heritage of mankind? It seems to me that if we declare a resource to be a common heritage, then the technology that is needed to utilize that resource must also be common heritage. The link between resources and technologies is unbreakable. Resources are what technologies make of them.

This should have been obvious to the US negotiators at UNCLOS III who kept insisting that the resource in situ has absolutely no monetary value, and that it is only the technology that gives it value. Yet, we know it was the U.S. in particular that resisted the concept that technology too should be considered common heritage. This concept does not, of course, mean that we must decapitate all the present owners of technologies or that we want to expropriate them. No, but it does mean that we should create systems whereby technologies can be developed jointly with the public sector and at the international level along the lines suggested by Mitterand.

Let me come to the Convention itself. As was pointed out, we have three levels at which technology is being dealt with. One is that of mining. The second is the processing level. Both the first and second are covered in Part XI and Annex III. The third level is that of marine technologies in general, which is covered in Part XIV. It has been observed that the provisions regarding the mining technology are the most binding of the three, although even those provisions, in the final analysis, are not really binding. Last year's chairman of the International Law Commission, Ambassador Christopher Pinto of Sri Lanka, has recently pointed out that a close reading shows that even there the technology provisions are not binding; that no court would describe them as mandatory or enforceable.

As Jon Van Dyke has noted, a worst case hypothesis has been used by some of the industrialized countries in order to bolster their objections and suspicions. But there is also a worst case hypothesis for developing countries that if they tried to enforce these provisions they would find them unenforceable. When we come to processing, of course, we find the transfer provisions are even looser. There is nothing in the Convention that really makes these provisions enforceable. And when we come to the general marine technology part, we are in the realm of exhortatory or soft law.

What is the reason for these differences in the language of the Convention? It has been attributed to oversight on the part of the developing countries, but I would like to offer an alternative explanation. The Convention is, of course, based on the awareness that all problems of the ocean are interdependent. In this sense the Convention on the Law of the Sea is a constitution for the oceans. But in matters of institutional infrastructure, constitution-building is limited to the area of deep ocean mining. For other uses of the sea, the Convention

assigns management functions to the "competent international organizations." Recently, I made it my sport to count these references to the "competent international organizations." There are 62 such references in the text. But they remain at that level.

In spelling out provisions for technology transfer, you need an institutional infrastructure. That, to my mind, is the reason we have this relative precision in Part XI, dealing with institutional infrastructure, and this vagueness, this exhortatory language, in other parts of the Convention which do not create institutional infrastructure. Yet, I do not believe that in these other parts the Convention has triggered developments which will proceed, no matter whether the Convention is generally ratified, as we hope.

Now the evolution of "competent international organizations" is in full course. These agencies are now re-examining their terms of reference, to see how far they have to restructure and strengthen themselves so as to be able to implement the Convention. I would expect that in this process stronger, more effective, binding provisions for technology transfer will be framed.

In conclusion, let me return to President Mitterand's proposal and suggest further that we should set up as speedily as possible, through the Preparatory Commission, a research and development joint venture on deep ocean explorations. I think this would be extremely useful, both for developed and developing countries: for developed countries, because it would save them money by reducing investments and spreading the risks; for developing countries, because it would be a short-cut into high technologies management.

The Resolutions on preparatory investment protection and the establishment of a preparatory commission open up unexpected horizons. Perhaps some of you have not thought of these Resolutions in that way, but perhaps this is the counter-intuitive result of these initiatives. The first aspect of this new situation is the recognition of what kind of activities will be taking place on the seabed in the immediate, foreseeable future. They will not be mining activities. We shall not see the kind of integrated operation envisaged in such lavish detail in the Convention until the end of the century. Activities in the International Area in the immediate future will be exploration and research and development activities. That is a very different scenario.

The second aspect of the new situation is that the PIP Resolution gives the Preparatory Commission powers it would not otherwise have. It has to deal with contracts for exploration and for research and development. It has to select reserved sites for the Authority. It has to make arrangements for technology transfer and the training of personnel from developing countries. It has to have operational capabilities which we did not think it would have a year ago or so.

Third, the Preparatory Commission has a flexibility now that the Authority itself does not have. This flexibility will

help the Commission in its effort to adjust the ideas of the 1970s to the realities of the '80s and '90s.

Finally, the Resolutions create an effective interim regime, which can go into effect as early as 1983, upon 50 signatures of the Convention, which we are certain to get. We don't have to wait until we have 60 ratifications, which may take very much longer -- or which we may not get at all, although it is very much hoped we shall.

The paradox is that the PIP Resolution, which we thought was a tragic concession that we would have to make to save the Convention, turns out, in conjunction with the Prep. Com. Resolution, to give us the possibility of establishing immediately an effective regime for exploration, research and development, flexible enough to permit constructive action -- with the full participation of developing countries -- with regard to technology transfer, or the co-development of technology, in the immediate future.

RECENT INITIATIVES IN MARINE DEVELOPMENT IN THE UNITED NATIONS

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In discussing initiatives taken or to be taken by the United Nations in marine development, it is useful to analyze the role of international public institutions in the broader context of development initiatives. Three major trends that characterize the current thoughts on development issues have direct relevance for the role of the United Nations.

First, in the western world, increasing emphasis is being put on the role of market forces in development issues. The arguments sometimes even go so far as to imply that market forces alone are necessary, sufficient and desirable for ensuring development. Examples of this are evident in some of the pronouncements in the North-South Meeting in Cancun and in the specific case of marine development, in the "green book of amendments" and its companion entitled "Approaches to Major Problems in Part XI of the Draft Convention on the Law of the Sea", circulated during the last session of the Third United Nations Conference on the Law of the Sea. As market forces are considered to be capable of taking care of socio-economic development issues, withering of the government or similar public institutions that are viewed as interfering with market forces is prescribed as a necessary condition for development.

Second, even if the public institutions do have a place in development issues, the role of international public institutions can be minimized by a shift towards bilateral or multilateral arrangements. This is evidenced, in our specific case of marine development, in the efforts to arrive at a "mini-treaty" or a Reciprocal State Agreement in relation to sea-bed mineral development. The other strand of this trend is the effort to upgrade those international public institutions where decision-making or voting mirrors, more or less, voting in the market place, i.e. by dollars. The preference for the roles of the World Bank and the IMF in development issues shown by some participants of the Cancun meeting is an example of this.

Third, the prolonged "stagflation" in the developed world, which is the major source of resources for the United Nations, is also having effects on the availability of resources at the disposal of the United Nations for development initiatives.

THE UNITED NATIONS AND MARKET THEORY

With the comeback of the free market approach in the area of development, it is worthwhile to examine the role of the United Nations vis-a-vis the market. It can be argued that the UN role complements rather than contradicts market forces, that

the UN activities attempt to correct the imperfections in the market so that the latter can operate freely.

First, it is well-known that market forces, left on their own, are incapable of achieving efficient production and distribution of public goods and goods characterized by externalities. Not to speak of the broader areas of world order and peace, if one considers the resources of the International Area, marine pollution control, marine scientific research, and the establishment of infrastructure for marine development, it is evident that even these cases fall into the category of public goods or goods characterized by externalities. In other words, the social and the private rates of return and the national and the international rates of return differ in these sectors. The United Nations' efforts in aligning the differing rates of return can be viewed as facilitating the operation of market forces.

Second, markets are often -- some would argue almost always -- characterized by imperfections which are impediments to achieving optimum outcomes. One can cite numerous examples in the marine field: oligopolistic market organization in the marine mineral and fuel resources, barriers in factor movement, especially capital and management, and in marine resource development, myopic investment and consumption decisions, lack of information about marine resource occurrence, and so forth. The United Nations activities in information, research, advice and assistance to member states can all be viewed in this context as measures to correct these market imperfections and thereby facilitate the operation of market forces.

Finally, one fundamental issue which is pointed out with impeccable intellectual integrity by the free market theoreticians, but which for some strange reason tends to be totally ignored by the practitioners, is that the free market system can achieve socially optimum outcomes if, and only if, the system initially starts with a socially optimum distribution of income. The so-called Pareto optimality is, then, achieved through voting by dollars in the market place. Given the inequality in income distribution among nations in the current world economic order, some mechanism has to be found to correct the distortion in voting in the market. The decision-making mechanism at UNCLOS III which operated on the basis of consensus -- and, when all efforts to achieve consensus failed on the basis of a specified majority under a one-nation-one-vote system -- can be viewed as such a corrective measure facilitating the operation of the free market system.

