The Legal Régime of Marine Scientific Research and the Third United Nations Conference on the Law of the Sea

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A. The Legal Framework of Marine Scientific Research[1])

1. Introduction

1.1. What is Marine Scientific Research?

Art. 48 of Part III of the Revised Single Negotiating Text (RSNT), of 6 May 1976[2]), which is now superseded by the Informal Composite

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[1]) Most of the studies on the conduct of marine scientific research are the work of scientists. Among the purely legal writings on the subject, the following are of particular interest: L. J. Bouchez, The Legal Regime of Scientific Research on the Sea-Bed, in: J. Sztucki (ed.), Symposium on the International Regime of the Sea-Bed (Rome, Accademia Nazionale dei Lincei, 1970), pp. 591–618; E. D. Brown, Freedom of Scientific Research and the Legal Regime of Hydrospace, Indian Journal of International Law, vol. 9 (1969), pp. 327–380; W. T. Burke, Marine Science Research and International Law, Law of the Sea Institute, University of Rhode Island, Occasional Paper No. 8 (1970); M. Redfield, The Legal Framework for Oceanic Research, in: W. S. Wooster (ed.), Freedom of Oceanic Research (New York 1974), pp. 41–95; R. Winner, Science, Sovereignty, and the Third Law of the Sea Conference, Ocean Development and International Law Journal, vol. 4 (1977), pp. 297–342; R. Wolfrum, Der Schutz der Meeresforschung im Völkerrecht, German Yearbook of International Law, vol. 19 (1976), pp. 99–127. See further O. Freymond, Le statut de la recherche scientifique marine en droit international (Eysins 1978); J. R. Moore, The Future of Scientific Research in Contiguous Research Zones: Legal Aspects, The International Lawyer, vol. 8 (1974), pp. 242–261.

[2]) Doc. A/CONF. 62/WP. 8/Rev. 1/Part III, reprinted in Third United Nations Conference on the Law of the Sea, Official Records (hereinafter referred to as UNCLOSOR), vol. V, p. 173.

Negotiating Text (ICNT) issued on 15 July 1977[3]), gives the following definition:

"'marine scientific research' means any study or related experimental work designed to increase mankind's knowledge of the marine environment"[4]).

This definition was intended to cover "pure" or "fundamental" as well as "applied" research. According to another rule of Part III of the RSNT, the coastal State was to be permitted to withhold its consent for applied or "resource-related" marine scientific research to be conducted in its economic zone or on its continental shelf, *i.e.* for research bearing "substantially upon the exploration and exploitation of the living or non-living resources"[5]). Such "resource-related" or "applied" research, in turn, was distinguished from the actual exploration (and exploitation) of natural marine resources.

The origins of these distinctions between fundamental scientific research, resource-related research, and the exploration (and exploitation) of natural resources can be traced back to the Geneva Convention on the Continental Shelf of 1958[6]). Art. 5 (1) of that Convention prohibits the coastal State from interfering in any way with "fundamental oceanographic or other scientific research carried out with the intention of open publication", while Art. 5 (8) provides that coastal State consent is required for any research "concerning the continental shelf and undertaken there" (this requirement applies *a fortiori* to activities of exploration and exploitation). Para. 8 of Art. 5 however adds that such consent shall not be "normally" withheld if it is solicited

"by a qualified institution with a view to purely scientific research into the physical or biological characteristics of the continental shelf . . .".

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[3]) Doc. A/CONF. 62/WP. 10, UNCLOSOR, vol. VIII, p. 1.

[4]) In addition, such research must, according to Art. 241 of the ICNT, be undertaken exclusively for peaceful purposes and "with the appropriate scientific methods and means compatible" with the future Law of the Sea Convention. It shall not "unjustifiably" interfere with other legitimate uses of the sea and shall comply with "all relevant regulations established in conformity with [that] Convention including those for the protection and preservation of the marine environment".

[5]) In addition, the coastal State was to be entitled to refuse its consent to research involving drilling or the use of explosives, research requiring the construction, operation, or use of artificial islands, installations, and structures, and research which would unduly interfere with other lawful economic activities performed by the coastal State, cf. Art. 60 (2). See also *infra*, p. 872.

[6]) United Nations Treaty Series, vol. 499, p. 311.

Whichever be the precise relations between paras. 1 and 8 of Art. 5 [7]), a clear distinction is thus drawn, as regards marine scientific research undertaken in certain areas of coastal State jurisdiction, between resource-related research, exploration, and exploitation, on the one hand, and fundamental research, on the other.

This distinction made by the 1958 Convention on the Continental Shelf has come under heavy attack, mainly on the part of developing coastal States. A first argument put forward by these States is that even the "purest" marine scientific research will inevitably have at least some direct or indirect bearing on natural resources; a similar objection has been levelled at the distinction between marine scientific research and intelligence operations. According to a second argument, activities that are characterised as research may serve as a disguise for operations which are in reality related to the exploration or exploitation of natural resources [8]) or to the gathering of military intelligence [9]); it is argued that this is due to the fact that marine scientists, explorers, exploiters, and intelligence units use similar techniques and instruments. These two arguments, while understandable, are not entirely convincing.

It is true, as claimed in the first argument, that one day all fundamental research may acquire some practical relevance, but this does not mean that such research is undistinguishable from applied research. The difference between the two categories lies in the fact that applied research is undertaken with the intention of producing certain practical results, while fundamental research is not. The intentions of an institution or of individuals claiming to conduct marine scientific research can be ascertained by examining whether the open

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[7]) On this point, cf. *infra*, p. 861.

[8]) See the examples given by H. T. Franssen, Developing Country Views of Sea Law and Marine Science, in: W. S. Wooster (ed.), *op.cit.* (*supra* note 1), pp. 137–177, at pp. 158–159.

[9]) See the "Pueblo" incident mentioned by W. L. Sullivan, Freedom of Scientific Inquiry, in: L. M. Alexander (ed.), Proceedings of the Fourth Annual Conference of the Law of the Sea Institute, June 23–26, 1969 (Kingston, Rhode Island 1969), pp. 364–376, at p. 370, and by W. T. Burke in his Remarks, *ibid.*, pp. 391–392. As pointed out by J. A. Knauss in his statement before the Subcommittee on Ocean Space of the U.S. Senate Foreign Relations Committee (reprinted *ibid.*, at pp. 404–408), the irony of the "Pueblo" incident is that the "Pueblo" would have had every right to be where it was, outside the twelve-mile territorial sea of North Korea and above the North Korean continental shelf, had it not masqueraded as a research vessel (p. 408). Indeed, while certain research activities connected with the continental shelf require the consent of the coastal State, military activities do not.

publication of the results of the project is intended or not[10]). Neither exploration or exploitation activities nor resource-related or military research will meet the condition of open publication, for the results of such activities or research will necessarily remain secret; there is no reason, on the other hand, to refuse to publish the results of fundamental research.

It could be contended, however, that the criterion of open publication which has just been suggested would fail to protect coastal State interests in borderline cases, that is, in situations where the planned research is partly fundamental in nature and partly aimed at obtaining practical results. This is simply not true, for the requirement of open publication will place these practical results in the hands of all States, including the coastal State, and the researching State[11]) will thus be unable to derive economic advantages from them. It will in fact be the coastal State which will mainly benefit from these results, for it enjoys exclusive resource jurisdiction over the area in which the research is carried out.

The criterion of intention as evidenced by the readiness to proceed to open publication also serves for distinguishing between marine scientific research and military intelligence operations. By their very nature, such operations are secret, and the State undertaking them will be unwilling to publish their results; therefore, an intention of open publication expressed by that State will show that the activities

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[10]) Cf. the discussion in Sztucki (ed.), Symposium on the International Regime of the Sea-Bed, *op.cit.* (*supra* note 1), p. 668; W. Burger, Treaty Provisions Concerning Marine Science Research, Ocean Development and International Law Journal, vol. 1 (1973), pp. 159–184, at pp. 170–172; Franssen, *op.cit.* (*supra* note 8), p. 158. Open publication is also one of the criteria used by Art. 5 (8) of the 1958 Geneva Convention on the Continental Shelf for the identification of fundamental research, see *infra*, p. 861. Knauss, Proceedings of the Fourth Annual Conference of the Law of the Sea Institute, *op.cit.*, pp. 400–401, suggested that it was impossible to distinguish between the two types of research but later changed his views, cf. J. A. Knauss, Development of the Freedom of Scientific Research Issue of the Third Law of the Sea Conference, Ocean Development and International Law Journal, vol. 1 (1973), pp. 93–120, at pp. 105–109. For the difficulty of distinguishing biological (fundamental) and resource-related research in fishery matters, see J. A. Tegger Kildow, Nature of the Present Restrictions on Oceanic Research, in: W. S. Wooster (ed.), *op.cit.* (*supra* note 1), pp. 5–28, at p. 21.

[11]) The term "researching State" will be used to refer to States which conduct marine scientific research themselves as well as to States whose private institutions and individuals are engaged in such research.

envisaged constitute research and not intelligence operations. It is however conceivable that marine scientific research will produce certain results which, if published openly, could imperil the security of the coastal State. It might hence be indicated to institute procedures by which the coastal State could prevent their publication.

It will be recalled that according to the second argument advanced by coastal States, a foreign "researcher" claiming that he is conducting fundamental research in waters under coastal State jurisdiction may in reality pursue other prohibited or regulated activities, for instance the exploration or exploitation of natural resources, or espionage. This is not, however, a question relating to the distinction between exploitation or exploration of natural resources, applied research, fundamental research, and intelligence operations, but a problem of control and surveillance. Indeed, the possibility that a right to conduct fundamental research may lead to abuses cannot be eliminated simply by negating the difference between fundamental and applied research and by submitting both types of activities to discretionary coastal State consent; for even under such a comprehensive system of consent, the coastal State would have to ascertain whether the research which was authorised by it is being conducted in accordance with the terms of the authorisation [12]). Such control can be effected by regular patrols in the research area and, in certain instances, by coastal State participation in the project.

