MINING IN INTERNATIONAL WATERS

By J.R. Harry

The oceans are now recognised as an abundant and varied resource. Scientists are learning to generate electricity from waves, tides and heat differences between water layers; to farm and reap vegetable and fish protein; and to extract trace elements from sea water. The richest ocean resources are the small black spheres on the deep seabed known as manganese nodules[1] containing high proportions of manganese (30 per cent), copper (1.2 per cent), nickel (1.4 per cent), cobalt (0.25 per cent) and several other metallic elements.

While nodules were discovered by British oceanographers over a century ago, close study of their composition, distribution and economic potential only began in the 1950s.

It has been found that vast areas of the sea floor are carpeted with nodules of exploitable grade. Nodules form continuously, so that the resource as a whole is self renewing. The volume of nodules is thought to contain many times as much manganese, nickel, copper and cobalt as is found in all known land sources.

Large sums have been spent by several consortia, mainly led by miners from the United States, in evolving the complex technology needed to find and dredge nodules economically. It seems that technically, the job is over. Some consortia believe that they will be ready to mine in the 1980s. This has been an enterprise of great ingenuity and courage in the classic risk-taking tradition of the industry.

The main check on seabed mining has been the lack of a legal regime providing reasonable security for miners and bankers.

The third[2] United Nations Conference on the Law of the Sea (LOSCON) has met eight times since 1973 to review the law of the sea and in doing so to agree on a regime for the exploitation of seabed resources in international waters.

A critical factor in the negotiation has been the insistence of less developed countries (LDC) that the new regime must be truly international and direct a large part of the economic benefit of seabed mining toward closing the gap between rich and poor countries. There is some understanding between LDC and developed states in that the U.N. General Assembly resolved nearly unanimously in 1970 to internationalise the resource taking the interests of LDC into account.[3] But debate on the details of the administrative structure, access rights and distribution of mining revenues has split LDC and developed states as to the application of the U.N. resolutions and has been strongly affected by ideology and economic chauvinism. LOSCON has thus not yet agreed on a system for exploitation. The eighth session of LOSCON, which finished in Geneva this month, still has not settled many core issues, or a treaty text.

LDC have a greater interest in other LOSCON issues — such as the freedom of navigation, pollution control and the creation of 200 mile exclusive resource zones — than in the small income redistribution which mining revenues paid to an international authority might bring. However, dispute over the international seabed regime has created such political polarisation between North and South and has become so symbolic to LDC at LOSCON that the whole treaty has come to depend on a seabed agreement.

In answer to the long failure of LOSCON to settle a seabed regime, some

developed states with strong deep seabed mining interests including the United States, West Germany, Japan and the EEC nations have been moving steadily closer to passing of domestic acts to protect and encourage their seabed industries. The United States seem likely to pass an act within months. Domestic acts will include systems of reciprocal recognition of non-competing claims by licensees of other states. A network of reciprocal domestic statutes would constitute a mini-treaty[4] and might delay, and perhaps endanger, the prospect for a widely recognised Law of the Sea Treaty.

Few Australian resources lawyers and companies have taken close interest in the development of the law of the international seabed. This is in strong contrast to the involvement of their colleagues in Europe and North America. Yet there are important reasons why both resource lawyers and companies in this country need to learn about the evolving international system.

Seabed mines will one day compete strongly with land mines and Australian miners will undoubtedly join seabed consortia. Recent indications are that areas of the Indian Ocean close to Australia will make prime mine sites.

Since the first nodule deposits to be mined will be in the Pacific between Hawaii and California, Australian lawyers may be asked to act for deep seabed miners wishing to establish processing and support facilities here.

The mineral and energy resources of Antarctica in which we have a strong national interest will attract pressure from LDC towards internationalisation on a similar basis to that under study at LOSCON.

Finally, the LOSCON negotiation provides valuable lessons in the pitfalls and techniques of multi-lateral and bi-lateral negotiation with third world countries. Lawyers may need these lessons, for example, to advise Australian resource companies about the merits of and approaches to international commodity cartelisation.

This paper is in six parts:

First, the border between national and international seabed will be described.

Second, the composition and practical progress of the deep seabed mining consortia will be surveyed.

Third, the current law of the international seabed and history and current state of LOSCON will be investigated.

Fourth, the most recent (1977) draft LOSCON negotiating text for a treaty to regulate seabed mining will be reviewed.

Fifth, the currently proposed forms of domestic legislation will be analysed.

Finally, the nature of the regime to emerge will be evaluated.

Emphasis has been given to a review of the draft LOSCON text. While prediction of the outcome is dangerous, the writer is confident that a treaty much in the form of the LOSCON text will be agreed, ratified and come into effect. Even if domestic legislation is passed authorizing mining, it will be interim and be superseded by a treaty. Miners must know and understand the effect of change to an international regime before further development or investment can take place.

1. THE LIMITS OF NATIONAL JURISDICTION

Under customary international law,[5] states have exclusive rights to exploit their continental shelves. As a result of wide consensus at LOSCON, the "continental shelf" of a state[6] can now be regarded as "the seabed and subsoil (of the relevant state)

extending . . . to the edge of the continental margin, or 200 nautical miles from the (territorial sea) base lines . . . (whichever is the further)".

The continental margin of a state consists of the true (geomorphologically speaking) continental shelf which slopes downwards at a shallow angle to the depths of approximately 200 metres, the continental slope which falls away from the shelf at a much deeper angle to depths of between 1,500 to 4,000 metres and lastly the continental rise which slopes down this time more gently to meet the abyssal ocean plain at depths of 4–5,000 metres.

LOSCON has also largely agreed that states may assert general rights of economic exploitation including rights to the seabed in an exclusive economic zone to extend 200 miles from territorial sea base lines.[7]

While the rights of states to mineral resources of the seabed out to the 200 mile limit derive from these two quite separate regimes, they are for practical purposes merged.

Thus, all sea areas outside the outer edge of states' continental margins are international waters. The seabed beneath them, which will be referred to below as the "Area", is the international seabed. Almost all deposits of mine grade nodules are thought to lie on the international seabed well outside any state's continental margin, so that no boundary disputes between states and an international authority are expected. The international regime currently proposed at LOSCON would control resources on and below the seabed, including petroleum. Geologists believe however that only 2 per cent[8] of the world's oil and gas lies in the international seabed.

There is no current proposal for internationalisation of the resources of international waters themselves. These would presumably still be governed by the doctrine of the freedom of the high seas.[9]

2. TECHNOLOGICAL DEVELOPMENTS

(A) The Resource

While nodules occur throughout the oceans, only about 3 per cent of the total ocean floor has been surveyed in any detail, primarily in the eastern Pacific north of the equator, as a result of its proximity to the United States. Based on known concentrations, compositions and other factors such as proximity to on-shore processing sites and markets, the most attractive deposits identified to date occur in this region. Another area of interest lies in the south Pacific near Polynesia. Estimates of the recoverable volume of nodules varies, but in an extremely high order of magnitude, from 100 to 1,600 billion dry tonnes. Two factors suggest that the higher figure is correct; first, the mining companies, which have done far more prospecting than the scientific institutions and have access to a much fuller data base, are clearly assuming that the number of profitable mines the resource can support is very large. Some industry statements claim that the nickel contained in just two commercial deep sea deposits could almost equal the total size of the world's known land based reserves. Second, large parts of the oceans, particularly the Indian Ocean, are essentially unexplored, but nodules of good grade have been found in them and it is most likely that they will contain exploitable deposits.

Manganese nodules are found spread out in a single layer, half buried in the oozy mud of the seabed at water depths of 3 to 5 miles. They grow over long periods from the rise of metallic solutions from deep sediments to the sea floor. The solutions are generated and driven to the surface by hydro-thermal activity within the ocean's

crustal plates. When they reach the water/sediment interface, metal oxides are precipitated and nodules form.

Because of the high metal content of nodules relative to land based ore and the tremendous size of the resource; nodules have generated great interest in industrialised nations as a future source of raw materials. For mining companies used to long, expensive and risky exploration programmes nodules mining has seemed ideal — meaning inexhaustible ore-bodies of known grade.

(B) Development

In the early 1960s, great leaps in ocean science resulting from the growth of the off-shore oil industry and new military uses of the seas encouraged some American companies to look at the future of nodule mining. The great technical problems which faced these companies is apparent: they had to build a system which could collect nodules from the sea floor mud in total darkness with complete navigational accuracy; produce one to three million dry tonnes per year; push or suck the mineral matter up a pipe several miles long, all at costs competitive with mining on land. Moreover, the metallurgical processing of the nodule material required new treatment because of its unusual physical and chemical nature. After almost twenty years and the spending of nearly $US250 million these companies and their foreign partners have created the technological tools to recover nodules and process them into useful metals. No new inventions or discoveries outside what is now known will be required before mining can begin. But long and costly engineering development must still be undertaken before ocean mining proves a practical and economic venture.

American, Belgian, British, Canadian, Dutch, French, German and Japanese companies are currently organised into five international consortia.[10] The largest are headed by Kennecott Copper Corp., U.S. Steel, Lockheed Missiles & Space Co., Inc., INCO and the French Group CNEXO. The programme of each consortium has focussed on extensive prospecting activity in the north Pacific region. Each group has now identified nodule deposits which could make profitable mines.

To varying degrees, all of the consortia have designed and tested the main components of nodule recovery systems. Three (U.S. Steel, Lockheed and INCO) have performed at-sea testing of a complete prototype mining system during the last year. Industry statements describe these tests as successful.