Viewed in this framework, the initiatives in marine development in the United Nations system may be said to be facilitating, rather than impeding, the operation of market forces. It is axiomatic for those who work within the United Nations system, but needs to be reiterated, that the Secretariats of these organizations have very little leeway in taking initiatives in any field, that the initiatives basically have to follow legislative mandates coming from the governing bodies composed of the representatives of the member states. It

is true that there is room for initiatives within the framework of the legislative mandates, but the broad mandates themselves have to be offered by the member states.

U.N. INITIATIVES ARISING FROM UNCLOS III

General

The activities of the United Nations system in marine development are numerous and varied. The system is composed of various organizations, each focusing on a particular sector or facet of development under its general mandate. There is no single organization which alone deals with marine development; marine development activities are carried out within a network of various organizations. Of course, there are coordinating mechanisms which oversee the network and ensure complementarity and effectiveness.

Marine development, being a cross-sectoral and multidisciplinary exercise, is being dealt with, in one form or another, by most of these organizations within the UN system. For example, the United Nations Conference on Trade and Development (UNCTAD) deals with the economic, commercial, technological and legal aspects of ocean shipping and ports. The UNCTAD in the past has made studies on the economic implications of the future exploitation of sea-bed minerals. The United Nations Development Programme (UNDP) is involved in the preparation and funding of international fisheries and marine resources development projects. The United Nations Environment Programme (UNEP) has given priority to the development of plans of action for the protection of regional bodies of water. The United Nations Industrial Development Organization (UNIDO) deals with processing, packaging and preservation of marine products, shipbuilding and related engineering aspects. Among the Specialized Agencies, the Food and Agriculture Organization's (FAO) work on ocean fishery is extensive. The United Nations Educational, Scientific and Cultural Organization (UNESCO), through its Division of Marine Sciences, focuses on the development of marine science programmes and marine scientific infrastructure for member countries as well as supports certain regional marine research activities. The purpose of the Intergovernmental Oceanographic Commission (IOC) is to promote scientific investigation with a view to learning more about the nature and resources of the oceans through the concerted action of its members. The World Health Organization (WHO) is concerned with health hazards of pollution in coastal waters. The World Meteorological Organization (WMO) carries out scientific observational activities on a world-wide scale for the preparation of weather analyses and weather forecasts, including warnings for storms and cyclones. The International Maritime Organization (IMO) deals with safety aspects of ships and their construction and equipment including those used in exploration and exploitation of ocean resources. Activities of the International Atomic

Energy Agency (IAEA) include management of radioactive wastes, study of marine radioactivity, desalination and irradiation of fishery products. The International Labour Organization (ILO) is concerned with the problems of seafarers and labour conditions in the marine environment.

Recent Legislative Developments

The prime movers in the recent initiatives in marine development in the United Nations system are four recent legislative developments:

- * the Convention on the Law of the Sea and the tasks for the United Nations organizations specifically mentioned in the Convention;
- * the tasks for the United Nations organizations implied in the Convention;
- * the Resolutions attached to the Convention; and
- * the Resolution on development of national marine science, technology and ocean service infrastructures adopted by the Conference on the Law of the Sea at the 181st meeting on 30 April 1982.

These legislative mandates refrain from assigning tasks to individual organizations in the UN system, perhaps as a deliberate measure. Some of the organizations, particularly because of their experience in the formulation of treaties, anticipated these legislative developments and have already responded, or are in the process of responding, to them. The UN Secretariat, the FAO and the IMO can be mentioned as examples. Some others have carried out a thorough analysis of these legislative developments in terms of the initiatives they can take. Mention can also be made of the efforts of UNESCO and IOC in analyzing the Convention, article by article, with a view to identifying possible tasks to be carried out and initiatives to be taken in their fields of competence. Most of the organizations are in the process of identifying areas of new initiatives evolving from these legislative mandates. One crucial issue, of course, is how and to what extent the mandate-givers, who are also providers of resources to the United Nations system, match assignment of tasks with allocation of resources.

Obviously, with increased emphasis and expansion of tasks, the need for efficient allocation of tasks among the individual organizations of a multi-organization system becomes pronounced and as a corollary of this, the need for coordination is also greater. The UN system has already taken a major initiative in this connexion by starting the process of task-allocation through consultations. A Cross-Organizational Programme Analysis (COPA) on marine affairs is underway; bilateral and multilateral consultations among organizations are being carried out.

Whatever the distribution of tasks, a general identification of tasks and initiatives is an essential step. That step has been taken in the form of an analytical exercise entitled "Study on the future functions of the Secretary-General under the Draft Convention and on the needs of countries, especially developing countries, for information, advice and assistance under the new legal regime" (UN document A/CONF.62/L.76). The document identifies the functions of the Secretary-General, thereby of the United Nations, under six categories:

- * Functions with respect to the establishment of the limits of coastal State jurisdictions;
- * Depositary and related functions;
- * Administrative functions associated with the convening of meetings of states parties;
- * Servicing of meetings of States Parties;
- * Functions with regard to the settlement of disputes;
- * Reporting function, which has a broad scope and may necessarily involve information and research activities on marine development.

The needs of member states which, in turn, prompt initiatives in the United Nations system are listed under seven categories:

- * Legislation and regulation
- * Regulation by specific marine activity
- * Publication or notification
- * Surveillance and enforcement
- * Administration and organization
- * Co-operation directly with other States or through international organization
- * Scientific and technical capabilities

The above mentioned study focused on the Convention itself to identify areas where the United Nations system can take initiatives in the marine field. A similar analysis needs to be done for the Resolutions attached to the Convention, especially Resolution I dealing with the Preparatory Commission and Resolution II dealing with the treatment of preparatory investments.

Three paragraphs of Resolutions I and II expressly assign certain functions to the Secretary-General of the United Nations: paragraphs 1, 15, and 16. These functions are described under the following categories:

- (a) Convening of the Preparatory Commission for the International Sea-Bed Authority and the International Tribunal for the Law of the Sea (Resolution I, para. 1). This includes the depositary function with respect to signatures and instruments of accession, determination of the date for convening and notification of states,

determination of the composition of the Commission between states which have signed the Convention or acceded to it, and signatories of the Final Act, consultation/arrangements with the government of the state in whose territory the Commission shall meet, and consultations on whether facilities are available.

- (b) Making available to the Preparatory Commission such Secretariat services as may be required (Resolution I, para. 15).
- (c) Bringing Resolution I, in particular paragraphs dealing with the expenses of the Preparatory Commission and with the Secretariat services as may be required by the Preparatory Commission, to the attention of the General Assembly for necessary action (Resolution I, para. 16).

A clear idea of the third category of functions of the Secretary-General mentioned above, namely making available to the Preparatory Commission such Secretariat services as may be required, can be obtained from a careful analysis of the powers, functions and tasks entrusted to the Preparatory Commission itself. In addition to the usual functions of a body carrying out preparatory work for the establishment of an international organization, the Preparatory Commission for the International Sea-Bed Authority and the International Tribunal for the Law of the Sea shall have some special functions. These special functions arise because the Preparatory Commission will not just carry out preparatory work for the establishment of an institution. It will also do preparatory work for the establishment of a regime for resource exploration and exploitation.