1.2. The Different Types of Marine Scientific Research

The two main categories of marine scientific research — fundamental and resource-related research — have been defined above, and a distinction has been drawn between such research, on the one hand, and the exploration and exploitation of natural resources and intelli-

[12]) Except, of course, if it were the policy of that State never to grant permission for any kind of research in marine areas placed under its jurisdiction.

Similar problems of control arise in other fields of the Law of the Sea, for instance in connexion with the innocent passage of foreign vessels in the territorial sea. While pretending to effect innocent passage, such ships might for instance attempt to engage in fishing. Despite the possibility of such abuses, no one is suggesting that the right of innocent passage should be abolished. Besides, even the replacement of the right of innocent passage in the territorial sea by a system of coastal State authorisation would not eliminate possible abuses, as the coastal State would still have to verify whether passage is being effected in accordance with the terms of the authorisation or whether the vessel is in fact engaged in prohibited activities.

gence operations, on the other. Fundamental research can, in turn, be divided into research which is "of general social importance to most of mankind" — the study of global pollution or of long-range weather forecasting, for example — and research "which is socially neutral", such as the study of continental drift and sea-floor spreading [13]). From the legal point of view, this subdivision does not, however, seem relevant and may hence be disregarded.

1.3. The Conditions for the Conduct of Marine Scientific Research, the Legal Status of Research Facilities and Personnel, and Liability and International Responsibility for Injuries Arising from Research Activities

The rules of international law on marine scientific research have varied, and will vary, in accordance with the legal status of the marine areas in which the research is being conducted. The rules applicable to research carried out in the territorial sea, for instance, are quite different from those governing similar activities on the high seas. Accordingly, an area-by-area approach will be adopted in examining the first and the second of the three main problems which arise in connexion with the legal regime of marine scientific research, namely: (i) the conditions for the conduct of marine scientific research; (ii) the legal status of research facilities and personnel; and (iii) liability and international responsibility for injuries resulting from marine scientific research.

For a complete examination of the legal regime of marine scientific research, it would moreover be necessary to deal with certain other problems, such as the promotion and facilitation of research [14]), global and regional cooperation in the field [15]), with particular reference to the riparians of semi-enclosed seas [16]), the development and transfer of marine technology in matters of marine scientific research [17]), the possible impact of such research on the marine environment [18]), and the special rights and interests of land-locked and of geographically

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[13]) Knauss, Development of the Freedom of Scientific Research Issue . . ., *op.cit.* (*supra* note 10), pp. 100—101.

[14]) Arts. 240, 243–245, 252, and 256 of the ICNT.

[15]) Arts. 243–245 of the ICNT.

[16]) Art. 123 (c) of the ICNT.

[17]) Arts. 267–274, 276–278, and 143 of the ICNT.

[18]) Art. 241 (d) of the ICNT.

disadvantaged States[19]). Lack of space prevents the authors from examining these questions, interesting though they may be. Similarly, the authors will omit detailed analysis of the problem of "competent" international organisations conducting marine scientific research and of the conditions to be observed by coastal States when carrying out research in marine areas placed under their own jurisdiction.

2. The Conditions for the Conduct of Marine Scientific Research

2.1. Internal Waters

Internal waters are the marine areas located landward of the baselines used for measuring the breadth of the territorial sea. Under the rules of customary international law, the coastal State enjoys full sovereignty over these waters, including the seabed, its subsoil, and the superjacent air space; the only exception to this domination is the subsistence of a right of innocent passage of foreign vessels in marine areas

"[w]here the establishment of a straight baseline ... has the effect of enclosing as internal waters areas which had not been previously considered as such ..."[20]).

This almost complete assimilation of the coastal State's internal waters to its land territory means that that State has an exclusive right to conduct research in these waters. Consequently, any research to be conducted in internal waters by foreign States, institutions, or individuals, or by international organisations, must be explicitly approved by the coastal State, and such approval can of course be made dependent on compliance with the conditions that may be imposed by that State as well as with the laws and regulations enacted by it[21]).

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[19]) Art. 255 of the ICNT, reproduced *infra* note 80.

[20]) Art. 8 (2) of the ICNT, inspired by Art. 5 (2) of the 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone, United Nations Treaty Series, vol. 516, p. 205.

[21]) Winner, *op.cit.* (*supra* note 1), p. 301. A particular problem arising in connexion with marine scientific research in internal waters is the access to, and use of, maritime ports by foreign research vessels. The successful completion of a research project may to a large extent depend on the possibility of calling in such ports for taking aboard supplies, instruments, and personnel. According to Burke, Marine Science Research and International Law, *op.cit.* (*supra* note 1), pp. 1–2, coastal State consent is required for port calls of both public and private foreign research vessels. This assertion seems too categorical. There is no indication that customary international law distinguishes between private research vessels and other foreign private ships as regards

2.2. Territorial Sea

Art. 1 (1) of the Geneva Convention on the Territorial Sea and the Contiguous Zone of 1958 states that:

> "[t]he sovereignty of a State extends, beyond its land territory and its internal waters, to a belt of sea adjacent to its coast, described as the territorial sea" [22].

This sovereignty is subject to the right of innocent passage of foreign vessels [23]. It would seem safe to add that at the present time the maximum breadth of the territorial sea probably is twelve nautical miles [24].

The fact that, except for the right of innocent passage of foreign ships, the territorial sea, including its seabed and subsoil and the superjacent air space [25], falls under the exclusive jurisdiction of the coastal State leads to the conclusion that marine scientific research to be conducted by foreign States, institutions, or individuals, or by international organisations, requires the coastal State's consent. It has been suggested [26], however, that research which can be undertaken in the course of innocent passage and which is compatible with such passage can be conducted without the coastal State's permission. This suggestion seems erroneous, for it unduly extends the concept of innocent passage. Indeed, the very use of the word "passage" shows that the concept in question

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access to, and the use of, maritime ports; consequently, the rules governing the latter also apply to the former. According to G. Gidel, Le droit international public de la mer (Paris 1932–1934), vol. II, pp. 39 ff., maritime ports are presumed to be open to foreign private ships; this presumption — which of course implies no permission to undertake marine scientific research in the waters of the port State — can however be destroyed by that State by making the access to, and the use of, the port dependent on its explicit consent. Gidel seems to have thought that the same presumption exists for public vessels, while Redfield, *op.cit.* (*supra* note 1), p. 43, expresses the view that such vessels must obtain prior diplomatic clearance.

[22]) Art. 1 (1) of the Geneva Convention on the Territorial Sea; see also Art. 2 (1) of the ICNT.

[23]) Arts. 14 ff. of the Territorial Sea Convention and 17 ff. of the ICNT.

[24]) The figure of twelve miles, which may be implicit in Art. 24 (2) of the Territorial Sea Convention and which has been adopted by a large segment of State practice, has been incorporated into Art. 3 of the ICNT.

[25]) In its Art. 2, the Chicago Convention on International Civil Aviation of 7 December 1944, United Nations Treaty Series, vol. 15, p. 296, provides: "For the purposes of this Convention, the territory of a State shall be deemed to be the land areas and territorial waters adjacent thereto under the sovereignty . . . of such State".

[26]) Burger, *op.cit.* (*supra* note 10), p. 172; E. Menzel, Scientific Research on the Sea-Bed and Its Regime, in: Sztucki (ed.), *op.cit.* (*supra* note 1), pp. 619–647, at p. 622; R. Revelle, Scientific Research on the Sea-Bed, *ibid.*, pp. 649–663, at p. 660.

is strictly limited to a right of communication and thus excludes any other activities. Marine scientific research in the territorial sea of a foreign State, even if carried out *en route* and without stopping or anchoring, cannot therefore be subsumed under the expression "passage". It must thus be concluded that while a research vessel enjoys a right of innocent passage like any other foreign ship, such passage does not entail the right of engaging in marine scientific research activities even if they can be conducted while the vessel is in movement[27]). This conclusion is in line with Art. 246 of the ICNT, which prescribes that the conduct of marine scientific research in the territorial sea requires the explicit consent of the coastal State and which adds that such consent may be granted conditionally.

If research in the territorial sea has been authorised by the coastal State, it must be carried out in conformity with the laws and regulations of that State. This rule of customary law is now reflected in Art. 246 of the ICNT, according to which

> "[c]oastal States, in the exercise of their sovereignty, have the exclusive right to regulate, authorize and conduct marine scientific research in their territorial sea" (emphasis added),

and in Art. 21 (1), which provides that

> "[t]he coastal State may make laws and regulations, in conformity with the provisions of the present Convention and other rules of international law, relating to innocent passage through the territorial sea, in respect of all or any of the following: . . . (g) Marine scientific research and hydrographic surveys . . ."[28]).

2.3. Straits and Archipelagic Waters

Neither international custom nor the Geneva Convention on the Territorial Sea contains specific rules on the conduct of marine scientific research in straits used for international navigation or in marine spaces

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[27]) Redfield, *op.cit.* (*supra* note 1), pp. 44–45; Brown, *op.cit.* (*supra* note 1), pp. 338–340; E. Ferrero, The Latin American Position on Legal Aspects of Maritime Jurisdiction and Oceanic Research, in: Wooster (ed.), *op.cit.* (*supra* note 1), pp. 97–136, at. p. 107.