There are some minor variations in the extent to which metallurgy has been evaluated, although most companies have completed successful tests of their processing techniques on a small pilot plant scale.

(C) The Economic Outlook

When will ocean mining commence and how profitable will it be? Best estimates are that mining cannot begin commercially before 1985, or possibly later. World metal markets in recent years have been depressed and there is unlikely to be a demand for a new source of nickel and copper until then. Also, the development of a new industry requires long lead times for large-scale construction and financing.

All consortia intend to recover the nickel, copper and cobalt content of nodules and possibly molybdenum. Economically, nickel will be the most important component of seabed production and projects will depend on all available nickel being produced and sold. The larger size of the copper market means that if there is demand for all seabed nickel, the copper sale will not be a problem. Current economic analysis and the continuing confidence of the consortia indicate that seabed nickel will be

competitive with new land sources of nickel but will not displace present land production. Thus, as world demand for nickel grows, ocean mining should be able to occupy an ever larger place in world markets.

3. THE EMERGING LEGAL ORDER

(A) Commercial Requirements for a Legal Regime

Before examining legal developments in relation to the international seabed it may be worth noting the attributes which any system of regulation of mining is conventionally required to have before large scale investment will be made under it. These are:

(i) A reasonably assured right of access to exploitation.
(ii) Exclusive rights of exploitation.
(iii) Security of tenure.
(iv) Guarantees against discrimination by the regulatory authority.
(v) Known and reliable financial conditions.
(vi) Known national tax regimes.
(vii) Clear safety and environmental regulation.
(viii) A structure permitting consortium-style development and the granting of effective security over project assets and cash flow.
(ix) Protection of trade and technological information.

(B) Current Law

Ingenious argument has been developed by United States mining company counsel suggesting there is a rule of customary international law authorising private exclusive claim, by occupation and use, to mine sites on the international seabed.[12] One such company has gone as far as to publish a claim to a specific area based on this argument.[13]

There is no such rule. The view of almost all international legal scholars is that the high seas and international seabed are either "res nullius" (the property of no man) or "res communis" (the property of all men) and that in either case good title to seabed minerals can only be acquired, as an exercise of high seas freedom analogous to fishing, on possession. Obviously this framework would be inadequate for investors. Customary international law may develop towards allowing exclusive claims with the advent of mining under domestic legislation. However this possibility is irrelevant to current investment decision making.

(C) The Process of Internationalisation: The Third UN Conference on the Law of the Sea

LOSCON was called to meet a combination of district needs.

The 1958 Conventions on the Law of the Sea[14] failed to regulate some important areas. The 1958 Convention on the Territorial Sea left the outer limit of the territorial sea undefined. There was thus no legal bar to unilateral extension of territorial and other zones of control. Declaration[15] of 200 mile territorial seas by some Latin American states were signs of this "creeping jurisdiction". Large extensions of territorial seas would have meant for example that straits used for international trade and for missile submarine fleets would have been overlapped and subject to arbitrary closure.

On the other hand, coastal states were pressing for control over a wider coastal band as they realised the value of the oil and mineral wealth of the seabed and the exposure of fish stocks to foreign stripping.

At the same time, LDC, having won political freedom through decolonisation, began to seek means of changing the world economic balance in their favour. One expression of this wish was that there should be a reformation of sea law to return to LDCs economic rights over offshore areas which hitherto had mainly been exercised by developed states. This demand was associated with the desire of LDC to control foreign exploitation of national mineral resources to ensure optimum usage and equitable distribution of benefits. It was thought that a new sea law should include preferences for LDC to repair the economic harm done by exploitation during colonial years.

Finally, some diplomats thought that science and technology would in time lead to a large extension of the possible uses of ocean space for resource extraction and military purposes. They believed that unless there were some form of international regulation, the oceans would become the focus of uninhibited claims[16] resulting in conflict with permanently damaging consequences for mankind and the sea biosphere. An international control organisation might however enable royalty collection and a significant redistribution of these royalties to underprivileged peoples.

A resolution[17] was introduced into the United Nations General Assembly in August 1967 calling for an international treaty to reserve the international seabed and waters for peaceful purposes and to provide for the exploration and exploitation of the resources of the Area. The proposal included the concept that the oceans existed "for the benefit of all mankind" and that profits derived from ocean and seabed use should be used to develop LDC. The resolution itself was not passed, but was referred to committee for more study.[18]

The General Assembly in 1969 and 1970 respectively passed two fundamental resolutions. The first, the so called "Moratorium" resolution,[19] provided (in part) that:

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

The Moratorium Resolution was passed 68 to 28, with 28 abstentions. Most major industrial states voted against.

The second resolution,[20] known as the "Declaration of Principles" provided that:

> 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.
> 5. The area shall be open to use exclusively for peaceful purposes by all states . . . without discrimination in accordance with the international regime to be established.
> 9. On the basis of the principles of this Declaration, an international regime applying to the area and its resources and including appropriate international machinery to give effect to its provisions shall be established by an international treaty of a universal character, generally agreed upon . . .

This resolution was adopted by 108 votes to 0 with 14 abstentions. While generalised, it was a rare pact between developed and developing states with much political if not legal force.[21]

Later in 1970 the General Assembly resolved to convene a Law of the Sea Conference in 1973.[22] The scope of the conference was extended to include the other ocean issues of concern including the breadth of the territorial sea, straits, economic exploitation adjacent to the territorial sea, pollution and scientific research. A preparatory committee[23] was established but, unlike the preparatory committee for 1958 Conferences, was unable to prepare a draft treaty for consideration. This reflected the scope of the work before the conference — which was really to deal with a number of chronic post-war problems: reconciling national security with arms proliferation; finding rational and fair means by which to allocate the world's energy, food and industrial raw materials; and counter-balancing economic growth against ecological responsibilities.

Despite the absence of a draft treaty the General Assembly resolved[24] in November 1973 to convene a conference. LDC wished to proceed, no doubt influenced by their many common interests and by a full awareness of their voting strength. Developed countries, though emphatically denying that ocean problems of universal interest could be solved by majorities, agreed that the compromises necessary for a treaty could only be made in a plenipotentiary conference, and that a beginning should be made.[24]

It was only at the third session of LOSCON at Geneva in 1975 that a draft text for a treaty was prepared. This text, which became known as the Informal Single Negotiating Text was debated at the fourth session of LOSCON in New York in May 1976. A revised text was produced at the end of the fourth session. A further revision, known as the Informal Composite Negotiating Text, or ICNT, was produced at the end of the sixth session of LOSCON in 1977. Part XI of the ICNT deals with the seabed and will be referred to below as the "Text". The first of three committees of LOSCON was given the seabed negotiation and the Chairman of Committee 1, always an LDC representative, has prepared the various texts.

A revision of the ICNT was prepared during the recent concluded 8th LOSCON session. Unfortunately, time has not allowed reference to that revision.

Most of the Text is uncontentious and will find its way into a treaty, but areas in which it is contested are naturally hard-core. The Text itself deals with these problems either by slanting towards the LDC position or by resort to ambiguity. A satisfactory treaty will require more direct and simple solutions some of which will no doubt follow when the final substantive compromises are made.

(1) Basic Tensions in Committee One

Developed states, accepting the principle of international control, have tried to assure access to the Area by states, states' companies and the "Enterprise", an operating arm of the proposed international seabed authority, referred to below as the "Enterprise" and the "Authority" respectively. This has become known as the "parallel" system of exploitation. The system envisages that states and states' companies should, having satisfied the Authority of their standing, have the right to contract with the Authority to explore and mine. States and states' companies would, provided their essential interests were safeguarded, be bound by contract terms, the regulations of the Authority and decisions taken by the organs of the Authority. The Enterprise would also contract with the Authority and the Authority would not discriminate in the granting of rights in the Area.

LDC, on the other hand, have supported an Authority which has full control, on a one-state, one-vote basis, over exploration and mining, without entrenched vetos

or guarantees of access or non-discrimination for developed states. They claim all mining should be conducted exclusively through the Enterprise, or, as determined by the Authority, either through joint ventures between the Authority and states and states' companies, or by states or states' companies alone. LDC accept that the Authority should enter into negotiations with applicants but insist that the Authority should have the unqualified right to decline. Although LDC agree that the issues to be negotiated in contracts should be clearly set out in a treaty, they have sought maximum discretion by generalising these issues.

LDC say that if developed states accept the "common heritage" principle they should also accept a "democratically" (that is, one-state, one-vote) constituted Authority since no other would represent the interests of all mankind. Only then, and through the Enterprise, could the Area be exploited in the common interest.

Developed countries will not[26] accept any Authority with full control of access and regulation that is ruled by an assembly voting state by state. They say a permanent LDC cartel would result governing exploitation of the Area and discriminating against or prohibiting developed state operations. They fear that an organ voting like the United Nations[27] would sabotage their investments. Developed states interpret the "common heritage" as meaning that every state and its nationals should have equal rights in common to explore and exploit the Area.

(2) Protection of Landbased Producers

A third and separate interest group has emerged in the seabed debate. LDC operating land based nickel, cobalt and copper mines have succeeded in making protection of their production against seabed competition a basic feature of the proposed regime. There is no doubt that some kind of price support, compensation or seabed production limitation formula will find its way into a treaty.