The special functions and tasks of the Preparatory Commission can broadly be classified as follows:

- (a) Preparation of such draft rules, regulations and procedures as the Preparatory Commission deems necessary to enable the Authority to commence its functions (Resolution I, para.5 (g)). These draft rules, regulations and procedures, following article 17 of Annex III, may be on matters such as administrative procedures relating to prospecting, exploration and exploitation in the Area: (mining) operations, including size of area (for minesites), duration of (mining) operations, performance requirements (for mining operations), progress report (of operations), submission of data (related to operations), inspection and supervision of operations, mining standards and practices; financial matters, including establishment of uniform and non-discriminatory costing and accounting rules, attribution of net proceeds to mining, incentives to further specified objectives.
- (b) Functions assigned to the Preparatory Commission with regard to the treatment of preparatory investments under Draft Resolution II (Resolution I, para.5 (h)). Following Resolution II these functions will include:

- (i) Making recommendations for the early entry into effective operation of the Enterprise (preamble paragraph);
 - (ii) registering a pioneer investor and allocating to it the pioneer area (paras. 2 and 3.). This, in turn, will involve assessment whether all data required (e.g., information relating to mapping, sampling, the density of nodules and the composition of metals in them) have been submitted to the Preparatory Commission;
 - (iii) receiving information about any efforts to resolve conflicts with respect to overlapping claims on areas in respect of which applications are made for registration as a pioneer investor (para.5 (a));
 - (iv) receiving payment of a fee of \$US 250,000 from every applicant for registration as a pioneer investor (para.7 (a));
 - (v) certifying the pioneer investor of compliance with the provisions of Draft Resolution II (paras.8 (a), 11 (a))
 - (vi) incorporating in its final report details of all registrations of pioneer investors and allocation of pioneer areas (para.11 (b)).
- (c) Undertaking studies on the problems which would be encountered by developing land-based producers likely to be most seriously affected by the production in the Area with a view to minimizing their difficulties and helping them to make the necessary economic adjustment, including the establishment of a compensation fund, and submitting recommendations to the Authority thereon (Draft Resolution I, para.5 (1)).
- (d) Establishing a special commission for the Enterprise and entrusting to it, inter alia, the following functions:
- (i) Requesting registered pioneer investors to carry out exploration in the area reserved for the conduct of activities by the Authority through the Enterprise or in association with developing States, on a cost-reimbursable basis (para.12 (a) (1)). This, in turn, may involve entering into an exploration contract with the registered pioneer investor;
 - (ii) designating personnel for training by the registered pioneer investor (Para.12 (a) (1)).

It can be seen that the Preparatory Commission is entrusted with a variety of functions, most of them of a highly technical nature. The substantive Secretariat services required will involve collection and assessment of information and data, as well as research and analysis of scientific, technological, operational, financial and economic aspects of sea-bed resource development and management. They may also include promotion of specialized expertise through training, for example, and negotiation of contracts. The Secretary-General may be called on to make available any of these services.

SOME RECENT UN SECRETARIAT INITIATIVES

As mentioned earlier, the United Nations has already taken new initiatives in marine development with a view to responding to the recent legislative mandates. I would like to conclude by mentioning some of these efforts by the United Nations Headquarters.

It is well-recognized and further emphasized in the Preamble of the Convention that the issues of marine development are closely interrelated and need to be considered as a whole. The primary responsibility for the development and management of most of the existing exploitable resources and uses of the oceans falls or will fall on each coastal state. Nonetheless, because certain management problems and needs associated with the utilization of extended resource jurisdiction cut across such jurisdictions owing to the geographical proximity of states, particularly within marine regions, or to the nature of the problem, coastal states will inevitably find it useful to pursue regional cooperation in management. Studies are being initiated regarding the desirability and feasibility of ocean management programmes at the national level and potentials of co-operation in ocean management at the regional level. Emphasis will be placed in identifying the essential elements of such programmes and the appropriate scope of such programmes for developing coastal states. This is closely connected with the marine dimension in development, i.e., harnessing the existing and potential contribution of the resources within, and the uses of, the marine area to national development planning. The extent to which a nation seeks to incorporate marine resources and uses into its development process depends upon a number of factors, among them: the marine resources and space to which it has access, its priorities vis-a-vis viable alternatives and its capabilities in terms of technology, human resources and finance. The studies on ocean management, thus, will pinpoint the possibilities and constraints.

Ocean management can be conceptually divided into coastal zone management and exclusive economic zone (EEZ) management. As part of ocean management, and as an extension of the work of the United Nations in coastal zone management, programmes are being developed on EEZ management. The first initiative is the preparation of a comprehensive conceptual study and formulation of guidelines. The need at this stage is for information, for creating awareness of and familiarity with concepts and problems and activities associated with an integrated approach to EEZ development and management. Studies dealing with techniques, methodologies, experiences and conditions for EEZ development and management are being initiated. As part of preparing the EEZ management guidelines, appropriate institutional arrangements for EEZ development and management will be dealt with. Preparation for a group of experts meeting on institutional arrangements to be held in January, 1983 are under way.

In addition to this emphasis on over-all planning and management of marine resource development, the UN Headquarters is taking initiatives in redeploying its long-standing expertise in marine minerals with a view to responding directly to the recent legislative mandates. Recognizing that information and research activities on sea-bed mineral development have been concentrated in few countries and perceiving the need for synthesis of information and research results and dissemination of the synthesized conclusions among the international community, a series of nine monographs are being prepared. These monographs will systematically deal with resource assessment, technologies for exploring, mining and processing manganese nodules, methodologies for mine site delineation, methodologies for processing site selection, financial structure of a nodule mining venture, comparative costs of land-based and sea-bed mining, regulatory framework and finally, the activities of entities involved in manganese nodule resource development.

Data on manganese nodules are essential for facilitating the work of the Preparatory Commission as well as for assessing the potentials in different sea areas. The most comprehensive, world-wide public data bank is being transferred to the United Nations and by early 1983 the United Nations will be the sole operator of the data bank. Plans are being studied to expand the data bank to include polymetallic sulphides, metal-containing muds and mineral in the EEZ. At present, the public data bank has glaring gaps in terms of sea areas covered. Possibilities of filling those gaps through an internationally organized scientific cruise are being studied.

Regarding near-shore minerals, a crucial problem is the lack of readily available, standardized data on nearshore hard mineral occurrences. Work has begun on a project aimed at constructing a uniform reporting system for nearshore hard mineral occurrences and at developing a computer programme for storing, recalling and cross-checking any reported data. A trial run of the programme is being carried out in the West African region. In the future, the programme will be applied to the Caribbean and ESCAP regions. The results of this project will facilitate more effective exploration and development work on the part of governments and national and international organizations in this field.

The pre-condition for marine development is the application of marine technology. Marine technology, in the current economic order, is concentrated in the hands of few nations. Transfer of marine technology is essential for the promotion of marine development. Recently, a workshop, which brought together producers and potential users of marine technology, has been held at Headquarters investigating the efficient ways and means of transaction of marine technology. Recognizing that the transaction may have a regional dimension, in the future several regional workshops will be held. Preparation for a regional workshop to be held in Madras, India is under way.

These are just a few examples of the recent initiatives in marine development and also these reflect the initiatives in the Headquarters only. The opportunities presented by the Convention on the Law of the Sea have spurred initiatives in other areas and can be a basis for the organizations in the UN system to take initiatives in numerous areas. In concluding, it should be re-emphasized that these initiatives can be viewed as complementing, rather than contradicting, the operations of market forces.

PARTNERSHIPS IN HYDROCARBON DEVELOPMENT: THE ROLE OF
PETRO-CANADA INTERNATIONAL ASSISTANCE CORPORATION

Georges Leger
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You may recall the title of a remarkable article written a couple of years ago by Elizabeth Mann Borgese, "Boom, Doom and Gloom over the Oceans". With the recent conclusion of UNCLLOS III some of the gloom can be said to have been dissipated, and doom may have been postponed. But a large number of the world's poorest coastal nations may be wondering when the predicted boom in their resource development will occur.

Progress in the law of the sea and major shifts in the global order of the oceans have transferred to coastal states extensive and exclusive rights over their resource-rich continental shelves. It is in these offshore areas that most of the oil-poor developing countries hope to find new oil and gas discoveries which will reduce their dependence on imported oil. Geologists are confident that a large portion -- perhaps as much as 20% -- of the yet undiscovered potential reserves of oil and gas exists in these developing countries. Yet still the drilling density in the U.S. alone is estimated to be 35 times higher than that of all oil-importing developing countries.

There are a number of factors which explain this paradox, not the least of which are the greater financial and fiscal incentives offered in major developed countries, in many cases even inducing oil companies to invest in secondary or tertiary recovery of oil from previously depleted wells. There are also disincentives to be found in many Third World countries: economic and political instability, the loss or scattering of existing geological data, and various institutional, fiscal or legislative impediments.

We, in Canada, are facing our own oil supply constraints, and through self-imposed discipline are striving to remove ourselves from the world oil market. As a member of the International Energy Agency, we are pledged to reduce consumption and increase supply through various levels of government intervention, as required. Our National Energy Program (NEP) is a basic expression of our commitment to self-sufficiency through a number of mechanisms.