[28]) The issue being fully covered by Art. 246, Art. 21 (1) (g) of the ICNT should be deleted as repetitive and ambiguous. Indeed, the reference to marine scientific research in connexion with innocent passage might lead to the inference that as a rule such research may be undertaken in the course of such passage. This inference would conflict with Art. 246, which gives coastal States the right to authorise (or prohibit) research in their territorial sea.

located between islands forming a mid-ocean archipelagic State. Accordingly, the rules applicable to such research must be deduced from the general rules governing these areas.

Although neither the Geneva Convention on the Territorial Sea nor the decision of the International Court of Justice in the *Corfu Channel* case (Merits)[29] expressly says so, a geographical strait forms a strait in the legal sense only if its breadth at the entrance points does not exceed the double breadth of the territorial sea[30]. Being territorial waters, straits waters are placed under coastal State sovereignty except for the right of innocent passage of foreign vessels. The only feature distinguishing straits waters from the "ordinary" territorial sea is that within the former the right of innocent passage of foreign vessels may not be suspended[31]; in all other respects, straits waters are treated exactly like the other parts of the territorial sea.

As noted above, the right of innocent passage in the territorial sea in no way implies a right to conduct marine scientific research in the course of such passage. Since the rules concerning innocent passage are the same in the territorial sea and in straits — except as regards the possibility of suspending such passage — no right to carry out research is implicit in the right of innocent passage through straits either. This conclusion is reflected in Art. 40 of the ICNT, which provides:

> "During their passage through straits, foreign ships, including marine research and hydrographic survey ships, may not carry out any research or survey activities without the prior authorization of the States bordering straits".

This rule is intended to apply to both types of straits, *i.e.* to those which will continue to be governed by the régime of innocent passage as well as to those in which the more liberal régime of transit passage will prevail in future[32].

[29] I.C.J. Reports 1949, p. 4.

[30] In this sense Gidel, *op.cit.* (*supra* note 21), vol. III, pp. 730, 735; R. R. Baxter, The Law of International Waterways (Cambridge, Mass. 1964), pp. 159–160. The opposite view is expressed by R. Lapidoth, Les détroits en droit international (Paris 1972), pp. 16–19.

[31] Art. 16 (4) of the Geneva Convention on the Territorial Sea; Art. 45 (2) of the ICNT. The suspension of transit passage is prohibited *a fortiori,* cf. Art. 44 of the ICNT.

[32] The régime of transit passage will be applicable to all straits with the exception of (i) maritime passages which are formed by an island of the State bordering the strait and the mainland of that State, on the condition that there is a high seas route or a route in an economic zone of similar convenience seaward of the island and (ii) arms of the sea which link an area of high seas or an economic zone with the territorial sea of a State. See Arts. 37, 38 (1), and 45 (1) of the ICNT.

Both customary international law and the 1958 Geneva Conventions on the Law of the Sea are silent on the legal status of the waters between islands forming a mid-ocean archipelagic State. It follows that unless these waters can be considered as internal or territorial waters of one of the individual islands forming the archipelago, they must be regarded as forming part of the high seas and, hence, as being governed by the principle of freedom of marine scientific research[33]). This situation is about to change. Part IV of the ICNT, which deals with mid-ocean archipelagic States and whose contents are already widely accepted, provides that the waters which can be enclosed within "straight archipelagic baselines joining the outermost points of the outermost islands and drying reefs of the archipelago"[34]) shall have a legal status which is very similar to that of the territorial sea: archipelagic waters will be placed under the exclusive jurisdiction of the archipelagic State[35]), the only exception to such jurisdiction being the existence of a (suspendable) right of innocent passage of foreign vessels. This will be true, in particular, with respect to marine scientific research, the conduct of which is thus dependent on the permission of the archipelagic State[36]). The only question that remains to be raised is whether such permission is also required in the "normal passage routes used as routes for international navigation", where foreign vessels are to enjoy a particularly liberal régime known as "archipelagic sealanes passage" (Art. 53 of the ICNT). The answer is that, this régime being in every way comparable to that of transit passage in straits, the conduct of marine scientific research in archipelagic sealanes calls for the authorisation of the archipelagic State; indeed, Art. 54 of the ICNT provides that Art. 40 of that Text — which makes research in straits dependent

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33) With the exception of research pertaining to the natural resources of the continental shelves belonging to the individual islands.

34) Art. 47 (1) of the ICNT. "The length of such baselines" — says para. 2 of Art. 47 — "shall not exceed 100 nautical miles, except that up to three per cent of the total number of baselines enclosing any archipelago may exceed that length, up to a maximum length of 125 nautical miles". The other conditions for the drawing of archipelagic baselines are set forth by paras. 3 to 5 of Art. 47.

35) This results from Art. 49 of the ICNT, which provides that the sovereignty of the archipelagic State extends to its archipelagic waters, as well as from Art. 54 mentioned below.

36) Despite the fact that Art. 246, which gives coastal States the exclusive right "to regulate, authorize and conduct marine scientific research in their territorial sea", omits to mention archipelagic waters.

on coastal State consent — shall apply *mutatis mutandis* to archipelagic sealanes.

2.4. The Continental Shelf and the Economic Zone

2.4.1. Introduction

The legal problems arising in connexion with marine scientific research are particularly acute as regards the continental shelf and the future economic zone. It will be convenient to examine these problems by successively describing the existing conventional and customary rules on the subject and the steps leading to the elaboration of new rules in the framework of the Third United Nations Conference on the Law of the Sea.

2.4.2. Marine scientific research connected with the continental shelf: the provisions of the Geneva Convention of 1958[37])

Under Art. 2 (1) of the Geneva Convention on the Continental Shelf, coastal States enjoy sovereign rights over the natural resources of their continental shelves and hence have the exclusive right to explore and exploit these resources. Accordingly, States, institutions, or individuals intending to conduct resource-related research on the continental shelf of a foreign State have to obtain that State's consent[38]). By contrast, no consent is required for research of any description on the high seas, for it results from Art. 2 (1) of the 1958 Convention on the High Seas[39]), as interpreted in the light of its preparatory

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[37]) On these rules see Bouchez, *op.cit.* (*supra* note 1), pp. 593–605; Brown, *op.cit.* (*supra* note 1), pp. 349–361; C.-A. Colliard, Le régime de la recherche scientifique sur le fond des mers, in: C.-A. Colliard/R.-J. Dupuy/J. Polvêche/R. Vaissière, Le fond des mers (Paris 1971), pp. 165–180, at pp. 173–175; M. S. McDougal/W. T. Burke, The Public Order of the Oceans (New Haven 1962), pp. 713–716 and 721–724, and Redfield, *op.cit.* (*supra* note 1), pp. 52–58.

[38]) Bouchez, *op.cit.*, pp. 593–594; Brown, *op.cit.*, p. 355.

[39]) This provision reads: "The high seas being open to all nations, no State may validly purport to subject any part of them to its sovereignty. Freedom of the high seas is exercised under the conditions laid down by these articles and by the other rules of international law. It comprises, *inter alia*, both for coastal and non-coastal States: (1) Freedom of navigation; (2) Freedom of fishing; (3) Freedom to lay submarine cables and pipelines; (4) Freedom to fly over the high seas".

work[40]), that there is freedom of marine scientific research on the high seas[41]), including the water column and air space above the continental shelf. Indeed, Art. 3 of the Continental Shelf Convention specifies that:

> "The rights of the coastal State over the continental shelf do not affect the legal status of the superjacent waters as high seas, or that of the air space above those waters".

This relatively simple situation – total freedom of research on the high seas, including the water column and the air space above the continental shelf – is however complicated by two further provisions of the Continental Shelf Convention.

The first of these provisions is para. 1 of Art. 5 of the Convention, which reads as follows:

> "The exploration of the continental shelf and the exploitation of its natural resources must not result in any unjustifiable interference with navigation, fishing or the conservation of the living resources of the sea, nor result in any interference with fundamental oceanographic or other scientific research carried out with the intention of open publication" (emphasis added).

Read in conjunction with the rules previously cited, this paragraph suggests that marine scientific research of a fundamental nature, regardless of whether it is conducted on the continental shelf or in the superjacent water column or air space[42]), shall have absolute priority over any activities pertaining to the exploration or exploitation of the shelf's natural resources[43]). As para. 1 of Art. 5 only mentions fundamental research, it must be assumed, *a contrario,* that justifiable interference by the coastal State with non-fundamental, *i.e.* applied research

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[40]) See Commentary 2 on Art. 27 of the Draft of the International Law Commission (which was to become Art. 2 of the High Seas Convention), Yearbook of the International Law Commission 1956, vol. II, p. 278. For comprehensive descriptions of the preparatory work, see Brown, *op.cit.* (*supra* note 1), pp. 349–361; McDougal/Burke, *op.cit.* (*supra* note 37), pp. 756–763.

[41]) The only limitation of this freedom can be found in Art. 2 (2) of the High Seas Convention, which reads: "These freedoms, and others which are recognized by the general principles of international law [such as the freedom of marine scientific research], shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas".

[42]) On this point, see however the observations made by Bouchez, *op.cit.* (*supra* note 1), pp. 602–603.

[43]) But it remains to be seen whether this priority is not limited by the general provision of Art. 2 (2) of the High Seas Convention (see *supra* note 41).

is permissible[44]); and if such applied "research" amounts to an exploration or exploitation of natural resources, the coastal State will have to give its consent, for under Art. 2 (1) of the Continental Shelf Convention such activities are reserved exclusively to that State[45]).