(3) Mechanics of Negotiation

The process of multilateral negotiation itself has been hard. There are 158 delegations. Each has insisted on representation and the establishment of small and effective working groups has been slow. It now appears that a system of negotiating groups[28] to deal with "core" issues has taken hold and is bearing fruit. Progress has also been slow because LOSCON deliberately decided at its first procedural session to seek consensus rather than vote. While premature voting would risk the outcome, the consensus rule has allowed delegations to persist with issues known to have little popular support and to be slow in moving ground.

(4) Objectives of LDCs

An assessment of the underlying objects and interests of LDC and whether and how ideology will be translated into action becomes central in determining the likelihood and merits of an international solution.

For some years there has been a bloc of LDC and non-aligned states, largely from Asia, Africa and South America, well known as the "Group of 77". The "77", now some 114 states, is heterogeneous in character, and was drawn together to achieve a redistribution of world economic power. The "77" has been the base for the militance of the third world within the U.N. It has developed a detailed political apparatus within LOSCON and has effectively evolved and applied joint policy. The success of OPEC has no doubt been an influence for cohesion.

The grievances of the "77" have been distilled in the refined and persuasive doctrine of the New International Economic Order. The manifesto for the order is contained in the declaration of Economic Rights and Duties of States.[29] The Declaration, now formally set out in a Charter, is a statement of legal norms originating in UNCTAD[29] debates for the development of international economic relations as a whole on a just and equitable basis. It ranges over many matters including control of foreign investment, the expansion of world trade, co-operation in international economic relations, commodity cartelisation, and raw material price indexation. The real importance of the Charter is in the assertion of political power by LDC.[30] LDC feel they must apply the principles in the Charter — which in fact restates the principles of the "common heritage" — to the seabed.[31]

The political motives of the "77" have been intensified because LDC do not have a significant financial interest in seabed mining. The early support of the "common heritage" principle lay mainly in the expectation of LDC that internationalisation of the oil reserves of the outer continental margins would provide large revenues for redistribution. Now that the whole continental margin will be exploited nationally due to the extension of the continental shelf and exclusive economic zones, only minor[32] manganese nodule mining revenue will come from international waters in the near future.

The political will of LDC has also been reinforced by the technical lead of United States companies. There has been a deep concern that international development would be swamped by private interests because of lack of technology and finance.

Undoubtedly, therefore, the "77" will remain a cohesive and influential bloc in LOSCON, and in any Authority. The "77" will be slow to retract major policy planks even if domestic legislation and permanent loss of a treaty solution were likely. It follows that if LDC do achieve a treaty giving them constitutional control they might seek to damage private commercial interests or to limit them substantially.

4. INTERNATIONAL REGULATION: THE INFORMAL COMPOSITE NEGOTIATING TEXT

The Text is a full charter for the exploitation of all the resources of the seabed in international waters. While it is still formally a negotiating document, it will not be very far from what, if anything, is finally agreed.

(A) The Distribution of Power

The Text establishes an assembly in which all parties to the treaty would be represented and vote equally, a small council responsible to the assembly to exercise day to day control, an economic planning commission to plan for the avoidance of economic damage to land based miners, a rules and regulations commission to fill out the detail of the regulatory structure, a technical commission to plan and supervise mining operations, a seabed chamber to settled disputes and an administrative secretariat. The constitutional whole is known as "the Authority".

(1) The Assembly

The Text, having provided that "the authority is the organisation through which states parties shall organise and control activities in the area"[33] states that the assembly "as the supreme organ of the Authority shall have the power to prescribe the

general policies to be pursued by the authority on any question or matter within the competence of the authority".[34]

In addition the assembly is to have specific powers,[35] including the election of the council[36] assessment of contributions of parties[37] and adoption of rules "for the equitable sharing of . . . benefits derived from activities in the area, taking into particular consideration the interests and the needs of the developing countries".[38]

The assembly is to vote on questions of substance by a two-thirds majority,[39] which leaves the "77" in control. Twenty-five per cent of the members of the assembly may postpone a vote while the opinion of the seabed dispute settlement chamber is sought as to whether the proposed action is in conformity with the convention.[40]

The Text reflects an attempt by developed states to dilute the influence of the assembly by investing the council, which they hope to control, with executive powers. A distinction has been drawn between the power of the assembly to make general policy[41] and the power of the council[42] to regulate day to day activities.

The strategy of the developed states depends on the practical assumption that the executive will dominate. Legally, however, the assembly remains supreme because the council is always required to act in conformity with the policy established by the assembly.[43] Developed states could not really argue that there is a separation of powers.[44] In any event, developed states have not yet achieved any control over council decisions.

(2) The Council

The Text establishes a council dominated by LDC with no minority protections for miners, producers or consumers of seabed minerals.[45]

But the Text does provide the council with substantial day-to-day power so that developed state control would be a significant influence on the working of the Authority.

The council will:

(i) Propose to the assembly candidates for election to the governing board of the Enterprise.[46]

(ii) Supervise and co-ordinate the implementation of the provisions of (the Text).[47]

(iii) Issue directives to the Enterprise.[48]

(iv) Approve after review by the technical commission formal written plans of work (that is, contracts) after review by the technical commission.[49]

(v) Exercise control over activities in the area.[50]

(vi) Submit for approval of the assembly, and implement, the budget of the Authority.[51]

While the Authority (and thus the assembly) is granted "control over activities in the area . . . for the purpose of securing effective compliance with the . . . convention including its annexes and the rules and regulations (made in relation to mining)"[52] it is the council which is to "exercise control over activities in the area in accordance with"[53] the former article.

Lawyers used to orderly domestic statutes will find this jumbled drafting most confusing. On balance, however, while the assembly seems to have final power to control the council, the council appears to have sufficient power to develop a grip of day-to-day affairs sufficient to reduce greatly the "supreme" power of the assembly.

(3) The Commissions

The commissions constitute the third "tier" of decision making organ in the Authority.

The rules and regulations commission is to make detailed rules for exploration and exploitation and recommend them to the council[54] which will approve them[55] provisionally subject to final approval by the assembly.[56]

The function of the economic planning commission is to advise[57] the council in relation to the adoption of a "system for compensation of developing countries which suffer adverse effects on their export earnings or economies resulting from a reduction in price of an affected mineral ... caused by activities in the Area".[58] Recommendations are to be formulated by a two-thirds vote.[59]

The technical commission is to make recommendations to the council in such matters as scientific research and technology transfer[60] and is to advise the rules and regulations commission. Its main function, however, will be to review contract applications[61] and to inspect and supervise mining and exploration.

Thus, responsibility for operations and the formulation of working regulations and price and production control recommendations has moved down to the third tier. The constitution of the commissions is to be relatively neutral. Members are to be appointed by the council but in accordance with professional rather than political considerations. To qualify for appointment to the technical and rules and regulations commissions members must have high technical qualifications which are set out in detail in the Text.

(B) Guarantees Against Discrimination

The only general protection against discrimination in the Text is set out in article 150.2, which provides that:

1. The Authority shall avoid discrimination in the exercise of its powers and functions, including the granting of opportunities for activities in the area;
2. Special consideration for developing countries specifically provided for in this part of the convention shall not be deemed to be discrimination.

(C) Resource Policy

The Text prescribes a range of general policies relating to resource development in the Area, including:

(i) Orderly and safe development and rational management.[62]

(ii) Just, stable and remunerative prices and increasing availability of . . . minerals so as to promote equilibrium between supply and demand.[63]

(iii) Preventing monopolisation of the exploration and exploitation of the resources of the area.[64]

(iv) The protection of developing countries from any adverse effects on their economies or on their earnings resulting from a reduction in the price of an affected mineral to the extent that such reductions are caused by activities in the area.[65]

Specific power is given to the Authority to protect LDC land based producers by limiting production of minerals from nodules in the Area to the projected cumulative growth segment of the world nickel market for the first seven years after 1 January 1980, and thereafter to 60 per cent of that cumulative growth segment;[66] by participating in commodity cartels;[67] and by establishing systems of direct compensation.[68]

While developed states have conceded[69] that seabed production should not exceed some multiple of the projected growth in the world's consumption of nickel, the method of calculation of this growth segment and its practical application to the

granting of contracts and to the treatment of contractors' production has been the subject of lengthy debate and is far from settled. As time goes on the whole concept of the "nickel limit" is appearing more and more difficult and economically illogical[70] but it is so firmly entrenched that it will appear in some form in a treaty.

(D) The Basic Conditions of Exploration and Exploitation

The Text sets out in annex 2 a framework code for the regulation of exploration and mining. This code is to be distinguished from the detailed technical regulations to be formulated by the technical commission. The degree to which the Enterprise will be treated as an equal of states and their companies under this code is unclear in many areas.

Prospecting will be permitted by the Authority after mining companies have undertaken to accept the Authority's regulations, to report on discoveries, and to undertake a training of technical staff of the Enterprise and LDC.[71] However, prospecting will not confer any proprietary rights.

Title to minerals will be acquired by the miner on possession.[72] This is distinct from the common LDCs system of production sharing or service contracting, such as in Indonesia.

Contracts will "confer exclusive rights on a contractor in the contract area"[73] but must "ensure control by the Authority at all stages of operations".[74]

The area in relation to which a contract application is made must be of a size and grade sufficient to allow two commercial operations, of which an area sufficient to support one operation is to be dedicated by the applicant, free of cost, for development by the Enterprise or LDC.[75] This contribution of exploration and feasibility study costs by applicants is known as the "banking system" by means of which LDC believe that the effective launching of the Enterprise will be assured. This system has also been conceded by developed states and industry.