In seeking this goal, we cannot and must not be lulled into complacency by temporary vagaries in supply on the world oil market and relatively low oil prices. Experience has shown that the only sure thing about oil price forecasting is what statisticians call the margin of error. In this case it would be more accurate to speak of the margin of probability. Given the existence of a finite and non-renewable resource; given the track record of western democracies in controlling their energy appetites unless faced with disaster; given Murphy's Law which may account for the fact that most of the world's available supply of oil is to be found in low energy-consumption areas;

and given the political turmoil in the Middle East, you may as well discard the model.

There was an element of the original NEP that went largely unnoticed at the time -- which is hardly surprising when seen in the context of other major policy decisions. It concerned the creation of a new subsidiary of Canada's national oil company, which has been registered as Petro-Canada International Assistance Corporation (commonly referred to as PCI). With an initial budget of \$250 million until 1985 from government aid funds, PCI, a child of NEP and Canada's North/South Initiatives, was baptized by Prime Minister Trudeau at the U.N. Energy Conference at Nairobi in the summer of 1981.

At that time, the fashion in the aid world was to seek to create energy affiliates in major aid agencies, and in particular at the World Bank. In typical Canadian style, we have turned the tables and created an aid affiliate to our national oil company. You will undoubtedly recognize the practical merits of this approach. First, it avoids the complexities and excessive bureaucracy which are unavoidable in larger aid agencies such as CIDA or the World Bank. PCI is lean on overhead, not having any personnel or administration of its own. It is streamlined in its procedures, having borrowed from its corporate parent, and been nurtured in the private sector and the oil patch. Second, it has built into it the resources, know-how and expertise of the national oil company. This includes the much-vaunted "window-on-industry" which for PCI translates into opportunities for the Canadian oil and gas industry in creating new markets and outlets in the developing countries.

PCI's mandate is clear-cut: to provide exploration and pre-exploration services for oil and gas in the oil-importing developing countries, to help them reduce or eliminate their dependence on imported oil. At present, these services are provided on a grant basis, although the advisability of adopting a graduated loan programme is under study. The goods and services to be provided are to be drawn from Canadian industry and domestic sources. The countries under consideration are among Canada's traditional aid partners.

A brief description of our initial projects, those approved so far for 1982, will illustrate the scope and nature of PCI activities abroad.

The Jamaican national oil company, PCJ, is keen to evaluate the island's geological potential, and hopeful to find an indigenous supply to offset Jamaica's staggering oil import bill at present for 100% of its petroleum requirements. A drilling programme has been initiated onshore with funding from the Inter-American Development Bank, and an exploratory seismic and drilling programme is being carried out offshore with some help from the World Bank. PCI will provide drilling management services onshore and will carry out an extensive marine seismic survey offshore to complement the work being funded by international financial institutions. We will also help train Jamaican personnel both on-the-job and within their own

corporate structure. A computerized economic analysis capability is being provided to help assess the proper mix of fiscal and legislative incentives to attract private industry at the production stage, should a commercially viable discovery be made. This is in keeping with PCI's basic philosophy of acting in every regard as a catalyst to private investment.

A project in Senegal over the next 18 months will provide \$18 million worth of exploration and technical assistance. This will include marine seismic surveys in offshore acreage relinquished by Chevron; aerial magnetic and seismic surveys onshore; and offshore drilling of any promising structures that may be determined in the area under study. The beneficiary of this aid project is Petrosen, their national oil company. There are also heavy oil shows, where Canadian expertise and technology may apply to reduce some of the uncertainties and increase the attractiveness of the acreage to potential investors. In these programmes PCI will coordinate with other aid donors, including the World Bank, the European Investment Bank, and NORAID, the Norwegian aid agency.

A third programme is for \$26 million of work in Tanzania, a country sorely pressed for help in meeting their oil import bill. PCI will drill an offshore well in acreage held by the Tanzanian Petroleum Development Corporation, and will do a sedimentary basin evaluation of an inland area near Lake Rukwa. The drilling will occur on a structure which has been assessed by NORAID, on Tanzania's behalf, as very promising.

Another project under preparation would result in a regional marine seismic evaluation of the offshore of several Caribbean countries, including possibly Haiti, the Dominican Republic, Jamaica, Barbados, the Windward and Leeward Islands, and Guyana. There is also a good possibility of an onshore project in Barbados, where current production is dwindling and cannot meet the island's needs.

The next area of operation will undoubtedly be in Asia, where PCI is doing project identification work in Bangladesh, Thailand and the Philippines.

As you can readily see, there is no lack of work in this field, and our budget will soon barely be sufficient to execute current programmes. Offshore drilling can cost as much as \$30 million a well in these countries, and you cannot fund too many such projects on \$100 million a year. PCI's mandate, however, allows the corporation to act as an executing agent for other aid agencies, such as CIDA, the World Bank or regional banks. It is our intention to consult with other national aid donors and oil companies, in countries such as Norway, Mexico or Venezuela and with aid funds such as those of OPEC, Saudi Arabia or Kuwait.

Canadian industries, especially the oil and gas and ocean industries, stand to benefit greatly from PCI's involvement; not only through primary contracts -- with companies providing geological and geophysical services such as seismic surveys and interpretation, aeromagnetic work, drilling services (including drill-ships) and equipment, and even with other oil companies

with integrated operations -- but even more important at later stages of exploration and production, when the recipient country may well prefer to continue to buy Canadian. This constitutes a definite opportunity threshold for industry.

For the oil-importing developing countries (OIC's) the benefits are obvious. Right now, they are enmeshed in a catch-22 situation. To fuel their economic development and to attempt to reduce disparity with the Western world, they have switched massively to oil from more traditional fuels such as wood or biomass. But many now find that a hydrocarbon-based economy is hardly possible to maintain, because at the current oil prices their economic infrastructure -- exports over imports, industrial output and efficiency -- is inadequate. On this extremely dangerous treadmill, some of the weakest of the OIC's are beginning to go backwards. Some people call this the high cost of being poor.

Oil has become an expensive habit and almost impossible to kick. The transition to dependable, abundant and hopefully renewable energy sources will not happen overnight. In the meantime, we, who have achieved a high level of productivity on artificially cheap energy, will have to pitch in and help poorer countries through this difficult period. The PCI programme is designed to give OIC's access to immediate services, know-how and equipment on a no-cost high-risk basis, without having to compromise their sovereign rights over their resource base or to hamper their economic growth.

So if the boom is still some time off, at least all is not doom and gloom. There's more than a glimmer of hope, if agencies such as PCI, working in coordination with the international financial institutions, can help to promote increased industry activity in OIC's. The discoveries to be made may not be in the category of those elephants the industry is constantly stalking for its worldwide operations, but it may be the rabbit in the hat that will turn the trick for the oil-poor Third World.

IMPLICATIONS OF THE NEW LAW OF THE SEA:
AN INTERNATIONAL DEVELOPMENT AGENCY PERSPECTIVE

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Cooperative Programs Unit
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Let me first set out a brief description of the agency which I represent -- the International Development Research Centre. This organization was created at the beginning of the 1970s by the Parliament of Canada and enjoys a rather singular status, that of an autonomous public corporation. We have been created by the Parliament of Canada, we continue to be financed by the Parliament of Canada but are independent of the policies of the Government of Canada. The policies of our Centre are set by an International Board of Governors of some twenty-one (21) members, drawn at present from eleven (11) different countries. IDRC, as it is commonly known, was set up as a result of the Pearson Commission Report to the United Nations of the late 60's, as an organization which would finance research in the developing world, conducted by the scientists and scholars of the developing world, on subjects of their own choosing. In choosing research projects to support, the Centre consistently looks for two features, the potential contributions of the research to national development and to the strengthening of the research capacity of the developing country groups involved. It has also been an important policy of the Centre to attempt to promote regional cooperation among the scientific and scholarly communities of the developing world.

Given the necessity to specialize imposed upon the Centre by the limits to its available resources during the first ten years of its existence, IDRC concentrated on financing activities related to agriculture and food, to aspects of health care, to information science and to certain aspects of the social sciences. All of these represent subjects which are a far cry from the day-to-day concerns of those who were concerned with the evolution of the new law of the sea.