The second provision which complicates the situation is para. 8 of Art. 5 of the Convention. This provision reads:

> "The consent of the coastal State shall be obtained in respect of any research concerning the continental shelf and undertaken there. Nevertheless the coastal State shall not normally withhold its consent if the request is submitted by a qualified institution with a view to purely scientific research into the physical or biological characteristics of the continental shelf, subject to the proviso that the coastal State shall have the right, if it so desires, to participate or to be represented in the research, and that in any event the results shall be published".

This text has engendered considerable legal problems, some of which will be analysed hereafter.

The first problem pertains to the relation of this rule with para. 1 of Art. 5, which was quoted earlier. It will be recalled that the latter provides that the exploration and exploitation of the continental shelf must not result in "any interference" with fundamental marine scientific research. As noted already, this prohibition can be read as establishing an absolute priority of such research over the resource-related activities of the coastal State on its continental shelf. This priority seems to be negated by para. 8 of Art. 5, which makes "any research" connected with the shelf dependent upon the coastal State's consent. However, the contradiction between the two provisions is more apparent than real, for inasmuch as it relates to continental shelf research, para. 1 limits itself to providing that fundamental marine scientific research shall not be interfered with by certain other activities; it does n o t say when such research is permitted and when it is not. The latter point is dealt with by para. 8, which establishes two different systems of consent, one for resource-related, the other for fundamental research. If the above interpretation were rejected, it could be argued, alternatively, that para. 8 is a *lex specialis* which should be given priority over the more general provision of para. 1.

The second problem to be examined here concerns the interpretation of para. 8 itself, that is, the scope *ratione materiae* of the system of consent

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[44]) R e d f i e l d, *op.cit.* (*supra* note 1), p. 54.

[45]) On the question of the military uses of the continental shelf, see M c D o u g a l / B u r k e, *op.cit.* (*supra* note 37), pp. 716–717.

instituted by that provision. Para. 8 of Art. 5 requires coastal State consent for "any research concerning the continental shelf and undertaken there" (emphasis added). This could mean that such consent is needed for both "research concerning the continental shelf and [research] undertaken there", *i.e.* for research pertaining to the continental shelf but not conducted there as well as for research physically undertaken on the shelf but unrelated to it. This amounts to an extensive interpretation of para. 8, for the only research activities which remain free would be those which are undertaken in the superjacent water column or air space and are not related to the continental shelf. Para. 8 could also be read as establishing two cumulative conditions, that is, as requiring coastal State consent only for research which concerns the continental shelf and, moreover, is conducted there[46]). This restrictive interpretation implies that coastal State consent must not be sought for either research concerning the shelf but carried out in the superjacent water column or air space, or research undertaken on the shelf but unrelated to it. While the latter reading seems to reflect the clear and natural meaning of the phrase under consideration (and its French text — «recherches touchant le plateau continental, entreprises sur place» — strengthens this conclusion), it is not fully borne out by the objectives of the Continental Shelf Convention[47]). The preparatory work being inconclusive as well, the question will have to remain open.

A third problem pertains to the scope of para. 8 *ratione loci.* The inner and outer limits of the marine space to which that paragraph applies are somewhat uncertain, because the maximum breadth of the territorial sea was left unsettled by the 1958 and 1960 Geneva Conferences[48]) and, more importantly, because the outer limit of the continental shelf is in constant movement owing to the criterion of exploitability mentioned by Art. 1 (a) of the 1958 Convention[49]). The régime of

[46]) On these two interpretations, cf. also the remarks by Bouchez, *op.cit.* (*supra* note 1), p. 600.

[47]) The main objective of the Convention is to grant coastal States sovereign (and hence exclusive) rights of exploration and exploitation over the natural resources of their continental shelves. It could be argued that, in order to give adequate protection to these rights, Art. 5 (8) must be interpreted as requiring coastal State consent for any marine scientific research related to the shelf's resources, even if the research is to take place in the superjacent water or air space.

[48]) See, however, the remarks made *supra,* p. 855 and note 24.

[49]) Art. 1 declares that "[f]or the purposes of these articles, the term 'continental shelf' is used as referring (a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of

consent instituted by para. 8 can thus be said to expand with the limit of the continental shelf. It will not extend to seabed areas whose natural resources are not yet exploitable but in which marine scientific research is already possible[50]), for these areas, being unexploitable and hence located beyond the continental shelf as defined by Art. 1 (a) of the 1958 Convention, continue to form part of the high seas for the time being and are thus governed by the régime of freedom of research[51]). These observations do not, however, exhaust the discussion, for Art. 1 (a) of the 1958 Convention[52]) defines the outer limit of the continental shelf not only in terms of "exploitability", but also of "adjacence", and the meaning of the latter expression is far from being clear[53]).

The fourth and last problem which must be briefly referred to arises in connexion with some imprecise language used in para. 8. The interpretation of vague expressions such as "a qualified institution" and "shall not normally withhold . . . consent" poses serious difficulties. These difficulties are compounded by the absence of a universally binding and compulsory dispute settlement procedure in the system of the Geneva Conventions of 1958. Only few States have become Parties to the Optional Protocol of Signature concerning the Compulsory Settlement of Disputes appended to those Conventions[54, 55]). Thus, if the coastal State concerned is not a Party to the Optional Protocol, it will in practice be able to make its own interpretation of these expressions prevail. The fact that the scope *ratione materiae* and *ratione loci* of para. 8 of Art. 5 is unclear, the vagueness of certain concepts used by that

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200 metres or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas..." (emphasis added). See also Klemm, *supra* pp. 512 ff.

[50]) Colliard, *op.cit.* (*supra* note 37), p. 177.

[51]) This point can be illustrated by the expedition to the depths of the Marianna Trench (10'916 metres) undertaken in 1960 by Jacques Piccard in his bathyscaph "Trieste". It is evident that this expedition did not take place on the continental shelf but in the deep-seabed.

[52]) See *supra* note 49.

[53]) This remains true despite the discussion of this expression by the International Court of Justice in the *North Sea Continental Shelf* cases, I.C.J. Reports 1969, p. 3, at paras. 41–42.

[54, 55]) For the text of the Protocol, see United Nations Treaty Series, vol. 450, p. 169. According to the table found in S. Oda, The International Law of the Ocean Development, vol. I (loose-leaf ed., Leyden 1977), No. 1.6, there were 34 State Parties to the Protocol as of 1 January 1977.

provision – in particular of the expression "shall not normally withhold" – and the absence of a universally binding compulsory dispute settlement procedure therefore combine to give the coastal State virtually unfettered discretion in preventing foreign States, institutions, or individuals from carrying out any kind of marine scientific research on or above its continental shelf. And even if consent is forthcoming in a given case, it can be made dependent on whichever conditions the coastal State sees fit to impose.

2.4.3. Marine scientific research connected with the continental shelf: the rules of customary international law[56])

The 1958 Convention having been ratified, or acceded to, by a relatively modest number of States[57]), a majority of the members of the international community continue to be governed by the rules of customary law relating to the continental shelf. This raises the question of whether and to what extent the provisions of the Convention correspond to existing custom and thus are binding even on States which are not Parties to the Convention. In the *North Sea Continental Shelf* cases, the International Court of Justice was called upon to examine, *inter alia,* whether Art. 6 (2) of the 1958 Convention, which pertains to the delimitation of the continental shelf between adjacent States, reflected international custom. In its examination of this problem, the Court also dwelt on the customary or conventional nature of other provisions of the Convention, and it reached the conclusion that Arts. 1 to 3 reflect customary rules because they cannot form the object of reservations under Art. 12 of the Convention. Arts. 1 to 3 provide, *inter alia,* that the sovereign (and exclusive) rights of the coastal State are limited to the natural resources of its continental shelf and consequently do not affect the status of the superjacent waters and air space as high seas. There are, in the Court's view, other provisions of the 1958 Convention which are declaratory of customary law as well, such as those preventing the coastal State from impeding the laying or maintenance of submarine cables and pipelines on the continental

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56) See Brown, *op.cit.* (*supra* note 1), pp. 361–363; Redfield, *op.cit.* (*supra* note 1), pp. 58–60.

57) According to Oda's table (see *supra* note 54), there were 53 States Parties to the Convention as of 1 January 1977.

shelf (Art. 4) and those enjoining it to abstain from interfering unjustifiably with the freedoms of navigation, of fishing, of conservation of the living resources of the sea, and of conducting marine scientific research of a fundamental character (Art. 5 (1) and (6)[58]).

It should be noted in this connexion that the nature of the prohibition to interfere with fundamental research contained in Art. 5 (1) is somewhat complex. It will be recalled that that provision proscribes "any interference" with such research, thus establishing an absolute priority in favour of the latter. In so doing, Art. 5 (1) seems to go beyond the customary rules pertaining to marine scientific research[59]), for even customary law as codified by the Geneva Convention on the High Seas does not admit of such a priority. Indeed, Art. 2 (2) of that Convention states that:

> "These freedoms [the freedoms of the high seas] shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas" (emphasis added).

Consequently, the principle of priority expressed in Art. 5 (1) of the Continental Shelf Convention can be said to reflect a customary rule only if it is accompanied by the restriction established in Art. 2 (2) of the High Seas Convention; in other words, the customary rule is that of a reasonable — not absolute — priority.

Although Arts. 4, 5 (1) — with the restriction just noted — and 5 (6) of the Convention on the Continental Shelf are not expressly mentioned by Art. 12 as being among those to which no reservations can be made, the Court noted that they "do undoubtedly in principle relate to matters that lie within the field of received customary law" and that they

> "were mentioned in the Convention, not in order to declare or confirm their existence, which was not necessary, but simply to ensure that they were not prejudiced by the exercise of continental shelf rights as provided for in the Convention".