At the time of this dedication, the applicant must make available, for use by the Enterprise on the "banked" portion of the area under application, the technology to be used by the applicant in the exploitation of the remaining portion, on fair and reasonable terms and in default of agreement on a basis to be fixed by arbitration.[76] This transfer system seems likely to lead to unreasonably low returns to contractors and the rapid elimination of their competitive leads. The principle of transfer is accepted by developed states, but the mechanics are strongly disputed.

The Authority will consider applications for exploitation contracts every four months.[77] All applications received during each four month period — a very long time in exploration terms — are to be regarded *prima facie* as having equal priority where claims overlap or where the "nickel limit" means that not all applicants can succeed. The Authority has the power to choose between competing applications and is required to give preference to applicants which indicate a preference for joint ventures with the Enterprise.[78] This is a means by which contractors could be forced to do business with the Enterprise or LDC or by which the Authority could sanction LDC "claim jumping".

If a contract application is uncontested, then the Authority shall without delay "enter into negotiations with the applicant with a view to concluding a contract",[79] and "as soon as the issues under negotiation have been settled, the Authority shall conclude the contract".[80] This cannot be regarded as any form of "assurance" of access — that is, based on objective qualifications.

Provision is made for inclusion of a quota system[81] for contracting, intended to

avoid monopolisation of seabed mining by any single state, and in particular by the United States.

The Basic Conditions are not all gloom for contractors. The Authority is required to "accord the contractor the exclusive right to explore and exploit the area".[82] Also, "a contractor's rights may be suspended or terminated only . . . if the contractor (has committed) gross and persistent or serious, persistent and wilful violation of the fundamental terms of the contract"[83] and except in emergencies, "the authority may not execute a decision involving monetary penalties, suspension or termination" until the contractor has exhausted his judicial remedies in the seabed dispute chamber.[84]

The Basic Conditions attempt[85] to establish financial terms of contracts. Whilst no exact figures or percentages have yet been agreed, it seems accepted that contributions by contractors will be based on a combination of an initial contract fee, fixed annual charges, royalties based on the market value of production, and a share of profits fixed in ranges determined according to the miner's per annum rate of return on capital, calculated after deducting development and operating costs and depreciation.

(E) Dispute Settlement

The Text provides compulsory settlement of disputes among the Authority, the Enterprise, states and contractors in the seabed chamber of the Law of the Sea Tribunal to be established for the purposes of the treaty as a whole.[86]

While the dispute settlement articles show much agreement between developed and developing states and are of potentially great stabilising value, they present some major problems. Appointments may be made on a political basis. As parties may arbitrate rather than sue before a judicial tribunal[87] a uniform and predictable body of law and practice may not be developed.

Most importantly, the jurisdiction of the Chamber — which seems comprehensive at first sight — is in fact severely limited.

The Text provides[88] that the Chamber shall not judge whether any rules, regulations or procedures adopted by the council or assembly are generally in conformity with the treaty, but shall restrict itself to individual cases. Further, the Chamber "shall have no jurisdiction with regard to the exercise by the Assembly or the Council . . . of their discretionary powers . . ." Many powers of greatest importance to investors (for example, decisions as to contractors' qualifications or the enforcement of resource policy) would probably be regarded as discretionary. The classification of powers is bound to produce a major legal problem for the chamber.

(F) The Secretariat

A Secretary General is to be appointed as the chief administrative officer of the Authority by the assembly on the recommendation of the council.[89] While the Secretary General will perform functions entrusted to him by other organs of the Authority, it is not clear whether the administration of all organs will in fact be integrated, although that would be common sense. The Secretary General will appoint his own staff on the basis of competence and geographical representation but on terms conforming with policy and regulations laid down by the assembly and council.[90] The apolitical nature of appointments to the secretariat staff and the duties of such staff to act disinterestedly[91] may significantly influence the practical running of the Authority, as it does in the United Nations specialised agencies.

(G) The Enterprise

A separate international legal person, the "Enterprise", is established by the Text as the organ of the Authority to explore and mine the Area, subject to the general policy directives and control of the council.[92] The Enterprise has its own statute[93] and will be governed by a Board of 36 members elected by the assembly in accordance with the conditions governing elections to the council. Council members will probably double as Enterprise board members. If the Enterprise does compete in the Area with contractors, it will be preferred to contractors in many ways. It pays no tax or royalties; it is assured of financing, is relieved of exploration expenses through the operation of the "banking" system, may receive cheap technology and may not be subject to production limits. Furthermore, the Text does not protect contractors dealing with the Enterprise. There is a chance that, for example, if joint venturing with the Enterprise is a condition of access, part of the Enterprise interest will have to be carried by the contractor.

(H) Preferences to LDC

The power of the Authority to cure adverse effects on LDC with land mines for nickel, cobalt, copper and manganese has been mentioned. There is a more general concept of LDC preference underlying the Text, incorporated in the Text's "foundation" articles.[94] This preference is to be given to LDCs by redistributing mining income and in enabling LDCs to mine rather than developed states or their companies. Developed states accept that income collected by the Authority from contractors or generated by the Enterprise may be distributed to LDC for development purposes. The assembly is to make decisions as to the allocation of this income.[95] Further,

> Effective participation in the activities of the area of developing countries shall be promoted . . . having due regard to their special needs and interests . . .[96]

As has been seen, scope exists in the Basic Conditions and elsewhere in the Text for the Authority, in negotiating contracts and in determining the priority of applications for mine sites, to ensure that LDC interests in mining and in acquiring technology are served.

(I) The Review Period

The Text provides that twenty years after entry into force of the treaty, a review conference shall be held to discuss whether the treaty has operated in accordance with its stated aims, particularly with regard to LDC preference, resource policy and monopolisation. The conference is authorized to recommend necessary amendments to the treaty for adoption by member states, but is not permitted to interfere with investments then in place. If agreement is not reached on any proposed amendment within five years after the conference is convened, state and private access is automatically to be terminated except where it is in the form of joint ventures with the Enterprise.

5. ISSUES UNRESOLVED BY LOSCON

(A) The current issues can be described as follows:

(1) Access: Who Shall Exploit the Area?

A shared mining system — that is one in which the Area is exploited both by

the Authority and by states and states' companies — has been conceded by all developed states. Although other systems have been looked at — in particular a European[97] suggestion that the system be unitary, based on joint ventures — it seems unlikely the sharing concept will be replaced. The issue is the degree to which access from the state and private side is "assured".[98] The Text is rightly thought by developed states not to give a reasonable assurance since it grants full discretion to the Authority to conclude contracts. It is however accepted that the Authority will need some regulatory power to bar unqualified applicants and to regulate mining safety and other similar standards.

(2) Control of the Authority

Attempts to divide the powers of the assembly and council have not been successful. It will always be open to the assembly to exercise its "supremacy", which LDC will never give up. The question now is whether developed states will obtain a veto in the council sufficient to protect their essential interests.

(3) Regulatory Power of the Authority

Contractors must accept that the authority will have very wide regulatory power. The issue here again is the degree to which guarantees of non-discrimination should be put in the Text.

(4) Resource Policy

The Text will contain provisions of some kind attempting to limit production so as to protect the position of LDC land based producers. It seems that a formula satisfactory for industry and LDC will eventually be agreed.

(5) Revenue Sharing

The financial terms of contracts have been extensively and unsuccessfully discussed. Industry is itself divided as to the preferred approach, partly because states may differ in tax treatment of the various revenue components — royalty, tax, super tax and front end payments — and partly because the economics of the mining ventures themselves are untested.

(6) The Position of the Enterprise

The Text confers substantial competitive advantages on the Enterprise. The question is the degree of advantage which should be allowed. Developed states generally wish to see this advantage reduced, or at least specified more clearly.

(7) Quotas

The developed states disagree as to whether any particular state should have its access or that of its nationals limited.

(8) Technology Transfer

Disagreement exists as to the point at which transfer should take place, the price to be paid and the means of fixing the price, but not as to the principle.

(9) Dispute Settlement

The Text seems to put many vital decisions of the assembly beyond the jurisdiction of the seabed chamber. Developed states insist that actions of all arms of the Authority on all matters should be reviewable for compliance with the treaty.

(10) The Review Period

The Text currently envisages exclusion of state and private mining after twenty-five years. LDC have now agreed that until a new regime is settled, there should be a moratorium on the issue of new contracts rather than automatic exclusion of state and private exploitation. Developed states would prefer that the existing system continue until replaced by some other system universally agreed.

(11) Financing Problems

No allowance seems to have been made in the Text or in the Basic Conditions for the application of orthodox securities mechanisms — the giving of securities over contracts, contract areas, or cash flows. Mechanics allowing the grant of such rights to financiers, and enabling exercise for example of rights of foreclosure or receivership of operations under contracts, will be necessary before funds are lent on a project finance basis. Until then they will presumably only be lent on a security over the general assets of consortium members.

(B) Implications of the Text for Industry

If unchanged, the Text would present many problems for investors and bankers measured against the orthodox investment requirements noted earlier.

Hard won technology could become available to the Enterprise and through it to LDC and other companies joint venturing with the Enterprise at heavily discounted prices.

Seabed mining ventures might be non-bankable except by the placement of general corporate assets at risk.

Joint ventures with the Enterprise or with LDC could be marginal or deteriorate unpredictably.

Production limitations might exclude mining companies from a second investment as the remaining part of the "nickel limit" might be reserved for LDC and the Enterprise. Second projects are now regarded as essential to recoup research and development costs fully and to produce a good average rate of return.