The event which opened up the horizons of IDRC to new fields of activity was the declaration by the government of Canada at the 1979 United Nations Conference on Science and Technology for Development to the effect that Canada would finance an additional program in IDRC to promote cooperation between research groups in Canada and in the developing world. In financing such a program, no boundaries were set on the areas of activity which might be supported and so IDRC was faced with the prospect of being able to channel at least the resources of the Cooperative Program into areas which were new to the Centre. But even given this freedom, why should such a body with a long history in supporting such earth-bound activities as cropping systems research and the provision of rural sanitation systems turn to questions of the exploitation of the resources of the sea?

While I have sketched out the areas which have been of primary interest to IDRC, these have not been our exclusive interests and our legal counsel, for example, has followed the emergence of what is now called "development law" as it has evolved primarily within negotiations fostered within the United Nations system. So it should come as a surprise to no one that our legal staff were keenly interested in the long drawn-out negotiations concerning the law of the sea. In preparing for today's presentation, I asked my colleague, Mr. Inder Bhol, now IDRC's legal counsel, for a comment on developing country reactions to the agreement finally reached on the law of the sea. Let me quote what he said:

Reactions to the convention vary from irrepressible exuberance to total despair. It took almost three decades to write it; it abounds in generalities, and yet evades some issues of fundamental importance. It sets up a grand scheme, an institutional framework patterned after the United Nations bodies and comprised of an international seabed authority, with many organs under its wings including an Assembly, a Council, a Secretariat and an international tribunal for the Law of the Sea. Yet many people fear that the effectiveness of these organs may be impaired in practice by political policies of states, by the technological ascendancy of the developed countries which has outpaced legal development, and by the inadequacies of the policies, the technological status, the limited objectives and the piecemeal institutional structures of the developing countries. In short, the critics of the convention fear that the framework that it created will be a rerun of the United Nations, being manipulated by the powerful, at the expense of the majority of third world countries.

My colleague based these comments on his own experience as a long-time legal adviser to the government of a developing country.

In my discussions with him it seemed to us that, from the vantage point of a body like IDRC, there were two topics which are of primary importance to the developing world, both of which relate to the legal innovation of the establishment of exclusive economic zones. If the development of developing countries is to be based upon their sensible use of the resources of the territory over which they have control, the EEZs in many cases has significantly expanded that territory, albeit by extending it into environments where the control they can today exercise is more theoretical than practical.

The two pressing topics which need addressing, it appears to us, are first, the management and use of the EEZ, and second, the problem of regional cooperation.

If I may play a little with words as I try to characterize the importance of an EEZ to a developing state which has been

able to claim one, the EEZ represents a real expansion of that state's potential resource base, but in the absence of appropriate technology and appropriate administrative and political arrangements, the EEZ will remain simply a potential expansion of the state's real and utilized resource base.

For each of those countries, there is an undoubted desire and need to be able to manage and to exploit the living resources of the sea and the material resources of the seabed, and to ensure that the other multiple uses of the sea are compatible with that management system. All of this requires the possession of a detailed knowledge of the sea and its resources, a detailed knowledge which can only come from consistent and sustained scientific enquiry. And here is the rub: In countries which have difficulty in maintaining an adequate research activity with respect to the resources of the land, how can they quickly cope with the even more complex problems of the resources of the sea? In addition, management of the EEZ requires the establishment and maintenance of adequate administrative machinery, usually at both the national and regional level.

One subset of the issues facing developing countries is that of access to information about these potential new resources and about the technology which may be used to exploit them, these technologies often being controlled through patents or licensing arrangements by multi-national corporations. Access by the developing countries to such technology may well prove to be extremely difficult and expensive to obtain. There is the danger that the multi-nationals will use their position of negotiating strength to extract one-sided concessions during negotiations with the developing countries. It appears to me that the relative positions of strength in bargaining, in the case of activities within the EEZ's, is based upon the very different levels of access to information and knowledge about the resources of the sea, enjoyed by the MNE's on the one hand and by developing countries on the other. This is the gap in knowledge which developing countries must seek to fill.

The second problem I wish to raise is that of regional cooperation. It is an unfortunate fact of the political life of this planet that regional cooperation is much sought after but rarely achieved. In looking around the developing world, one can cite very quickly a whole series of now defunct entities like the East African Community, the Federation of the West Indies, and the Federation of East and Central Africa, as examples of attempts at regional cooperation which did not work. One of the few examples which gives hope that such cooperation can in fact work and grow in strength is that of the ASEAN Community. But how, might one ask, can one manage the resources of the sea, particularly the fish species which have not yet learned to respect international frontiers, unless one is to promote international cooperation among adjacent states. Perhaps the realization that the management and conservation of the resources of the sea can only be successful if undertaken on a supra national basis will be the spur to promoting at least a

basic minimum level of scientific and administrative cooperation in a variety of regions of the Third World.

A very specialized issue which might be called one of regional cooperation, and which I would like to raise, is that of the status of the landlocked countries. It is true that the Convention has gone a long way towards protecting the right of access of landlocked states to and from the sea and to protect their freedom of transit. However, the protections are of a highly generalized nature, and essentially it is left to the states to regulate these matters by mutual consent. For instance, article 1.25 (11) provides that

the terms and modalities for exercising freedom of transit shall be agreed between the landlocked states and transit states concerned through bilateral, subregional or regional agreements.

The statement is at best a guideline, and one which remains limp and lifeless unless followed by concrete action involving the landlocked states on the one hand and the littoral ones on the other. In addition to questions of transit, while no claim of the landlocked states to the resources in the EEZ is expressly recognized in the Convention, this point could be a source of discord in future relations between landlocked states and littoral states claiming EEZs.

If the problems of the management of an economic zone and of regional cooperation in this subject matter are of importance to the developing world, what then is the role of research? Perhaps the answer to that rather rhetorical question is self-evident to the members of this audience. Research is the basic process which will yield the vital information upon which any rational plan for the management and conservation of the resources of an extended economic zone can be based. It is the process too of searching out solutions to the administrative, legal and even political problems which surround the prospects of regional cooperation. Given our view of the importance of research, IDRC had decided to make its first tentative steps towards supporting research related to the development of marine resources. We began by supporting what turned out to be both a fascinating and useful seminar on the development aspects of the new law of the sea as they applied in South Asia, particularly as they applied to the South China Sea. As a result of that modest venture, it is our hope that there will be forthcoming proposals concerning the steps which countries of the region could investigate together, in collaboration perhaps with Canadian scholars, relating to the assessment of the resources of the area and the management of those resources. I will keep my description of possible activities rather vague at this time since we have yet to receive the formal proposal which we expect in the near future.

In entering this field, IDRC is very conscious of other bodies existing or about to be created in Canada which have

Interests that appear to be similar to our own. Given for example the role assigned to Petro-Canada international by the government of Canada in the area of off-shore exploration for petroleum resources, I would not expect to see IDRC active in that very expensive field at all. Similarly, should the federal government's proposal to create an International Centre for Ocean Development become a reality in the near future, then I am sure that IDRC would wish to cooperate with that institution to ensure that neither simply duplicated the other's activities. But IDRC will be prepared to look at possible collaborative activities involving Canadians and their colleagues in the developing world, which treat the problems confronted by development by attempting to turn into a reality the potential offered by the resources of their new exclusive economic zones.

COMMENTARY

Carlyle L. Mitchell
Consultant

I would like to thank the three speakers of our panel for their very informative and interesting presentations. I am aware that I have a rather onerous task as the last discussant on the program. At a conference of such length, I have a good chance of putting many of you to sleep. Not being the soul of wit, I will attempt to be brief.

As a Canadian whose birthplace is Grenada in the West Indies, I am pleased that Mr. Mullin spoke about the interests of those who are under-represented here -- at least as far as the panels are concerned -- the Third World countries. Yet we know that these countries, even though they have great differences, have been able, in the Group of 77, to come together at UNCLOS III and exert a powerful influence on the terms of the treaty and on its possible outcome.

The main reasons for their coming together were economic. They wanted to obtain management responsibility for the ocean resources off their coasts, so that these resources could be used to foster their economic development; and to ensure that the powerful maritime nations, with capital, expertise and technology to exploit marine resources within and outside the 200-mile limits, would not necessarily be able to do so under the free entry conditions, as they have done in the past.