To the extent to which Arts. 4, 5 (1), and 5 (6) thus embody rules stating "obligations of general maritime law existing outside and independently of the Convention", they could not be cancelled by reservations[60]).

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[58]) Art. 5 (6) deals with installations and devices erected on the continental shelf by the coastal State. It provides that "[n]either the installations or devices, nor the safety zones around them, may be established where interference may be caused to the use of recognized sea lanes essential to international navigation".

[59]) Redfield, *op.cit.* (*supra* note 1), p. 60.

[60]) I.C.J. Reports 1969, paras. 63–65.

The Court's analysis suggests, in conclusion, that the principles set forth by Arts. 1 to 3 and the rules of the Continental Shelf Convention safeguarding the existing freedoms of the high seas, in particular Arts. 4, 5 (6) and, with the restriction noted above, 5 (1), must be regarded as reflecting customary principles and, as such, apply to all States. Conversely, all the rules limiting these freedoms, with the exception of Arts. 1 to 3 of the Convention, have to be considered as conventional. This is true, in particular, of Art. 5 (8), which has been analysed above and which severely restricts the traditional freedom of conducting marine scientific research. Accordingly, the customary rules on marine scientific research on the continental shelf and in the superjacent water and air space must be determined by taking into account Arts. 1 to 3 of the Convention, which provide that the sovereign rights of the coastal State over its continental shelf are limited to the exploration and the exploitation of its natural resources and do not affect the status of the superjacent water and air space, and Art. 5 (1) inasmuch as it protects the high seas freedom of marine scientific research from unreasonable interference. This leads to the conclusion that under customary international law there is freedom of marine scientific research in the superjacent water column and air space as well as on and under the continental shelf, as long as such research does not amount to exploration or exploitation of the shelf's natural resources.

2.4.4. Marine scientific research in the future economic zone and on the continental margin beyond the 200-mile limit

There is, within the Third United Nations Conference on the Law of the Sea, a clear and seemingly irreversible trend towards allowing coastal States to establish new maritime zones of limited national jurisdiction, referred to as "exclusive economic zones" by the ICNT[61]). In these zones of a maximum breadth of 200 nautical miles, coastal States would enjoy almost exclusive rights of exploration, exploitation, management, and conservation over all the living and non-living resources, as well as the jurisdictional powers incidental to the exercise of these rights. Coastal States would moreover enjoy exclusive rights to the natural resources of their "continental shelves", *i.e.* of the seabed and subsoil adjacent to their (twelve-mile) territorial seas "to the outer edge of the

[61]) See Gündling, *supra* pp. 616 ff.

continental margin, or to a distance of 200 miles from the baseline from which the breadth of their territorial sea is measured where the outer edge of the continental margin does not extend up to that distance" (Art. 76 of the ICNT)[62].

A question that has remained largely unsettled is the precise content to be given to coastal States' rights both within the future economic zone and on those parts of the continental shelf which are located beyond the 200-mile limit. This question is particularly acute as regards the conduct of marine scientific research and the status of research facilities and personnel. As the evolution of the debate on marine scientific research within the preparatory United Nations Seabed Committee (1968–1973) has been described elsewhere[63], it will be sufficient to recapitulate here the main positions taken during the debate by the members of the Committee with respect to marine scientific research in the future economic zone and on the continental shelf.

A first position, taken by the Soviet Union and its allies, was that fundamental as well as applied research should be free within the future economic zone (system of freedom of research)[64].

The second position, that of the United States, was that a distinction should be made between fundamental marine scientific research and other activities. Fundamental research was to be free in areas beyond the territorial sea, provided the researching State: (i) had notified the coastal State in advance of its intention to do such research and had submitted a description of the project to it; (ii) certified that the research would be conducted in accordance with the future Law of the Sea Convention "by a qualified institution with a view to purely scientific research"; (iii) gave the coastal State an opportunity to take part in the proposed research, either directly or indirectly through an international organi-

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[62]) See Klemm, *supra* pp. 512 ff. It should be added, however, that according to Art. 82 of the ICNT, the coastal State will have to contribute to the International Seabed Authority, under given conditions, a certain percentage of the mineral production of its continental shelf located beyond the 200-mile limit, or of the revenues derived from such production. The contributions or payments thus made shall be distributed by the Authority among its members "on the basis of equitable sharing criteria, taking into account the interests and needs of developing countries . . .".

[63]) See in particular S. Oda, The Law of the Sea in Our Time, vol. II: The United Nations Seabed Committee 1968–1973 (Leyden 1977), pp. 21, 70–72, 180, 221–223, 257–259, 288–291, 312–315, and Redfield, *op.cit.* (*supra* note 1), pp. 62–83.

[64]) Art. 2 of Doc. A/AC. 138/SC. III/L. 31 of 15 March 1973. Under Art. 11 of this draft proposal, scientific research "on the continental shelf" was to be conducted only with the coastal State's consent.

sation of its choice; (iv) was ready to share all data and samples with the coastal State and to assist the latter in their interpretation; (v) indicated its willingness to communicate the results of the research to the coastal State and to have them published as soon as possible in an open, readily available scientific publication; and (vi) undertook to ensure compliance with all applicable international environmental standards. Disputes in matters of marine scientific research were to be subject to a compulsory dispute settlement procedure (system of advance notification)[65].

A third main position in the debate of the Seabed Committee was that taken by Italy. According to an Italian proposal, at least part of the research to be conducted within areas of coastal State jurisdiction but outside the territorial sea should require the consent of that State; such consent was however to be presumed, should the coastal State have failed to respond to a request for consent within a given time-limit (system of presumed consent)[66].

The fourth and last main position assumed during the Committee's debate, which had the support of numerous developing coastal States, was based on the assumption that no valid distinction can be drawn between fundamental and applied research. This being the case — so ran the argument — the security of the coastal State and its rights over the natural resources of the future economic zone and of the continental shelf can be effectively protected only by requiring explicit coastal State consent for any kind of marine scientific research to be conducted in these areas (system of explicit consent)[67].

Soon after the opening of the Third United Nations Conference on the Law of the Sea, the Soviet Union abandoned its erstwhile position and joined the United States and other countries in advocating a system of advance notification for fundamental research in the economic

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[65]) Doc. A/AC. 138/SC. III/L. 44 of 19 July 1973. It is interesting to note that during and after the 1958 Conference, it was precisely the United States Government which took a strong stand in favour of coastal State control over marine scientific research connected with the continental shelf, see Burger, *op.cit.* (*supra* note 10), p. 164.

[66]) Proposal submitted on 14 August 1973, Doc. A/AC. 138/SC. III/L. 50.

[67]) Working Paper introduced by China on 19 July 1973, Doc. A/AC. 138/SC. III/L. 42; Draft presented by Brazil, Ecuador, El Salvador, etc., on 19 July 1973, Doc. A/AC. 138/SC. III/L. 45; Article submitted by Algeria, Brazil, China, etc., on 17 August 1973, Doc. A/AC. 138/SC. III/L. 55. The requirement of explicit consent had already been implied in Canada's Working Paper of 25 July 1972, Doc. A/AC. 138/SC. III/L. 18.

zone and on the continental shelf along the lines indicated above[68]). On the other side, members of the Group of 77 continued to press for a system of explicit coastal State consent for all types of research[69]). Finally, some members of the Group of 77 presented a set of draft articles embodying a system of presumed consent[70]). These articles were intended as a compromise proposal which could eventually become acceptable for the partisans of a system of simple advance notification as well as for those of a system of explicit consent. According to this proposal, a State planning to conduct marine scientific research in the economic zone or on the continental shelf of another State was to inform the latter of its intention. In so doing, it was to provide a full description of:

"(a) The nature and objectives of the research project;

(b) The means to be used, including name, tonnage, type and class of vessels;

(c) The precise geographical areas in which the activities are to be conducted;

(d) The expected date of first appearance and final departure of the research vessels or equipment, as the case may be; and

(e) The name of the sponsoring institute, its director and the scientist(s) in charge of the expedition" (Art. 7 (2) of the proposal).

In addition, the researching State was to indicate whether it considered the proposed research to be of a fundamental nature or not (Art. 7 (3)).

If the researching State and the coastal State were agreed as to the fundamental nature of the planned research, the latter State was to have two possibilities. The first possibility for it was to inform the researching State, within a four-months' period, of its intention to participate in the project, in which case the researching State would have been bound to:

"(i) ensure the right of the coastal State, if it so desires, to participate or to be represented in all phases of the research project;

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[68]) Draft Articles on Marine Scientific Research introduced by Bulgaria, Byelorussia, Czechoslovakia, etc., on 3 April 1975, Doc. A/CONF. 62/C. 3/L. 26, UNCLOSOR, vol. IV, p. 213. See also the Draft Articles submitted on 23 August 1974 by Austria, Belgium, Bolivia, etc., Doc. A/CONF. 62/C. 3/L. 19, *ibid.*, vol. III, p. 266.

[69]) Draft Articles on Marine Scientific Research presented by Colombia on behalf of the Group of 77 on 22 August 1974, Doc. A/CONF. 62/C. 3/L. 13, UNCLOSOR, vol. III, p. 254; revised version submitted on behalf of that Group by Iraq on 21 April 1975, Doc. A/CONF. 62/C. 3/L. 13/Rev. 2, *ibid.*, vol. IV, p. 199.

[70]) Draft Articles on Marine Scientific Research proposed by Colombia, El Salvador, Mexico, and Nigeria on 6 May 1975, Doc. A/CONF. 62/C. 3/L. 29, UNCLOSOR, vol. IV, p. 216.