Limitations of the system of judicial review could seriously weaken security of tenure.

Governments could not be relied on to protect investments against discriminatory action by LDC majorities as the assembly and council would be controlled by LDC.

Concentration of mining in the hands of the Enterprise might over time establish an LDC cartel controlling production and sale of a substantial percentage of world production of copper, nickel, manganese and cobalt. The Authority would not be answerable under national anti-trust laws for market manipulation.

If a joint venture system were enforced processing facilities could be located in LDC with increased risks of intervention.

The cumbersome machinery envisaged by the Text might never work.

The lead time involved in achieving an agreed number of treaty ratifications,

establishing the Authority and all the appropriate rules and regulations would not be completed until at least 1985, meaning that critical development programs could be stalled indefinitely.

All of the above mean that expenditure on engineering, research and development and further mine site evaluation could be deterred unless some other form of investor protection is available.

6. DOMESTIC LEGISLATION

(A) Developments in the United States

With the unpromising state of the international negotiation, United States mining companies have been lobbying hard for some years to secure a domestic act to provide a stable and secure base on which to proceed with development and mining.

Miners have been helped by a trend in the United States Congress against reaching agreement with LDC on seabed mining on anything like the basis in the Text.[99] This reluctance has sprung from a growing Congressional awareness of the precedental effect of LOSCON solutions from a global "north-south" viewpoint; of the extreme strategic dependence of the United States on imports of some minerals which are to be mined from the seabed — for example manganese, which is not found in the United States at all[100] — and from a reaction to OPEC pricing and recent failures of United States foreign policy in Africa and the Middle East.

Several House and Senate bills have been put up over the last seven years but none made progress until the United States administration decided in principle to support the legislative effort. In the summer of 1978 the House bill, HR3350, was favourably reported out of all committees and was passed. The Senate bill, S.2053, was also favourably reported and would have been passed had it reached the floor. Because of the final deluge of other legislative business before the October adjournment a few opposing Senators were able to keep it out.

Almost identical bills were reintroduced in the Senate — S493 — on 26 February of this year and in the House — HR2759 — on 8 March. Committee hearings[101] have already begun. The administration has again supported the bills[102] and they are widely expected to pass both Senate and House this summer.

The basics of the bills are simple. The Senate bill will be referred to for convenience.

The bill is interim in that it contemplates that a LOSCON treaty will replace it, and disclaims sovereign rights to seabed resources.[103] It reaffirms the commitment of the United States to a reasonable and effective LOSCON treaty, but justifies the authorisation of exploration and mining as a well-recognised exercise by United States citizens of the freedom of the high seas.[104]

No United States citizen may engage in the exploration for or exploitation of manganese nodules on the international seabed without permission of the Federal Government probably in the person of the new Department of Natural Resources to be established soon by the Carter administration.[105] Permits will only be given to qualified applicants with priority in time.

A "United States citizen" is defined[106] to include "any corporation . . . organised . . . under the laws of any of the United States" and "any corporation . . . if the controlling interest in such entity is held by a (United States corporation)". This would appear to include a United States corporation whatever its ownership. All the

current consortia could presumably incorporate in the United States and be protected — and regulated — by the bill.

Issuance of permits for exploitation may not take place until 1 January 1981. Issuance of licences for exploration is not so limited. Licences and permits will limit the area to be explored or mined and the period of authorization and will contain detailed provisions to protect the marine environment and encourage safety.[107]

The bill enjoins United States citizens from interfering with the activities of holders of licences or permits of any "reciprocating State", so designated by the Secretary of State on his determination[108] that the state regulates deep seabed mining by its citizens in an acceptable way and recognises the priority of the United States licencees and permittees.

The bill attempts to protect investments made by licencees and permittees by including[109] language urging the United States negotiators at LOSCON to ensure that any treaty agreed upon should provide assured and non-discriminatory access on reasonable terms and conditions, and should allow[110] United States citizens who commence activities under United States licences or permits prior to convention to continue their operations under the same terms and conditions as set down in the bill. The bill also provides[111] that in relation to any convention entering into force with respect to the United States, necessary measures shall be taken to ensure, consistent with such agreement, that existing United States investments are protected.

These provisions, amounting to a moral obligation to protect investments, have become known as the "grandfather" clauses. They have been reluctantly[112] accepted in principle by industry in substitution for earlier outright investment guarantees.[113]

The bill requires[114] that the mining vessel and at least one transportation vessel used under United States permits will be United States flag vessels, requiring compliance with United States maritime legislation and subject to the jurisdiction of United States maritime unions in relation to manning and conditions. These provisions have been correctly attacked by the industry and the United States administration as chauvinistic and costly. It seems unfair and unwise for the United States to exclude vessels flying flags of foreign partners of United States companies. Reciprocal action to exclude United States vessels for example from offshore petroleum exploration and exploitation could be expected.

The bills[115] require all nodules to be processed in the United States or aboard United States flag vessels except where a permittee shows that this could seriously damage project viability. This requirement has been found equally objectionable by industry and the United States administration.

The bill establishes a tax on seabed mining at an annual rate of .75 per cent of fair market value of minerals produced during the year. The proceeds will be placed in a fund[116] to be appropriated as provided by Congress including towards payment of obligations of the United States under a LOSCON treaty.

The bill encourages[117] the successful negotiation of a comprehensive law of the sea treaty to regulate deep seabed mining and to give legal meaning to the "common heritage" principle.

(B) Developments in West Germany

In December 1978 a group of 123 members of the Bundestag introduced a bill[118] for the interim authorization of deep seabed mining. The introducing group is

thought to include a wide cross section of party opinion and interests and is thought to have a good chance of passage.

The German bill is very similar in effect to the United States bills although much simpler, and does not contain any sign of intervention by maritime lobbies.

The bill clearly states as its purposes the prevention of uncontrolled claims and exploitation, the continued development of technology and the protection of the interests of LDC.

Exploration and mining by "residents" of the Federal Republic of Germany (FRG) is prohibited[119] unless authorized by the FRG or a reciprocating state.[120] "Residents" are natural persons who are FRG citizens or FRG corporations wholly-owned and controlled by FRG Citizens.[121]

The bill is justified as an exercise of high seas freedoms. The bill describes itself as transitional.[122]

Exploration and exploitation require separate authorizations of the Federal Minister for Economics[123] which will be granted only in the absence of a treaty binding FRG, to duly qualified applicants having priority in time and where the grant would not prejudice exercise by others of high seas freedoms, the environment or FRG foreign relations.

A system of reciprocity similar to that in the United States bills is provided.[124]

FRG has wide powers to regulate mining activities and to amend the terms of authorisations.[125]

An annual mining fee of .75 per cent of "average market price" for extracted metal is payable.[126]

A trust fund is to be established for mining fees to be used "for development aid purposes".[127]

Holders of authorisations will receive full compensation for financial loss arising as a result of accession by FRG to a LOSCON treaty, but not after 10 years of operations.[128] Where non-residents participate in a consortium company which has received an authorisation, only residents may claim, to the extent of their loss.[129]

There is no base date before which permits may not be issued.

(C) Other

Other members of the EEC and Japan are studying various forms of domestic legislation, but none has yet been advanced as a bill.

(D) Difficulties Presented by a System of Domestic Reciprocation

Domestic systems will be little use to miners without assurance that each authorising state will reciprocate with each other such state, and that reciprocations will be permanent. There can be no assurance that this will be the case. FRG, for example, has indicated that it may not grant the United States reciprocating status unless United States flag protections and processing obligations are dropped.[130]

A reciprocal system will also find it difficult to deal with large claims made by states to "reserve" seabed areas for future use rather than to develop them. The current bills do not attempt to distinguish these two kinds of claims other than by providing for the removal of reciprocating status.

Such a system will have to develop a more refined means of allocating priority between claims. The recognition of equivalent mining authorisations only may produce inequity.

Difficulties will arise in the treatment by various states of conditions of award and continuation of rights. Reciprocating states may agree that rights should be awarded on the basis of certain qualifications or lapse for non-activity, but may differ substantially as to what qualifications or degree of activity is appropriate in each case.

Miners may also find their programs halted for long periods while states conclude negotiations over priorities, or as a result of intervention by aggrieved LDC.

Finally, differences between various systems may lead to "jurisdiction" shopping, splits in consortia and poor overall resource management. For example, states may find it difficult to agree on precise environmental and technical regulations. The bills offer different degrees of investment protection and will come into effect at different times. The bills provide for the negotiation and establishment of international agreements to overcome these problems, but doubtless these would be difficult and time-consuming to achieve.

7. CONCLUSIONS

It would seem at first sight that it may take many more years to agree on any form of legal regime — national or international — satisfactory for investment of the massive sums needed. Indeed it might appear a permanently hopeless cause, with LOSCON deadlocked on the one hand, and states unable to agree on a broad system of regulation and reciprocity on the other. Moreover, viewed conventionally, even the best treaty achievable by the most interested developed states would be full of risks for investors with an ambiguous and complicated charter, a potentially hostile majority, an unwieldy and possibly inexpert bureaucracy and a heavily preferred competitor in the Enterprise.

No doubt agreement at LOSCON will take more time. There are indications, however,[131] that despite some regressions, especially in relation to resource policy and financial conditions[132] the negotiating process may at last be drawing to a close. Governments appear to have concluded that the basic structure of the present negotiating text has such inertia that it cannot be changed greatly without serious or total disruption to the process. It is speculated that the United States, FRG and Japan believe it is necessary to conclude agreement within the next two sessions, and will be satisfied with what interests currently say are marginal improvements to the Text. These countries evidently believe their industries will be able to adapt successfully to the administration of the Authority, constituted much as at present, as long as LDC will grant reasonable assurances of access and non-discrimination. The worth of the convention overall is seen as greater than the risk that miners will not adapt as they have done in other investment contexts.