As a result of UNCLOS III, the resources of the offshore areas of the ocean are about to be enclosed for coastal states, and those of the International Area of the sea-bed to be controlled by the International Seabed Authority. These, particularly the former, have important economic implications. Enclosure is not a new phenomenon in economic history. Enclosures have been necessary, whether in Europe in the 16th century or in the United States in the 19th century, to avoid the economic problems caused by overuse of common property resources -- the so-called "tragedy of the commons."

The enclosure of ocean space will cause great problems for Third World countries. They will find that the exercise of their new responsibilities will be costly in terms of technology and expertise. Again, Mr. Mullin gave some very useful insights into these problems between the theoretical (i.e., the potential) and the real (i.e., the constraints under which these countries will have to operate).

Mr. Leger was able to indicate the role that Petro-Canada International could play in oil and gas exploration, again in Third World countries, and I was very heartened by the progressive, understanding and sympathetic approach of that Institution. I only hope that he will be able to get some more funds in the future to expand on this activity.

Mati Pal's paper touched on a very important topic: the use of market forces. It was opportune, because earlier in the week we had been exposed to a rather bizarre rendition of what uncontrolled market forces actually can do for us. I think the

impression that the greater use of these forces can lead to greater efficiency and less regulation has to be tempered somewhat, particularly for ocean industries. First of all, the market does require regulations; these establish the boundaries within which market forces are allowed to work. Second and more relevant to ocean industries, the common property nature of ocean resources and the existence of free entry to them have resulted, in the past, in overexploitation (due to excess capacity), low incomes and low returns. All of these, as we have learned in this session, have been characteristics of the marine industries, such as fisheries, offshore oil and gas, and shipping.

We have seen too that marine industries have been treated and managed individually (as single industries) rather than collectively. I would like to point out, however, that continuing this single management approach will result in: (1) the continuance of the economic problems faced by these industries, even with the new EEZ regimes; (2) greater complexities in their management; and (3) greater political flak and crisis in the world.

Thus, although ocean management is still in its infancy, there is no doubt in my mind that we have to move towards an integrated approach to this management. I think it's quite easy to prove to politicians and decision-makers that the economic benefits of such an approach are great and will probably exceed the costs. This is because of the characteristic features of ocean industries. Apart from their common property nature, ocean industries are highly competitive. There is competition between them for space and resources, as well as for capital and labour inputs. For example, fisheries, offshore oil and gas, and ocean transportation compete for the use of marine space; commercial and recreational fishermen compete for fisheries resources by species and area; and offshore oil and gas, ocean transportation, fisheries and tourism compete for capital and labour, due to the tendency of these factors to move to industries which attain greatest returns. Finally, ocean industries are high environmental risk impact industries. Their exploitation can cause problems ranging from habitat degradation and overexploitation of the living resources to pollution of the marine environment and coastal zones. As a result, ocean industry has been characterized by competition, conflict and complexity.

The various sectors of ocean industry exert strong influences on each other, however. The synergetic effects of these can be taken advantage of to ensure their "best use" and to make a maximum contribution to economic development. For example, oil and gas production could be of tremendous benefit to traditional fishing industries. These industries have been plagued with excess capital and labour. The development of an oil industry can provide good alternative opportunities to fishermen and fishing boats. Thus, instead of these industries viewing each other with fear and alarm, a positive and integrated approach to their development is possible.

The prospects for ocean industry management in aiding economic development are, therefore, great. What will be required is an integrated framework to place the industries together as a system and to manage them accordingly. This is the challenge we face in the years to come.

DISCUSSION AND QUESTIONS

ARTHUR HANSON: Unfortunately we have almost run out of time, but perhaps we could have two or three quick questions or comments.

ALDO CHIRCOP: Mr. Leger referred to exploration and exploitation activities in several Caribbean countries and Petro-Canada International's development assistance role. I wonder what sort of contracts were entered into with these countries.

GEORGES LEGER: Actually, there is no contract, as such. We enter into memoranda of understanding or aid agreements. If we find oil or gas under a development assistance project, it is for that government (or national oil company) to determine what to do with it: whether to put it up for bidding, to do it themselves, or perhaps to enter into a joint venture. It's the sovereign right of the beneficiary of development assistance to make these crucial decisions. We simply serve as catalyst. We are not trying to displace private investment. We are anxious to help in areas where, for some reason, private investment is not immediately forthcoming, although the geological potential seems promising. We try to do some exploration and obtain some data where small discoveries may be made which are not exciting for the major oil companies but may help a small country to obtain self-sufficiency.

PHIPHAT TANGSUBKUL: I wonder if you, or Petro-Canada International, have had any experience of negotiating contracts for exploration or exploitation purposes.

GEORGES LEGER: On a couple of occasions we have run up against problems in disputed areas. Generally we try to establish a modus vivendi if there is some kind of unsettled boundary or jurisdictional issue in the area where we are asked to provide assistance. It is best if it is agreed that we make all our information available to all parties to such a dispute, on a non-prejudicial basis.

ARTHUR HANSON: Unfortunately our time has expired. In closing the session I would like to thank all participants for their outstanding contributions.

LUNCHEON SPEECH

CHINA AND THE LAW OF THE SEA

Wang Tie-ya
Department of Law
Peking University

It is my great pleasure that I have the opportunity of attending this 16th Annual Conference of the Law of the Sea Institute. I am most grateful to the Institute and Dalhousie Ocean Studies Programme for enabling me to make this visit to meet old friends and make new acquaintances.

The Law of the Sea Institute is well-known to international lawyers of all countries. Its proceedings furnish precious materials for all those who are interested in the law of the sea. Its influence is distinct and outstanding. The Institute is an American institution, but it is international in all other respects, in the sense that its annual conferences are usually co-sponsored by academic bodies of other countries and attended by participants from many countries. Several Chinese scholars and students have attended the LSI Conferences in the past, and I hope more will be able to come in the years ahead. It is my conviction that a broader exchange of ideas is a prerequisite to a better development of the law of the sea.

The law of the sea is a vast subject which involves every aspect of human life, and is very important to every nation. The sea serves not only as a medium of transportation and communication, but also as a valuable source of food and materials. So, the complexity of the subject is quite striking. Today there are so many difficult questions in the law of the sea, in which the vital interests of many nations are deeply involved, that the concerted efforts of all nations must be made to reach an overall and reasonable solution.

After so many excellent papers and discussions, I have nothing to add to the main theme, but perhaps I could say a few words about my personal view of China's position on some law of the sea issues.

China is a maritime country facing a vast semi-enclosed sea. She has a long coastline of approximately 11,000 kilometres in the mainland, with another approximately 10,000 kilometres surrounding her islands. Along the coast are about 3,500 islands, small and large, the largest one being Taiwan, a province and an integral part of China. There are also two large gulfs: one internal, Bohai, and another, Beibu, shared with Vietnam. China also has two important straits: one international, the Taiwan Strait, which is 83 to 140 nautical miles wide, and the other internal, Chungchou Strait, which is 9.8 to 19 nautical miles wide. These geographical features indicate the importance of the sea to China and also her attitude toward the law of the sea.

Historically, it cannot be said that the Chinese people have had little concern with the sea. On the contrary, historical records show that the Chinese began their maritime activities as early as 1,000 B.C., or thereabouts. Both ocean

navigation and sea defence in China have had a really long history. A few facts will suffice to illustrate the point. Sea routes had been established with Korea, Japan and Indochina a century before the birth of Christ, and extended to the Indian Ocean even before the Roman Empire, during the Han dynasty from 205 B.C. to 220 A.D. In the Tang dynasty (618-907 A.D.), overseas trade flourished and the coastal ports were opened to thousands of foreign vessels. Then, in the early 12th century, the compass was invented and came into general use among Chinese navigators. The most prominent event, of course, was the historic undertakings of the great Chinese navigator, Zheng Ho, who sailed seven times through the Indian Ocean and the Arabian Seas from 1405 on, with fleets of 40 to 200 ships, the largest of which had about 1,000 men on board.

This does not mean that throughout her long history of 4,000 years, China has made constant and intensive use of the sea. The main thing is that the Chinese governments of various dynasties paid attention to the sea, not only for trade, but also for national defence. Indeed, they regarded the sea as a natural barrier against foreign invaders.