(ii) provide an opportunity to participate directly in the research on board vessels at the expense of the State conducting the research but without payment of any remuneration to the scientist of the coastal State;
(iii) provide the coastal State with the final results and conclusions of the research project;
(iv) undertake to provide to the coastal State on an agreed basis raw and processed data and samples of material;
(v) if requested assist the coastal State in assessing the said data and samples and the results thereof;
(vi) ensure that the research results are made internationally available through international data centres or through other appropriate international channels as soon as feasible; and
(vii) comply with all relevant provisions of this convention".

The second possibility for the coastal State was either to inform the researching State that it did not intend to participate in the research, or to remain silent. In both cases the researching State was then to be free to execute its project, provided conditions (iii) to (vii) above were met (Art. 7 (5)).

If the researching and the coastal State were agreed that the proposed research was not fundamental in character, explicit coastal State consent was to remain necessary (Art. 7 (6) and (7)).

If the researching State contended that the projected research was fundamental while the coastal State was of a different opinion, finally, the ensuing dispute was to be settled through negotiations and conciliation. If these procedures failed to produce agreement, the coastal State was to "have the right to withhold its consent" (Art. 7 (9)). This expression was undoubtedly intended to mean that ultimately the unilateral qualification of the research as "non-fundamental" by the coastal State would prevail. In other words, even the conduct of objectively fundamental research was eventually to depend on coastal State consent; this being the case, one wonders what point there was in re-introducing the much-maligned distinction between fundamental and applied research. It follows that the only significant difference between this "compromise proposal" and the more extreme doctrine of explicit consent is that under the former consent is presumed if the coastal State fails to react to a request within a specified time-limit, while express consent is invariably required by the latter.

By and large, the three main positions which have just been outlined — the system of advance notification, the "compromise proposal", and the doctrine of explicit coastal State consent — remained unchanged as the work of the Law of the Sea Conference progressed. Only two

events are worth mentioning. The first consists in two proposals made by members of the Group of 77, to the effect that coastal State consent shall not be "unreasonably withheld"[71]) or that the coastal State shall "establish norms ensuring that such consent shall not be delayed or denied unreasonably"[72]). The second change to be mentioned is the *volte-face* produced by the Soviet Union on 14/15 June 1977[73]). After having been an ardent defender of the most liberal régime possible — complete freedom of research within the future economic zone — the Soviet Union now suddenly agreed to a system of presumed consent for all types of marine scientific research. It remains to be seen whether the few remaining advocates of some measure of freedom of fundamental research will remain true to their convictions or whether they will emulate the Soviet Union in the hope of obtaining some concessions in other areas of the Law of the Sea.

The above description conveys the impression that the idea of freedom of marine scientific research, like the idea of the freedom of the sea in general, is on a path of steady decline. This impression is confirmed by the succession of negotiating texts elaborated in the framework of the Third United Nations Conference on the Law of the Sea. These texts increasingly reflect the tendencies of those States — mainly members of the Group of 77 — which take an expansive view of coastal States' rights in the future economic zone and on the continental shelf, and a correspondingly dim view of the rights claimed in these areas by third States.

The provisions on marine scientific research contained in Part III of the Informal Single Negotiating Text (ISNT) of 6 May 1975[74]) had been relatively liberal. The conduct of fundamental research in the

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[71]) Amendment to Art. 60 (1) of Part III of the RSNT informally suggested by Trinidad and Tobago at the 1977 New York Session of the Conference, see R. Platzöder, Dokumente der Dritten Seerechtskonferenz der Vereinten Nationen — New Yorker Session 1977 (Ebenhausen, Stiftung Wissenschaft und Politik 1977), vol. II, p. 676.

[72]) Second draft of an amendment to Art. 60 (1) of Part III of the RSNT informally submitted by Ecuador at the 1977 New York Session of the Conference, *ibid.*, p. 675.

[73]) Amendments to Part III of the RSNT presented by the Soviet Union, *ibid.*, p. 685. See also the statements made by Mr. Tikhonov on 14 September 1976 and by Mr. Kozyrev on 14 June 1977 before the Third Committee of the Conference, reprinted in UNCLOSOR, vol. VI, p. 95, and Platzöder, *op.cit.* (*supra* note 71), vol. II, pp. 690–692, respectively.

[74]) Doc. A/CONF. 62/WP. 8/Part III, UNCLOSOR, vol. IV, p. 171.

economic zone or on the continental shelf required simple advance notification, while resource-related research was of course to depend on the coastal State's consent. The coastal State could object to a research project notified to it by claiming that the planned research was not of a fundamental nature and that it would impinge on its resource rights in the economic zone or on the continental shelf. A compulsory settlement procedure was provided for disputes pertaining to the nature of the proposed research.

The relative liberalism of this first Text was somewhat diminished by the provisions of Part III of the RSNT, which was produced exactly one year later. Art. 60 of Part III of that Text stated that marine scientific research could be conducted in the economic zone or on the continental shelf only with the consent of the coastal State. The rigour of this basic principle was, however, mitigated by three elements: (i) the coastal State was not to withhold its consent unless the planned research had a substantial bearing upon the exploration and exploitation of the living or non-living resources, or called for drilling or the use of explosives, unduly interfered with economic activities performed by the coastal State in conformity with the future Law of the Sea Convention, or involved the construction, operation, or use of artificial islands, installations, or structures; (ii) consent was to be presumed if the coastal State had omitted to express its refusal within a specified time-limit; (iii) an effective compulsory system of dispute settlement was still being provided for[75]). Hence, the three pillars of the freedom of marine scientific research — the distinction between fundamental and applied research, the concept of freedom of fundamental research or at least a system of automatic coastal State consent, and the existence of compulsory channels for the settlement of disputes — still stood, although they were being slowly eroded.

Their collapse came with the provisions on marine scientific research (Arts. 239 to 266) contained in the ICNT of 15 July 1977.

For the purposes of the present heading of our paper, the basic provisions of the ICNT are Arts. 56, 58, 247 to 256, 265, and 296.

Art. 56 of the ICNT defines the rights and duties of coastal States in their future economic zones. It provides that the coastal State shall

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[75]) See Art. 17 (1) (c) of Part IV of the RSNT, of 23 November 1976, Doc. A/CONF. 62/WP. 9/Rev. 2, UNCLOSOR, vol. VI, p. 144. For a detailed analysis of the provisions of the ISNT (and of the RSNT) on marine scientific research, see Winner, *op.cit.* (*supra* note 1), pp. 304 ff.

have "sovereign rights" as regards the exploration, exploitation, conservation, and management of the zone's natural resources, as well as with respect to the other economic uses of the zone. According to Art. 58, these rights are subject to the exercise, by third States, of the freedoms of navigation, of overflight, and of the laying and maintenance of submarine cables and pipelines. As regards marine scientific research, Art. 56 declares that the coastal State shall have "jurisdiction" (not "exclusive jurisdiction", as had been provided by Art. 44 of the RSNT) in conformity with "relevant provisions of the present Convention", *i.e.* Arts. 247 to 256 of the ICNT.

Art. 249 prescribes that States [76]) intending to conduct marine scientific research in the economic zone or on the continental shelf of another State shall provide that State, at least six months prior to the expected starting date of the research, with a full description of:

"(a) the nature and objectives of the research project;

(b) the method and means to be used, including name, tonnage, type and class of vessels and a description of scientific equipment;

(c) the precise geographical areas in which the activities are to be conducted;

(d) the expected date of first appearance and final departure of the research vessels, or deployment of the equipment and its removal, as appropriate;

(e) the name of the sponsoring institution, its director, and the person in charge of the research project; and

(f) the extent to which it is considered that the coastal State should be able to participate or to be represented in the research project" [77]).

This description simultaneously constitutes a request for consent addressed to the coastal State, in the sense of Art. 247 (1) and (2) [78]). These

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[76]) This provision and those which follow apply to "competent international organisations" as well.

[77]) These conditions are identical with those contained in the "compromise proposal" described *supra*, pp. 869—870.

[78]) The text of these provisions is as follows: "1. Coastal States, in the exercise of their jurisdiction, have the right to regulate, authorize and conduct marine scientific research in their exclusive economic zone and on their continental shelf in accordance with the relevant provisions of the present Convention.

2. Marine scientific research activities in the exclusive economic zone and on the continental shelf shall be conducted with the consent of the coastal State".

The essence of the provisions of Art. 247 was already contained in the "test proposal" made by the Chairman of the Third Committee of the Conference in his Report of 10 September 1976, UNCLOSOR, vol. VI, p. 91.

On the same day, a counter-proposal was submitted to the Third Committee by Australia. This counter-proposal, which is reprinted in Platzöder, *op.cit.* (*supra*

provisions make marine research in the economic zone or on the continental shelf[79]) dependent on the coastal State's permission as well as on compliance with the latter's laws and regulations and with the conditions set forth by Art. 250 (1). According to the latter provision, the researching State shall:

"(a) Ensure the rights of the coastal State, if it so desires, to participate or be represented in the research project, especially on board research vessels and other craft or installations, when practicable, without payment of any remuneration to the scientists of the coastal State and without obligation to contribute towards the costs of the research project[80]);

(b) Provide the coastal State, at its request, with preliminary reports, as soon as practicable, and with the final results and conclusions after the completion of the research;

(c) Undertake to provide access for the coastal State, at its request, to all data and samples derived from the research project and likewise to furnish it with data which may be copied and samples which may be divided without detriment to their scientific value;

(d) If requested, assist the coastal State in assessing such data and samples and the results thereof;

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note 71), vol. III, p. 943, reads as follows: "1. Marine scientific research activities in the economic zone or on the continental shelf shall be conducted with the consent of the coastal State in accordance with the provisions of this Convention, provided that [the] coastal State shall not deny its consent to the conduct of a marine scientific research project unless that project: (a) bears substantially upon the exploration and exploitation of the living or non-living resources; (b) involves drilling or the use of explosive on the continental shelf; or (c) involves the construction, operation or use of such artificial islands, installations, and structures as are referred to in Article 48 of Part II of this Convention.