The real purposes and likely impact of domestic legislation are difficult to assess.

Developed states, particularly the United States, have always claimed[133] that under existing international law the resources of the deep seabed, being "res nullius" may be appropriated under the doctrine of the freedom of the high seas. The United States and German bills expressly justify themselves as legitimate exercises of this freedom. The bills renounce sovereign claims to deep seabed mining resources.

The United States and FRG deny that the "common heritage" principle established in the "Moratorium" and "Principles" resolutions of the U.N. are violated by their bills. They say those declarations do not constitute international law and would in any event be observed in the passage of the bills because of the absence of sovereign claims, because the common heritage implies free and non-discriminatory

access to all states and because funds to be derived from mining are partly to be appropriated for the benefit of LDC.

These explanations seem a thin rationalisation of the desire of these two developed countries to pursue their economic interests and a moral violation of the U.N. resolutions. The purpose of interlocking domestic regulatory systems is obviously to establish precisely what current international law cannot now provide — security of tenure.

It may well be that the U.N. resolutions are declaratory of customary international law for the seabed. LDC are now conferring with international lawyers to establish whether this could be so. The behaviour of developed states in showing so many years of restraint will certainly tend to weaken their positions.

There is no doubt, therefore, that passage of domestic bills would be branded by LDC as illegal, and that it could jeopardise the convention.

In supporting the domestic bills now being canvassed, especially the United States model, industry seems to be willing to make large sacrifices in accepting a strict regulatory system and the establishment of only a moral obligation on the part of the United States negotiators at LOSCON to attempt to protect investments on a transition.

It is unlikely that any mining company would actually invest the $US1 to 1.4 billion needed for mining on the basis for example of the United States bill alone. The problems of a domestic system of reciprocation, possible LDC intervention and relatively uncertain investment protections appear too great. However, the United States bill would probably be enough assurance to allow development programs to continue. The United States led consortia seem to have decided that only a reasonable and comprehensive international treaty will attract the necessary financial commitment from banks and that the best chance of guaranteeing a reasonable treaty is by means of "grandfathering" instructions to negotiators, which unless complied with would make ratification of a treaty by the United States Senate a remote possibility, especially if investments had already been made.

The United States and FRG administrations support their bills in the apparent belief that it will be possible to negotiate a treaty which will either protect prior investments or come into effect before investments are made, and that failure to do so would be contrary to their national interest. They must also believe that the passage of bills will encourage LDC delegations at LOSCON to make the final compromises necessary for a fair treaty. But it is a great gamble to assume that this will have the effect of producing final compromises rather than breakdown.

Another unknown is whether the United States Senate will, in fact, ratify a treaty even if the Text is improved to the point sought by United States negotiators. If it is submitted before any major investment has taken place then there seems a reasonable chance. This time the United States negotiators are gambling heavily. The Senate could easily baulk because of the strategic importance of minerals involved, the problem of north-south relations, and Jimmy Carter's depletion of congressional credit as a result of ratification of the Panama Canal Treaty and, presumably, Salt II.

One can only hope that the players in this game of international brinkmanship have calculated the odds correctly.

The ultimate question in this equation is how industry will respond to the kind of regime contemplated by the Text, given that only minor improvements now seem likely.

The fact is that the commercial consortia are the only ones who can give

substance to LDC political ambitions by exploiting the Area. It seems unlikely therefore that LDC would wish to crush private participation from the beginning. International "realpolitik" will also not be lost on LDC. The reverberations for them in other economic and political arenas of unreasonably damaging state or private interests would probably be unacceptable. And so one can easily see a sustained period of dominant and trouble free participation on the international seabed for private interests especially when LDC recognise the economic advantages of efficient private exploitation.

However much the United States or any other state struggles at LOSCON, it will not secure agreement on a structure which ensures that under no circumstances will a determined majority have power to damage contractors' interests. This is guaranteed by the historical and political force of the common heritage principle and sovereign pride. Not even a favourable constitutional agreement, especially in vague treaty language, can itself produce goodwill. The life and force of an international seabed administration will depend on evolution, not textual nuance. The question, at bottom, is whether miners believe it possible to fashion a pragmatic understanding with the Third World.

Miners are already heavily committed both financially and philosophically to the pioneering of this new resource. They seem to be willing to accept high risks. The fascinating question that may determine the whole future of the international seabed industry is how miners will respond to the unique value choices they face. The writer is confident that world needs will compel seabed mining, and that industrial state miners will find ways to adapt to and profit from an international administration — substantially in the form produced at LOSCON.

FOOTNOTES

* The views expressed in this paper are entirely those of the author made in a personal capacity and should not be taken to express the views of C.R.A. or any of its subsidiary or associated companies.

1. The sources of technical literature dealing with nodules are too numerous to cite. For bibliographies, see Hubred, Deep Sea Manganese Nodules — A Review of the Literature, Min. Sci. & Eng., Vol. 7, No. 1 (Jan. 1975); Glasby, Selected Bibliography of Marine Manganese Nodules, New Zealand Oceanographic Institute Records, Vol. 1, 1-35 (1972); Seabed Mining — background and current outlook — Systems, Methods, World Mining, Vol. 30 (Dec. 1977).
2. The first and second conferences were held in Geneva in 1958 and 1960 respectively, and resulted in four conventions, (High Seas, Territorial Sea and Contiguous Zone, Continental Shelf and Fishing & Conservation of the Living Resources of the High Seas). All are now in force. See generally, Dean, The Geneva Conference on the Law of the Sea: What Was Accomplished, 52 Am. J. Int'l L. 607 (1958).
3. *Infra*, n. 19 and n. 20.
4. Despite the extended LOSCON debate on mining, there is no indication that any of the U.K., France or the Soviet Union would wish to be part of such an arrangement at the present time. See, also, Hearings on H.R. 1270, 6017 & 11879 before the Subcomm. on Oceanography of the House Committee on Merchant Marine and Fisheries, 94th Cong., 2d Sess. (1976) (Statement of Marne A. Dubs).
5. For an excellent survey of the Modern Continental Shelf doctrine, see Bentham, The Concept of a Continental Shelf and Problems of Exploitation, The Law of the Sea and Natural Resources, 1976.
6. Informal Composite Negotiating Text (ICNT) of the Third United Nations Conference on the Law of the Sea, Article 76.
7. ICNT, Part V.
8. Bentham, *op. cit.*, *supra*, n. 5, 66.

9. *Infra*, Part V.
10. As at 30 April 1979 the Consortia are as follows:

	Per cent
Kennecott Copper Corp. (U.S.)	50
Noranda (Canada)	10
Consolidated Gold Fields (United Kingdom)	10
Rio Tinto Zinc (United Kingdom)	10
British Petroleum (United Kingdom)	10
Mitsubishi (Japan)	10
Ocean Mining Associates	
Essex Minerals Co. (a corporation owned by United States Steel Corp. (U.S.))	33 1/3
Union Seas, Inc. (a U.S. corporation owned by Union Miniere, S.A., (Belgium))	33 1/3
Sun Ocean Ventures, Inc. (a U.S. corporation owned by Sun Co., Inc. (U.S.))	33 1/3
Deepsea Ventures, Inc. (a U.S. corporation and service contractor to Ocean Mining Associates)	
Ocean Minerals Company	
Lockheed Missiles & Space Co., Inc. (U.S.)	
AMOCO Minerals Co. (U.S.)	
Billiton International Metals, B.V. (Netherlands)	
Bos Kalis Westminister Dredging (Netherlands)	
(Participation percentages not publicly available)	
Ocean Management Inc.	
INCO, Ltd. (Canada)	25
SEDCO, Inc. (U.S.)	25
AMR Group (West Germany)	25
Preussag AG	25
Metallgesellschaft AG	
Salzgitter AG	
DOMCO Group (led by Sumitomo of Japan)	25
Afernod (France)	
CNEXO	
CEA	
BRGN	
Le Nickel	
France-Dunkirk	
(Participation percentages not publicly available)	

11. Massachusetts Institute of Technology, *Study of Economics of Production from a Deep Seabed Area*, January 1979.
12. See, e.g., Goldie, Mining Rights and the General International Law regime of the Deep Ocean Floor, 2 Bklyn. J. Int'l. L. (1975); Biggs, Deep Seas Adventures: Grotius Revisited, 9 Int'l. Law. 271 (1975); Laylin, The Law to Govern Deep Sea Mining Until Superseded by International Agreement, 10 San Diego L. Rev. 433 (1973); Frank & Jennett, Murky Waters: Private Claims to Deep Ocean Seabed Minerals, 11 Law & Pol. in Int. Bus. 1237 (1975); Laylin, Past, Present and Future Development of the Customary International Law of the Sea and Deep Seabed, 6 Int'l. Law. 42 (1975).
13. On 15 November 1974 Deep Seabed Ventures, Inc. filed with the State Department and with governments and mining companies around the world a notice of discovery, a claim of exclusive mining rights and a request for official protection for operations in an area of 60,000 square kilometres on the Pacific Ocean floor between Hawaii and California. The claim stated that production would begin within fifteen years and continue for forty years. It was intended to fix the priority of Deep Sea Ventures over the site, to notify the U.S. government of its readiness to mine, and to substantiate and reinforce the assertion that customary international law permitted the exclusive claim by occupation and use of surveyed submarine areas for mineral exploitation.
14. *Supra*, n. 2.
15. See U.S. Dept. of State Press Release No. 49 (Feb. 18, 1970). The Peruvian claim, typical of the Latin extensions, was contained in Supreme Decree No. 781, August 1, 1947, (1947)

El Peruano No. 1983 at 1 (Peru). For an English translation see 1 U.N. Secretariat, Laws and Regulations on the Regime of the High Seas 16 (EST/LEG/SER.B/1, 1951).