There were changes in policy. The most radical one came when Zheng Ho undertook his adventurous sailings in the Ming dynasty (1368 - 1644). In 1523, when Japanese pirates along the Chinese coasts had to be suppressed, the adjacent sea was declared to be a closed sea under imperial decrees, as a matter of fundamental national policy. It is true that later, in 1684, the great Emperor of the Qing dynasty, Kang Xi, rescinded the "closed sea" decrees, but 32 years later, in 1717, the same Emperor rescinded his own decree and revived the policy of a "closed sea". This became part of the "closed door", isolationist policy of modern China until the door was forced open by foreign powers in the 19th century.

The history of modern China since the Opium War of 1840 is well known. During the years thereafter to the founding of the PRC in 1949, time and again China suffered a lot from foreign oppression and aggression. In most cases of foreign invasion, the sea was used as the main route, becoming a place for devastation, destruction, and plunder. In a condition of powerlessness, China allowed herself to be trampled upon until the founding of the PRC in 1949, which opens a new page in the modern history of China.

Against this background, it is quite natural that the Chinese government and people should take national defense as the first consideration in formulating their maritime policy. However, some weight was given to other factors, when the economic reconstruction of the country was being undertaken. For example, since 1949 strenuous efforts have been made to develop Chinese maritime shipping. In thirty years it has expanded considerably, from a tiny fleet to a large one, which today visits more than 100 countries and 420 foreign ports. Treaties of commerce and navigation and marine shipping agreements have been concluded with more than 30 countries. A

new maritime law is now in the drafting stage, and will be completed in the near future.

The most important legal document concerning the sea which China has ever issued is the Declaration on Territorial Sea of September 4, 1958, which expresses clearly the attitude of PRC on some aspects of the law of the sea. The width of the territorial sea is fixed at 12 nautical miles, the method of straight baselines for measuring the territorial sea is laid down, and the status of certain bays and straits is defined. These claims are in conformity with the Draft Convention of UNCLOS III or with the recognized principles of international law. One provision needs some explanation, however. In the Declaration, it is provided that: "No foreign vessels for military use and no foreign aircraft may enter the Chinese territorial sea and airspace above it without the permission of the Government of the PRC." It should be remembered that the Declaration was made not only after the conclusion of the 1958 Geneva Conventions on the Law of the Sea, but during the Taiwan Strait crisis of that year. Its purpose is to preserve the sovereignty and territorial integrity of China and to consolidate her defense and security. The United States government disregarded this Declaration and continued to send military vessels and aircrafts into and over China's territorial sea up to the 3-mile limit to challenge the PRC position. The Chinese government responded by issuing more than 100 "serious warnings".

On July 14, 1973, the Chinese delegation to the United Nations Seabed Committee submitted a Working Paper on the Sea Area within the Limits of National Jurisdiction. In the Paper it is stated: "A coastal State may, in accordance with its laws and regulations, require military ships of foreign States to tender prior notification to, or to seek prior approval from, its competent authorities before passing through its territorial sea." It is quite significant that the phrase "prior notification" is added to the phrase "prior approval". Both are meant to be included as methods of obtaining permission. On March 20, 1980, during the 9th session of UNCLOS III, China joined six other states in submitting a new informal proposal which would have permitted the coastal state to adopt laws and regulations, in conformity with the provisions of the Convention and other rules of international law relating to innocent passage through the territorial sea, in respect of, inter alia, "the navigation of warships, including the right to require prior authorization or notification for passage through the territorial sea." Thus, prior authorization is again supplemented by prior notification. The proposal was discussed, and while most states supported it, certain maritime powers voiced their opposition. As consensus was not reached, the proposal was not incorporated in the draft Convention.

It may be arguable that, in accordance with the recognized principles of international law, the coast states may require prior authorization or notification as a condition for foreign warships to pass through their territorial sea. At any rate,

prior notification is a simplified procedure which any state can easily fulfill without undue delay or impediment to the passage of their warships through the territorial sea of another state. The latter is expected not to refuse, unless serious suspicions are entertained. The addition of the alternative requirement to give prior notification seems to be a reasonable compromise between the security interest of the coastal state and the navigational interest of the transiting state. It may be appropriate to improve the relevant provisions of the draft Convention in order to avoid the possibility of misunderstandings or even conflict.

Now let me turn to UNCLOS III itself. The Conference is very important, even epoch-making. In modern times, especially since the end of the Second World War, great political, economic and technological changes have taken place, requiring radical changes in the law of the sea. The law has had to be rewritten or completely revised. In attempting this arduous task, the Conference has passed through eleven sessions since 1973, but has now reached its final stage. In the long negotiation process, the Conference has faced many difficult issues which involve the political, economic and strategic interests of all states, developing and developed, coastal and land-locked. With 157 states participating in the last session, UNCLOS III is the largest, as well as the longest, conference in the history of the United Nations.

The People's Republic of China began participating in the United Nations Seabed Committee as soon as she returned to the United Nations, and has been an active participant at the Conference itself. As China is a big maritime country, all the issues raised at the Conference touch Chinese principles and interests, political, economic and strategic. As a matter of fact, the attitude and position of the Chinese government on the main issues of the law of the sea are quite clear. It is partly expressed in the 1958 Declaration on the Territorial Sea, and partly in statements concerning the continental shelf in the East China Sea. The first of these statements was prompted by the proposed semi-official joint development of the seabed by Japan, Taiwan and South Korea in the vicinity of Taiwan and the Taoyutan Islets in 1970. It is also quite well known that the Chinese government has consistently supported the claim of a 200 nautical mile belt by several Latin-American states. In the Seabed Committee, the Chinese delegation presented three Working Papers indicating the principles upon which the main issues of the law of the sea should be solved, and at the Conference the statements made by the Chinese delegation elaborated and developed these positions more clearly.

It can be seen the main elements which determine the position of China are twofold: First, as a maritime country, China has her own peculiar interests. Security is always the first consideration. In engaging in a new economic reconstruction, which constitutes an essential part of her plan for "four modernizations", China must also take account of her economic interest in the ocean. Second, as a developing

country, China belongs to the Third World. She has many things in common with other Third World countries. Viewed from the Third World, the existing law of the sea in large part reflects the desires and demands of most industrialized states, without adequately reflecting the wishes and interests of the developing countries. The law needs to be transformed into a new international code. China joins with other Third World countries in striving to realize this aim. As a matter of fact, the Third World as a whole has made a significant contribution to the achievements of the Conference.

After nine years of protracted negotiations, a comprehensive draft Convention on the Law of the Sea was finally adopted by a vast majority. It is an impressive legal document consisting of 320 articles and nine annexes. It will be opened for signature at a ceremony this December and will become a world constitution for the sea when ratified by 60 states, as required for its coming into force. This emergence of a new world order for the sea is, I think, a great victory for the Third World countries.

Some States have voted against the Convention, notably the United States, a powerful maritime state, with unmatched technological and financial capabilities to explore and exploit the resources of the deep seabed. From the beginning of the Conference, the regime of the international sea-bed has been a focus of controversy and a matter of confrontation between developing and industrialized countries. Just when it seemed that the Conference had succeeded in reaching compromise on most points, the United States government decided to review all provisions of the draft Convention and to present a series of amendments to the Conference. This serious step was tantamount to renouncing the basic principle of the regime on the international sea-bed, the principle that the international sea-bed and its resources are the common heritage of all mankind. The Conference was then at the verge of foundering. In order to save the Conference and its work from being frustrated, there remained only one course: to complete the Convention without the United States. When the latter pressed for a vote, 130 states voted in favour of the Convention, with four against, and seventeen abstentions.

China stands for and insists on the concept of the common heritage of mankind, although she did not participate in the Resolution passed by the General Assembly in 1970, in which the principle of the common heritage of mankind was declared, because at that time, China had not yet resumed her seat in the United Nations. In one Working Paper, which the Chinese Delegation presented to the Seabed Committee in 1973, it was asserted that all resources in the area beyond national jurisdiction "...are, in principle, jointly owned by the people of all countries". The attitude of the Chinese Government in this matter is quite clear.

The concept is a revolutionary one, in the sense that it differs in nature from the traditional freedom of the sea. It is now settled that the principle of the freedom of the seas

applies to the open sea water, but it is also clear that the principle cannot apply to the resources of the sea-bed. In the area of the sea-bed beyond the limits of national jurisdiction a new regime must be created, and so emerges the concept of the common heritage of mankind. If it were legally possible to acquire possession of the seabed through effective occupation, that would be tantamount to awarding control of seabed resources to the developed states. Such a scenario would result in a scramble for seabed "colonies" and create the need for a new struggle to eliminate a new form of neo-colonialism. This would lead to an era of unrest and severe international tension, which our generation has the obligation to avert.