2. Marine scientific research activities in the economic zone or on the continental shelf shall not unduly interfere with economic activities performed by the coastal States in accordance with its jurisdiction as provided for in this Convention".

[79]) But neither in the water column superjacent to that shelf outside the 200-mile limit (cf. Art. 258 of the ICNT) nor, it seems, in the air space beyond the territorial sea.

[80]) Attention should be drawn here to Art. 255 of the ICNT, which endeavours to protect the interests of "neighbouring" land-locked and geographically disadvantaged States by providing the following: "1. States and competent international organizations conducting marine scientific research in the exclusive economic zone or on the continental shelf of a coastal State shall take into account the interests and rights of neighbouring land-locked and other geographically disadvantaged States, as provided for in the present Convention and shall notify these States of the proposed research project as well as provide, at their request, relevant information and assistance . . .

2. Such neighbouring land-locked and other geographically disadvantaged States shall, at their request, be given the opportunity to participate, whenever feasible, in the proposed research project through qualified experts appointed by them".

(e) Ensure, subject to paragraph 2 of this article, that the research results are made internationally available through appropriate national or international channels, as soon as feasible;

(f) Inform the coastal State immediately of any major change in the research programme;

(g) Unless otherwise agreed remove the scientific installations or equipment once the research is completed".

If the coastal State fails to react within four months from the date of receipt of the description and request, the researching State may begin to carry out its project after a period of six months calculated from that same date (Art. 253).

In "normal circumstances", says Art. 247 (3), the coastal State shall give its consent for marine scientific research projects

"to be carried out in accordance with the present Convention exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of all mankind"[81]);

it further provides that:

"coastal States shall establish rules and procedures ensuring that such consent will not be delayed or denied unreasonably".

Art. 247 (4) however specifies that a coastal State is entitled to withhold its consent, "in its discretion", (i) if the research project submitted to it is of "direct significance" for the exploration and exploitation of the natural resources of its economic zone or its continental shelf; (ii) if it involves drilling into the continental shelf[82]), the use of explosives, the construction, operation or use of artificial islands, installations, and structures, or the introduction of pollutants into the marine environment; (iii) if the advance information regarding the nature and the objectives of the project, given to the coastal State under Art. 249 of the ICNT[83]), proves to be inaccurate; or (iv) if the researching State has outstanding obligations towards the coastal State from a previous project.

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[81]) In this connexion, Art. 252 further prescribes that: "States shall seek to promote through competent international organizations the establishment of general criteria and guidelines to assist States in ascertaining the nature and implications of marine scientific research".

[82]) According to Art. 81 of the ICNT, "[t]he coastal State shall have the exclusive right to authorize and regulate drilling on the continental shelf for all purposes".

[83]) See *supra*, p. 873.

The consent already granted by the coastal State may be subsequently withdrawn, according to Art. 254[84]), if the research is not being conducted in accordance with the information communicated initially or if the conditions enumerated in Art. 250 (1) of the ICNT[85]) are not met.

The provisions which have thus been summarily described are not, on the whole, very satisfactory, because several of them are either vague, or contradictory, or both. Taking coastal State consent, for example, one will note that Art. 247 (1) and (2)[86]) clearly enunciate the necessity of such consent as a basic rule. From Art. 246 it would seem to result that the grant or refusal of consent lies within the coastal State's discretion, for that Article provides, without indicating any limits, that that State may "regulate" marine scientific research in its economic zone or on its continental shelf. It can be argued, however, that the scope of this discretionary right is limited by Art. 247 (3), which has already been referred to and which prescribes that coastal State consent "shall in normal circumstances" be granted for fundamental marine scientific research conducted for peaceful purposes. This argument is strengthened by Art. 247 (4), which adds that "coastal States . . . may in their discretion withhold their consent" (emphasis added) for resource-related and certain other types of research[87]); this wording suggests, *a contrario,* that for fundamental research carried out for peaceful purposes, coastal States enjoy no such discretion. Whichever be the

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84) This Article provides: "The coastal State shall have the right to require the cessation of any research activities in progress within its exclusive economic zone or on its continental shelf if:

(a) the research project is not being conducted in accordance with the information initially communicated to the coastal State as provided under article 249 regarding the nature, objectives, method, means or geographical areas of the project; or

(b) the State or competent international organization conducting the research project fails to comply with the provisions of article 250 concerning the rights of the coastal State with respect to the project and compliance is not secured within a reasonable period of time".

85) These conditions are set out on pp. 874—875.

86) For the text of these provisions, cf. *supra* note 78.

87) Research involving drilling into the continental shelf or the use of explosives or pollutants; research requiring the construction, operation, or use of artificial islands, installations, and structures; cases where the information initially communicated to the coastal State regarding the nature and objectives of the planned research proves to be inaccurate, or where the researching State has outstanding obligations towards the coastal State from a previous research project. Wherever the expression "resource-related research" is used in the pages that follow, it is meant to include the above-mentioned categories of research.

solution to this riddle, it is of little importance, because the vagueness of the expression "in normal circumstances" contained in Art. 247 (3) virtually robs that provision of any normative value[88]). It is indeed difficult to imagine a situation in which the coastal State would not be in a position to assert that the circumstances surrounding a research project are "abnormal" in some way, and in which it would not be exeedingly difficult for the researching State to disprove such an assertion.

This lack of normative force of Art. 247 (3) is compounded by the doubts which surround the applicability of the compulsory dispute settlement procedures set up by Part XV (Arts. 286 to 297) of the ICNT to controversies on whether the circumstances surrounding a given research project are "normal" or not, or on whether such a project is resource-related or fundamental in character. Indeed, Art. 265 of the ICNT excludes from these procedures:

> "(a) the exercise by the coastal State of a right or discretion in accordance with Article 247; or
>
> (b) the decision by the coastal State to terminate a research project in accordance with Article 254[89])".

Art. 296 (3) (a), which enumerates all the matters which shall be excluded from the compulsory third-party dispute settlement mechanisms to be instituted, confirms Art. 265 by declaring that:

> "when it is alleged that there has been a failure to comply with the provisions of Articles 247 and 254, in no case shall the exercise of a right or discretion in accordance with Article 247, or a decision taken in accordance with Article 254, be called in question" (emphasis added).

Arts. 265 and 296 (3) (a) of the ICNT are ambiguous and, as such, can give rise to contradictory interpretations. In the first instance, it could be argued that if a coastal State, "in its discretion", has refused to agree to a research project, for example because it feels that the project is "of direct significance for the exploration and exploitation of natural resources" (Art. 247 (4) (a) of the ICNT)[90]), this refusal and the qualification on which it is based are final and cannot be verified through

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[88]) This expression, it will be recalled, has its origin in Art. 5 (8) of the 1958 Geneva Convention on the Continental Shelf. For comments on the word "normally" used in Art. 5 (8), see Bouchez, *op.cit. supra* (note 1), pp. 598–599; Brown, *op.cit.* (*supra* note 1), pp. 360–361; McDougal/Burke, *op.cit.* (*supra* note 37), p. 715.

[89]) The text of Art. 254 of the ICNT has been reprinted *supra* note 84.

[90]) Or that it falls into one of the other categories mentioned by Art. 247 (4) and enumerated *supra* note 87.

third-party settlement procedures, because the coastal State was acting "in its discretion" under Art. 247 (4) and because such discretionary acts are not justiciable according to Arts. 265 and 296 (3) (a). To this argument one could object, on the basis of the very same texts, that the "discretion" mentioned by Art. 247 (4) can be exercised by the coastal State only once it has been established objectively — through third-party settlement procedures if necessary — that the project under scrutiny is indeed "of direct significance for the exploration and exploitation of natural resources".

It could be argued in the second place that the right to grant or to refuse consent for marine scientific research in the economic zone or on the continental shelf belongs to those coastal State prerogatives under Art. 247 which are removed from the compulsory dispute settlement procedures by Arts. 265 and 296 (3) (a) of the ICNT. According to this argument, the coastal State's right to grant or to refuse its consent, as set forth in Art. 247 (2), would override the "duty", provided for in para. 3 of the same Article, to agree to fundamental research projects "in normal circumstances"; in other words, the right in question could not be challenged by claiming that coastal State consent must be forthcoming because the project pertains to fundamental research or because the circumstances surrounding it are "normal". It follows that a simple contention, unilaterally put forward by the coastal State, that the proposed research is not "fundamental" or that circumstances are not "normal" would suffice to settle the matter definitively; in practice, the ultimate decision would thus always lie with the coastal State and with that State alone. However, Arts. 247, 265, and 296 also leave room for precisely the opposite interpretation. It will be recalled that, under Arts. 265 (a) and 296 (3) (a), "the exercise of a r i g h t in accordance with Article 247" by the coastal State is excluded from the compulsory dispute settlement procedures set up by Part XV of the ICNT and that Art. 247 (2) contains a general rule granting the coastal State the r i g h t to freely give or refuse its consent to a research project. The exercise of that right by the coastal State is thus a non-justiciable question. Art. 247 (3), which prescribes that the coastal State "shall" give its consent "in normal circumstances" for research projects of a fundamental nature, may be viewed as an exception to, or limitation of, the general right to grant or to refuse consent embodied in Art. 247 (2). As such, it cannot fall under the exclusion stated in Arts. 265 (a) and 296 (3) (a) and will hence remain within the bounds of the dispute settlement procedures to be established by the ICNT.