16. Confrontations had already developed between coastal states and distant water fishing fleets in Latin America in particular. Disputes between U.S. tuna fishermen and the Peruvian Government over the extent of that nation's territorial waters attracted wide attention in the 1970s. An Icelandic assertion in 1973 of exclusive fisheries jurisdiction to a distance of 50 nautical miles from its coast resulted in intense antagonism between Iceland and other countries, particularly the United Kingdom, whose nationals traditionally had fished in the affected areas.
17. 22 U.N. GAOR Annexes, Agenda Item No. 92, at 1-2, U.N. Doc. A/6695 (1967). Ambassador Pardo of Malta proposed the resolution after a celebrated three hour speech which essentially took the "internationalist" approach.
18. See, G.A. Res. 2340, 22 U.N. GAOR Supp. 151, at 14-15, U.N.
19. 6.A.Res. 2574D, 24th General Assembly.
20. 6.A.Res. 2749, 25th General Assembly.
21. The resolutions had no legally binding effect under the United Nations Charter on the United States or any other member of the General Assembly. The powers of the General Assembly are set out in Articles 10-17 of the United Nations Charter. These powers do not include the legislative authority to enact rules of international law. A proposal to give the General Assembly such authority was expressly rejected at the San Francisco Conference of 1945. Hence, resolutions of the General Assembly are recommendatory, not obligatory. The United States Government has consistently denied that the resolutions have any binding legal force. Whether the resolutions can now be regarded as declaratory of customary law is another, more difficult, issue. Of the moral force of the Declarations there is no doubt. Even the United States in the late 1960s seemed fully committed to the internationalization process. In 1966, President Johnson, in a highly publicised address made at the commissioning of the research vessel "Oceanographer", declared that the mineral resources of the seabed should not be the subject of any territorial annexation by states. President Nixon in 1970 was responsible for the proposal by the U.S. of a full draft Law of the Sea treaty which would effectively have ceded to the international community all sea and seabed resources beyond the 200 metre isobath. This was an unexpected and glavanic initiative, and one from which the U.S. policymakers appear to have been retreating since.
22. G.A. Res. 2750C, 25 U.N. GAOR Supp. 28 at 26, U.N. Doc. A/8028 (1970). In 1972 the General Assembly called for an organizational session to be held in late 1973 — which convened on schedule — and for a substantive session to take place in 1974. G.A. Res 3029A, 27 U.N. GAOR Supp. 30 at 21 U.N. Doc. A/8730 (1972).
23. For results of the work of the Preparatory Committee, see 27 U.N. GAOR Supp. 21 at 5-8, U.N. Doc. A/8721 (1972). The six-volume final report of the Committee includes the areas of agreement and disagreement with respect to the status, scope and basic provisions of the regime for the international seabed area and the status, scope, functions, and powers of the international machinery; the text of draft articles on a wide range of topics submitted by individual delegates, groups of delegates and regional conferences; a compilation of variations; comparative tables; and a consolidated text. 28 U.N. GAOR Supp. 21, vols. I-VI, U.N. Doc. A/9021 (1973).
24. G.A. Res. 3067, in U.N. Press Release GA/4940, Dec. 19, 1973.
25. U.N. Doc. A/AC. 138/SR.72 at 17 (1973).
26. The difference can be illustrated by a comparison of the following views. The first was contained in a paper delivered in 1973 by the Venezuelan delegate to LOSCON, Andres Aguilar, when he said:

    > To developing nations, the concept of the common heritage implies not only sharing in the benefits to be obtained from exploitation of the resources of the area, but also, *and above all*, an effective and total participation in all aspects of the management of this common heritage. (Emphasis added).

    Aguilar, *How Will the Future Deep Seabed Regime be Organized? Law Of The Sea: The Emerging Regime Of The Oceans* (Gamble & Pontecorvo, eds.) 1974.

    President Echeverria of Mexico at the Caracas Session of LOSCON said:

    > The granting of concessions to states, or worse, to private, probably transnational corporations, for the exploitation of ocean resources, would be the equivalent of permitting the distribution and occupation of vast underwater territories by a few countries, thereby creating a new form of colonialism for the benefit of the more

technologically and financially advanced countries and converting what is supposed to be common patrimony into a profitable business for a privileged few.

Delivered at the Law of the Sea Conference, Caracas Session, July 26, 1974.

Contrast the remarks of Professor Goldie, a legal adviser to Deep Sea Ventures. He attacked the notion that the Declaration of Principles meant the characterization of the mineral resources of the seabed as an estate held in common by all humanity, saying:

It cannot be argued that the "common heritage" . . . automatically or immediately creates an international condominium in the resources of the deep seabed. Such a change . . . could be accomplished only by a dispositive treaty with similar effect in international law as that of a . . . conveyance in domestic law. The formal signature of all states would be required for such an important quitclaim.

Goldie, *op. cit., supra* n. 12.

27. Daniel Moynihan consistently articulated these fears while United States Ambassador to the United Nations. In his celebrated article, The United States in Opposition, Commentary Magazine (March 31, 1975), Moynihan popularized the anti-development and particularly anti-United States bias of most LDC and proposed that developed states should abandon appeasement in favor of a quiet but determined stand on issues of significance. Ambassador Scali of the United States also was a critic of LDC tactics in the United Nations. He furiously attacked the Charter of Economic Rights and Duties of States as a large contribution to international confrontation. See, e.g., U.N. Doc. A/PV/2229 (1974), reprinted in 70 Dept. of State Bull. 569 (1974). The Group of 77 has been especially effective in the United Nations General Assembly in controlling certain political decisions as, for example, the suspension of South Africa from the General Assembly. See, Approval of the Report of the Credentials Committee, 29 U.N. GAOR Annexes Agenda Item 3 (Doc. A/9779) at 2 (1974). But see Sohn, United Nations Decision making: Confrontation or Consensus? 15 Harv. Int'l. L.J. 438 (1975) in which the author questions the common assumption that LDC often vote destructively. He says:

A closer look at United Nations records makes it quite clear, then, that despite verbal pyrotechnics, often emphasized by the information media, the work of the United Nations proceeds quite smoothly, most decisions being adopted by unanimity or quasi-unanimity. Consensus has in fact replaced confrontation.

Id., at 444.

The expropriation experience of the United States and others in Latin America and the Middle East has also no doubt been a factor.

28. A system of negotiating groups to deal with "core" issues was established for the intersessional LOSCON discussions held at Geneva in January, 1979. The same groups were re-established at the recently concluded eighth LOSCON session.

29. G.A. Res. 3281 (XXIX) of Dec. 12, 1974, adopted without vote on the recommendation of the Second Committee. The text is reproduced in 14 Int'l. Leg. Materials 251 (1975). See, e.g., White, A New International Economic Order, 24 Int'l. & Comp. L.Q. 543 (July 1975); Rozental, The Charter of Economic Rights and Duties of States and the New International Economic Order 16 Va. J. Int'l. L. 309 (1976).

30. The Charter of Economic Rights and Duties of States had its genesis in a proposal of President Echeverria of Mexico at UNCTAD 3 at Santiago in 1972, and was heavily influenced by the contributions of Latin American diplomats at that time. The two outstanding figures at LOSCON who were so involved are Andres Aguilar and George Castaneda, LOSCON representatives for Venezuela and Mexico respectively. The Latin American states had previously evolved an ideological and juridical approach to economic rights, which found its ultimate expression in the theory of "dependency", which in turn was systematically applied in the regional Association of South American States known as the Andean Group, established pursuant to the Agreement of Cartagena in 1969.

31. It was at the 1975 Geneva session of LOSCON that the principles of the New International Economic Order were concertedly applied to the seabed debate. The main advocates were the "77" radicals, Algeria, Mauritania and Tanzania, and the Latins. See generally, Miles, An Interpretation of the Geneva Proceedings — Part 1, 1 Ocean Development & Int'l L. 11 (1975). Art. 29 of the Charter of Economic Rights and Duties of States declares that the Area is the common heritage of mankind, and requires that any exploitation of the Area should take into account the particular needs and interests of the developing nations. It goes on to provide that "An international regime applying to the Area and its resources . . . and

including appropriate international machinery to give effect to its provisions shall be established by an international treaty of a universal character, generally agreed upon."