Of course, the common heritage concept, in order to be effective, needs further elaboration and detailed provisions. Under the concept, it has been generally agreed that an international regime should be created and an international authority established. As to the nature of the international regime and the kind of international authority, opinions differ. Through strenuous efforts some compromises have been reached, and with mutual concessions further compromises have been reached, and with mutual concessions further compromises are possible. But one thing is certain: There will not be, and cannot be, any modification or revision of the provisions concerning the international regime of deep seabed which would jeopardize the principle of the common heritage of mankind -- a cornerstone of the regime. This is the position of the Third World countries, which China ardently supports, and which, I think, is fair and reasonable.

The draft Convention is really a compromise package deal. Everywhere you can see traces of compromise. From this perspective, I would like to take a subject which is one of the core issues at the Conference, the delimitation of the continental shelf boundaries between adjacent or opposite states. An article was incorporated in the revised Informal Composite Negotiating Text of 1979 to the effect that delimitation "...shall be effected by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistance line, and taking account of all the relevant circumstances." This was clearly a compromise between two rival ideas: one favouring the method of equidistance, the other emphasizing equitable principles. But as neither side was satisfied with the provision, the negotiations dragged on until a new compromise came up at a late stage. It is now briefly stated in the draft Convention that the delimitation "...shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable solution." Explicit references both to equitable principles and the equidistance method are deleted from the text, and "international law" is used as the basis for the delimitation of the continental shelf boundaries. This means that the parties concerned in each case will have to decide which principles of international law are applicable to their case.

The position of China in this respect is quite clear. From the Working Papers presented to the Seabed Committee and the statements given at the Conference, several points are consistently emphasized. First, the concept of "natural prolongation" is considered as the basis for the delimitation of the continental shelf boundaries. Second, the delimitation should be effected through negotiation or consultations by the parties concerned. Third, the consultations should be conducted on the basis of equitable principles, taking into account all relevant circumstances, the equidistance method being acceptable only when in accordance with equitable principles.

The continental shelf as a legal term is to be distinguished from its geological connotation. But it cannot be divorced from the physical fact that the submarine areas called continental shelves are the natural extension of the coastal state's land territory. This fact is the main ground upon which the Truman Proclamation of 1945 made the claim for coastal state jurisdiction over the resources of the continental shelf. The 1969 Judgment of International Court of Justice in the North Sea Continental Shelf cases has brought the concept of "natural prolongation" into prominence. It cannot be denied now that the concept has been accepted in theory as well as by state practice. The continental shelf has been defined in Article 76 of the draft Convention as "the seabed and subsoil of the submarine areas that extend beyond the coastal state's territorial sea throughout the natural prolongation of its land territory...". It is also beyond doubt that the concept of natural prolongation should have a determining influence on the delimitation of continental shelf boundaries between adjacent or opposite states.

As to the second point, there is no controversy. All agree that negotiation or consultation in order to effect an agreement is the first and essential requirement of successful delimitation of continental shelf boundaries. It has to be emphasized that negotiation or consultation is not a mere procedure, but a legal obligation which cannot be lightly treated. Serious efforts should be made in order to attain the best possible results in negotiation or consultation.

The most controversial issue is between equitable principles and the equidistance method. The position of China is that equidistance is one of the criteria for delimiting continental shelf boundaries, which under certain circumstances may be a reasonable criterion and may lead to a reasonable and satisfactory result. Most of the delimitation agreements which have come into force illustrate the usefulness of this method of delimitation. But it is in no case the only criterion or the only method of delimitation. The problem is that the geological structure of the continental shelves is so diverse that no two boundary situations are identical. Each has its own characteristics. So there cannot be a unified method of delimitation applying to all cases. One method that may reasonably apply to one boundary may create very unreasonable results when applied to another boundary.

It is true that in most of the boundary agreements which have been negotiated and put into force, the equidistance method is used or declared to be the basis for the delimitation. But the method is not adhered to strictly in every case, and some modifications are sometimes needed in order to reach agreement between the parties concerned. What is more important is the fact that the number of existing binding agreements is rather small in comparison with the cases where negotiations have not reached satisfactory results or have not yet been initiated. If we glance at the Pacific region, we can see that most continental shelf boundaries have not yet been delimited. This fact demonstrates clearly that delimitation is not an easy task, that no hard and fast rule can be applied to solve the problem, and that the rule of equidistance will not be accepted by most states as the only basis of ocean boundary delimitation.

Consequently, flexibility should be the key to such negotiations or consultations. In other words, equitable principles should furnish the proper basis. Each case should be dealt with individually, and all relevant factors should be considered for the determination of the boundary. Appropriate weighing should be given to all elements: physical, economic and political. The physical elements should include the geographical situation, the geological condition, resource location, and so forth.

As a matter of fact, the idea of equitable principles comes directly from the well-known Truman Proclamation of 1945, where the legal concept of the continental shelf was first declared. The Declaration stated: "In cases where the continental shelf extends to the shores of another State, or is shared with an adjacent State, the boundary shall be determined by the United States and the State concerned in accordance with equitable principles." The idea was adopted and given saliency by the International Court of Justice in its famous North Sea Continental Shelf award where it stated that "...delimitation is to be effected by agreement in accordance with equitable principles, and taking account of all the relevant circumstances..." The equitable principles approach has also been adopted by the Court of Arbitration in its decision of 1977 in the France-United Kingdom Continental Shelf Case. Is it not possible to say that equitable principles would in all probability be the proper basis for the future delimitation of continental shelf boundaries?

China has a wide continental shelf, the area of which, measured to the 200-meter isobath, is more than one million square kilometers. The Chinese government has made a number of geological surveys of the continental shelf since 1960, and more extensive studies since 1970. Since inaugurating her "open door" policy, China has paid much attention to the exploration and exploitation of petroleum resources in her continental shelf. It is now recognized that China probably has a very large petroleum resource base and that her offshore production is likely to increase rapidly in the next five to ten years. But the trouble is that the continental shelf of China overlaps

with the continental shelves of some neighbouring states, both adjacent and opposite. Conflicting claims have been made by several of those states, raising difficulties in the delimitation of continental shelf boundaries in the region. It is our conviction that negotiation or consultation in accordance with equitable principles is the only way to solve the problem and avoid international tension and conflict. It is quite understandable that under favorable political conditions joint and cooperative exploitation of the resources of the continental shelf may be a good alternative to definite delimitation, if negotiation or consultation fails to produce agreement.

In concluding my short talk, I would like to mention the recent steps taken by the Chinese government with respect to her petroleum policy. The most important one is perhaps the promulgation of the Regulations of the People's Republic of China on Exploitation of Offshore Petroleum Resources in Cooperation with Foreign Countries by the State Council on January 30, 1982. Under these Regulations, foreign enterprises are permitted to participate in the cooperative exploitation of offshore petroleum resources of the People's Republic of China, including those of the continental shelf of the PRC. It is clearly provided that the Chinese government will protect investments by foreign enterprises participating in the exploitation of offshore petroleum resources, guarantee their share of profit, protect other legitimate rights and interests, and support their activities in cooperative exploitation. A domestic corporation, the China National Offshore Oil Corporation, was established on February 15, 1982, and directed to take full charge of offshore oil exploitation in cooperation with foreign enterprises. These initiatives reflect China's present policy toward petroleum exploitation and will have significant impact on the solution of the continental shelf boundary delimitation problems between China and her neighbours.

It has been said that the Chinese people have a long tradition of preferring to settle their disputes by negotiation and conciliation rather than by resorting to judges and courts. This tradition has its effect on the Chinese attitude toward international problems and controversies. This does not mean, however, that no legal principles should be respected. On the contrary, some legal principles must be strictly adhered to in international relations; for instance, the principles of sovereignty, equality, and non-interference in one another's domestic affairs. What it does mean, in dealing with concrete cases, is that in order to solve the difficulties, the parties to a dispute should seek the mutual interest and be prepared to make concessions. This is the very essence of the equitable principles approach, which I have been discussing. I think this is the tradition most deserving of preservation, and the approach most likely to assist in the solution of these complex problems of delimitation.

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