32. See, e.g., Report of the Secretary General on the Effect of Different National Boundaries on the Distribution of Mineral and Hydrocarbon Resources, U.N. Doc. A/AC.138/87 (1973); Branco, The Tax Revenue Potential of Manganese Nodules, 1 Ocean Devel. & Int'l. L.J. 201, 208 (1973).
33. Text, Article 155. "Activities in the Area" are defined in the Text by Article 133 to include ". . . all activities of exploration for, or exploitation of, the resources of the area."
34. Text, Article 158.1.
35. *Id.*, Article 158.2.
36. *Id.*, Article 158.2(i).
37. *Id.*, Article 158.2(vi).
38. *Id.*, Article 158.2(xii).
39. *Id.*, Article 157.6.
40. *Id.*, Article 157.10.
41. *Id.*, Article 158.1.
42. *Id.*, Article 160.1.
43. *Id.*, Article 160.1
44. As a matter of interpretation, treaties are dealt with in the same way as statutory instruments at common law. The plain meaning of the text is to be elucidated before there can be any question of the admission of "intentions", much less "travaux preparatoires". Therefore, however much it may have been acknowledged in debates that effective power over operations will reside in the Council, if the Text indicates clearly (as it does) that supreme power remains in the Assembly, that is that.
45. The council is to consist (Text, Article 159) of 36 state members made up of:
four from countries which have made "the greatest contributions to (the exploration and exploitation of) the resources of the area" including at least one state from Eastern Europe
four from countries importing seabed minerals, including at least one state from Eastern Europe
four from countries exporting such minerals including 2 LDC
six LDC
18 members elected on the basis of "equitable geographical distribution".
One cannnot tell exactly how seats will be distributed under this formula. However, as the election of members to the Council is in the hands of the assembly, representation least favourable to developed countries could not be discounted. There is no assurance that developed states would receive nine or more seats. Given that "decisions (in the council) on questions of substance shall be taken by a three fourth majority of the members present and voting", that "the decision on an issue as to whether or not a matter is one of substance" is to be similarly decided and assuming all members would attend and vote, the developed states would never exercise control and could only exercise a veto under the most favourable circumstances.
46. *Id.*, Article 160.2(iii).
47. *Id.*, Article 160.2(i).
48. *Id.*, Article 160.2(ix).
49. *Id.*, Article 160.2(x).
50. *Id.*, Article 160.2(xi).
51. *Id.*, Article 160.2(xvi).
52. *Id.*, Article 151.4.
53. *Id.*, Article 160.2(xi).
54. *Id.*, Article 163.2(xiv).
55. *Id.*, Article 160.2(xvi).
56. *Id.*, Article 158.2 (xvi).
57. *Id.*, Article 162.7.
58. *Id.*, Article 160.2(xii).
59. *Id.*, Article 161.8.
60. *Id.*, Article 163.2.
61. *Id.*, Article 163.2(xiv).
62. *Id.*, Article 150.1(a).
63. *Id.*, Article 150.1(d).
64. *Id.*, Article 150.1(f).

65. *Id.*, Article 150.1(g).
66. *Id.*, Article 150.1(g)A.
67. *Id.*, Article 150.1(g)B.
68. *Id.*, Article 150.1(g)D.
69. See, e.g. letter of Cyrus Vance to the Chairman of the U.S. House Sub-Committee on Oceanography of the Committee of Merchant Marine and Fisheries.
70. It is assumed that an adverse effect on developing countries' earnings from nickel and copper can be ascribed to deep sea mining. Even if adverse effects can be proved it would be very difficult to allocate effects between deep seabed and land based mines. The effect of sea based production on the market will be indistinguishable from that from anywhere else. If land based and sea and deep sea mines start up together which, if any, causes the adverse effect? What if supply and demand are balanced even after the start up of deep sea mines but there is then a serious drop in demand? Looked at from a point of view of equity, a small number of countries, developed or otherwise, mines nickel and of these only a very few rely heavily on nickel as a major export of significance to the total economy. Granted that the protection of developing countries from adverse effects is desirable, it is far from equitable that such a small number of countries should hold up the possible benefits for other developing countries of more assured supplies of nickel. Direct income transfers through the Authority would be a more equitable and economically efficient means of achieving the objective.
71. *Id.*, para 2(a).
72. *Id.*, para 1.
73. *Id.*, Para 3(b)(iii).
74. *Id.*, para 3(b)(ii).
75. *Id.*, para 5(j).
76. *Id.*, para 5(j)(iv).
77. *Id.*, para 5(a).
78. *Id.*, para 5(g).
79. *Id.*, para 5(c).
80. *Id.*, para 5(f).
81. *Id.*, para 5(e).
82. *Id.*, para 10.
83. *Id.*, para 12(a)(i).
84. *Id.*, para 12(c).
85. *Id.*, para 7.
86. *Id.*, Article 187 *et. seq.*
87. *Id.*, Article 188.
88. *Id.*, Article 191.
89. *Id.*, Article 158.2(ii).
90. *Id.*, Article 166, 167.
91. *Id.*, Article 167.
92. *Id.*, Article 169.
93. *Id.*, Annex III.
94. *Id.*, Article 140.
95. *Id.*, Article 158.2.
96. *Id.*, Article 148.
97. Emanating from consultations amongst governments and companies in the EEC Group.
98. The debate over access takes the form of the question whether or not it is "assured". The term has served more than any other part of the Committee One litany to polarise, and obscure, argument. It is a question of what degree of assurance can be given to miners that, if they identify and prove a mine site, that they will be permitted to exploit. In no national mining system with which the writer is aware is the legal assurance absolute, as invariably the state retains dispositive discretion, although in practice, rights of exploitation normally are awarded to the discoverer. Equally, if the Authority is to be given the necessary flexibility to manage the seabed in perpetuity, it can give no absolute guarantees. It must have regulatory powers to evaluate applicants and to insist on appropriate contractual terms in the light of its experience. That is not to say, however, that objective standards of fairness and relevance against which to measure administrative action should not be devised and entrenched. This has not yet been achieved in the Text, and investors and financiers would be justified in regarding their protection in this respect as inadequate. The addition of the

objective standards referred to would still leave discretions in the Authority, but as the current consortia will be the only ones capable of mining when the time comes, and as the physical magnitude of the resource makes overlapping claims remote, it seems that the risk of denial of access would be insignificant.

99. See, for example, Joint letter to the President of the United States from the Chairman of the House of Representatives Committee on Merchant Marine and Fisheries and Sub-Committee on Oceanography of 29 January 1979, and the reply thereto of Cyrus Vance, United States Secretary of State. The Chairman strongly attacked the position at LOSCON into which the U.S. delegation seemed to be moving, claiming that even the best treaty the negotiators could hope to achieve would not receive the necessary 2/3 approval of the Senate necessary for advice and consent. See, also, letter from 16 environmental and social action groups to the President of the United States protesting the state of the negotiation dated 27 February 1979.

1. See Dykstra, Manganese — Its Strategic Implications; Statement before the sub-Committee on Energy Research and Development of the Senate Committee on Energy and Natural Resources, 29 March 1979 (hearings on S.493).
2. Before the Senate Committees on Energy and Natural Resources and the Committee on Commerce, Science and Transportation on 29 March 1979. See, especially, statements of Marne A. Dubs on behalf of the Kennecott Copper Corp. and The American Mining Congress; Northcott Ely, Special Counsel for Ocean Mining Associates, and Elliot L. Richardson, Leader of the United States Delegation at LOSCON.
3. See, statement of Elliot L. Richardson, *Supra*, n. 2.
4. Section 493, 2(a) and 3.
5. *Id.*, 2(a).
6. See, Statement of Elliott L. Richardson, *Supra*, n. 2.
7. Section 493, 4.
8. *Id.*, 101 and 102.
9. *Id.*, 4(12) and 117.
10. *Id.*, 201.
11. *Id.*, 202.
12. *Id.*, 202.
13. See Statement of Marne A. Dubs, *Supra*, n. 2.
14. See, s.713, a predecessor of s.493, introduced and debated in 1976.
15. Section 493, 102(c)2.
16. *Id.*, 103(c)5.
17. *Id.*, 503(c).
18. *Id.*, 3(d).
19. Document 8/2363, 7/12/78, Subject matter 75D, 8th Session, Deutcher Bundestag.
20. *Id.*, 3(1).
21. *Id.*, 3(i).
22. *Id.*, 15(1) and (2).
23. *Id.*, 1.
24. *Id.*, 4.
25. *Id.*, 14.
26. *Id.*, 16.
27. *Id.*, 12.
28. *Id.*, 13(2).
29. *Id.*, 15(1).
30. *Id.*, 15(2).
31. Public Letter from 3 prominent FRG parliamentarians to the Chairman of the U.S. Senate Sub-Committee on Oceanography, John B. Breaux, dated 10 January 1979, expressing concern at the maritime features of HR2759.
32. See, e.g., Letter of the Chairman of the Group of 77 in LOSCON (Satya N. Nandan of Fiji) to Heads of Delegations of the Group of 77 dated 23 February 1979, in which delegations were urged to review their strategic positions relative to the seabed to allow a LOSCON conclusion before the passage of U.S. or FRG legislation.
33. Which occurred at the January 1979 Intersessional LOSCON negotiations.
34. In its official statement in response to the claim of Deep Sea Ventures the U.S. Department of State announced that, while it supported an international solution and deplored unilateral claims,

The position of the United States Government on deep ocean mining pending the outcome of the Law of the Sea Conference is that mining of the seabed beyond the limits of national jurisdiction may proceed as a freedom of the high seas under existing international law.

14 Int'l. Legal Material (Jan. 1975). See, also the speeches of Mr. Kissinger before the American Bar Association Annual Convention in Montreal, August 11, 1975 (Dept. of State Press Release No. 408 of 1975); before the Foreign Policy Association, U.S. Council of the International Chamber of Commerce, New York City, April 8, 1976 (Dept. of State Press Release No. 762 of 1976). See, also, Interview with Elliot L. Richardson 28 August 1978 U.S. News and World Report, Inc., 59.