A final point to be discussed here is the exclusion from these procedures of coastal State decisions "to terminate a research project in accordance with Article 254"[91] (see Arts. 265 (b) and 296 (3) (a) of the ICNT), that is, of decisions to withdraw consent for research in progress which is not being conducted in conformity with the information initially communicated to the coastal State or with the provisions of the Convention. Here again, the lack of precision of Arts. 265 and 296 allows for two contradictory interpretations. On the one hand, it might be argued that decisions to withdraw consent which has already been given are non-justiciable as soon as the coastal State alleges that the withdrawal is based on one of the grounds mentioned by Art. 254. It is also arguable, on the other hand, that the exclusion from compulsory dispute settlement procedures of "decision[s] to terminate a research project in accordance with Article 254" (Art. 265 (b)) only covers withdrawals of consent which objectively meet the conditions set forth by Art. 254 for the termination of the project. Disputes on whether these conditions are fulfilled in a specific case would, according to this line of argument, remain submitted to the compulsory dispute settlement mechanisms provided for by Part XV of the ICNT.

The preceding analysis shows that certain provisions of the ICNT relating to the régime of marine scientific research in the economic zone and on the continental shelf are imprecise and contradictory. It also reveals that the ICNT is concerned almost exclusively with protecting the interests of coastal States as opposed to those of researching States. This is attested by the fact that the rights of coastal States are generally well-defined, while the ICNT becomes vague as soon as the rights of researching States are at stake. This vagueness is particularly conspicuous wherever the Text is dealing with the obligation of coastal States to permit certain types of research or with the judicial determination of this obligation. As has been shown above, the relevant dispute settlement provisions could in fact be interpreted as protecting only the rights of coastal States and as excluding any question connected with the rights of researching States.

In order to restore some balance between the interests of coastal States and those of researching States, it would thus appear necessary to amend at least three provisions of the ICNT along the following lines:

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[91]) For the text of Art. 254, cf. *supra* note 84.

(i) The expression "in normal circumstances" contained in Art. 247 (3) should be deleted[92]), for its maintenance would in practice lead to replacing the freedom of fundamental marine scientific research existing in the areas under consideration[93]) by a system of discretionary consent. Freedom of fundamental research should continue to prevail, possibly in the form of a system of automatic consent, as long as the coastal State's legitimate interests are adequately protected — and this postulate is undoubtedly fulfilled by the many conditions which have to be met by the researching State under the provisions of the ICNT.

(ii) Art. 265 should make it perfectly clear that disputes pertaining to the discretion of the coastal State under Art. 247 (4) or to the rights of that State under Arts. 247 and 254 are not excluded from the compulsory settlement procedures to be established by the future Law of the Sea Convention as long as the very existence of such a discretion or of such rights is in doubt. This objective could be reached by the following re-formulation of the second phrase of Art. 265:

> ". . . the coastal State shall not be obliged to submit to such settlement any dispute arising out of the exercise, by the coastal State, of a right in accordance with Articles 247 and 254, or of its discretion under Article 247 (4), except if the dispute relates to the question of whether the conditions set forth by Articles 247 and 254 for the exercise of such a right or of such discretion are fulfilled".

(iii) Art. 296 (3) (a) should be amended along the same lines, and letter (b) of that provision should be deleted[94]).

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92) This would, in turn, necessitate the deletion of the last sentence of Art. 247 (3): "To this end [of granting their consent 'in normal circumstances'], coastal States shall establish rules and procedures ensuring that such consent will not be delayed or denied unreasonably".

93) As was shown *supra*, pp. 864—866, such freedom exists, under customary international law, in the marine areas located beyond the territorial sea, the only limitation being that its exercise should not interfere unduly with the lawful uses of the sea by other States, in particular the resource rights enjoyed by coastal States on their continental shelves. For the situation under the 1958 Geneva Convention on the Continental Shelf, see *supra*, pp. 859—864.

94) The text of Art. 296 (3) (a) has been reproduced *supra*, p. 877. Letter (b) of Art. 296 (3) adds that "the court or tribunal [provided for by the articles of the ICNT on dispute settlement] shall not substitute its discretion for that of the coastal State".

2.5. The High Seas, Including the International Seabed Area

Although Art. 2 (1) of the 1958 Geneva Convention on the High Seas fails to mention it expressly, the freedom of conducting marine scientific research is undoubtedly one of the freedoms of the high seas. This freedom, which also covers research on the seabed and subsoil beyond national jurisdiction[95]), finds its only limitation in Art. 2 (2) of the High Seas Convention, which, as already noted, specifies that the freedoms of the high seas

> "shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas".

However, the creation of an international seabed area and régime, and the characterisation of that area as a "common heritage of mankind" by Art. 136 of the ICNT[96]), will inevitably lead to some modifications in the existing legal situation.

Art. 87 (1) (f) of the ICNT provides that there shall be freedom of marine scientific research on the high seas subject to the relevant provisions of the ICNT in the matter, and Art. 258 of the ICNT prescribes that in the water column superjacent to the area beyond the 200-mile limit, all "States . . . as well as competent international organizations" shall have the right to engage in marine scientific research; the same right must be taken to exist in the superjacent air space. A question that arises in relation to this Article is whether the expression "States . . . as well as competent international organizations" is intended to exclude the conduct of research by private institutions and individuals. This problem will be discussed below in connexion with the liability and international responsibility arising from injuries caused by the conduct of marine scientific research[97]).

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[95]) And research in the air space above the high seas as well, cf. Bouchez, *op.cit.* (*supra* note 1), p. 607, and Menzel, *op.cit.* (*supra* note 26), p. 629.

[96]) "The Area and its [mineral] resources are the common heritage of mankind". In this connexion, one may recall the characterisation of outer space and of the celestial bodies as "the province of all mankind", cf. Art. I (1) of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty), opened for signature on 27 January 1967, UNTS, vol. 610, p. 205. However, the legal content of this concept substantially differs from that of the "common heritage of mankind". This is hardly surprising, for the international seabed area is considered to be an important reservoir of exploitable natural resources, while outer space and the celestial bodies are not (yet) so regarded.

[97]) See *infra*, pp. 891–893.

Activities of exploration (and exploitation) in the international seabed area, *i.e.* on the ocean floor beyond the outer limits of the continental margin, shall in principle be placed under the jurisdiction of the International Seabed Authority[98]), while marine scientific research in the area, "carried out exclusively for peaceful purposes and for the benefit of mankind as a whole", shall be open to States or "competent" international organisations, including the Authority, and to entities or persons who have entered into a contractual arrangement with the Authority. This régime is the result of Arts. 257 and 151 (7) of the ICNT. Art. 257 provides:

> "States, irrespective of their geographical location, as well as competent international organizations, shall have the right ... to conduct marine scientific research in the Area",

and Art. 151 (7) declares that:

> "[t]he Authority shall carry out marine scientific research concerning the Area and its resources, and may enter into contracts for that purpose. The Authority shall promote and encourage the conduct of marine scientific research in the Area, harmonize and co-ordinate such research, and arrange for the effective dissemination of the results thereof".

While the second sentence of Art. 151 (7) no doubt has its uses, it fails to resolve possible conflicts between different research projects and, more importantly, the conflicts that could arise between research activities on the high seas or in the international seabed area and activities of exploration or exploitation in that area or on the continental shelf outside the 200-mile limit[99]).

3. The Legal Status of Research Facilities and Personnel

3.1. Introduction

The question to be discussed here is: Who has jurisdiction over the facilities used for the conduct of marine scientific research and over the personnel operating these facilities? Among the facilities which are used for research, a distinction must be drawn between vehicles such as

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[98]) This results from Art. 151 (1) of the ICNT read in conjunction with Art. 133 (a).

[99]) None of these conflicts find adequate solutions in Arts. 241 (c) and 247 (5) of the ICNT, which merely provide that marine scientific research activities shall not "unjustifiably interfere" with other legitimate uses of the sea, in particular with the exercise, by coastal States, of their sovereign rights and their jurisdiction.

vessels, aircraft, and spacecraft, and more static devices such as artificial islands, installations (including data-collecting buoys), and structures. The jurisdictional status of these facilities must, in turn, be distinguished from that of the personnel manning them. Jurisdiction over each of these two categories of facilities and over their personnel in each maritime zone may finally differ according to whether the said facilities or personnel depend from private entities or persons or from a State or an international organisation.

3.2. Internal Waters

The virtually complete sovereignty of the coastal State over its internal waters[100]) enables that State to exercise full jurisdiction over private foreign research facilities and personnel operating in or above these waters, though the coastal State is naturally free to decide if and to what extent it wishes to exercise such jurisdiction. However, coastal State jurisdiction suffers an important restriction on account of the principle of sovereign immunity: except for a request to leave the internal waters, no enforcement measures may be taken by the coastal State against non-commercial ships operated by foreign States[101]) or international organisations. This rule could, it seems, be extended to artificial islands, installations or structures, and to their personnel, unless the authorisation given by the coastal State to operate in its internal waters contains or at least implies a waiver of the rule of sovereign immunity. The restrictions on coastal State jurisdiction which might thus flow from sovereign immunity are however compensated for by the liability and international responsibility incurred by the researching State or organisation for injuries unlawfully caused by the use of the research facility or by the personnel manning it.

3.3. Territorial Sea, Straits, and Archipelagic Waters

As pointed out earlier[102]), marine scientific research undertaken by foreign vessels traversing the territorial sea is not covered by the concept of "innocent passage". Accordingly, private foreign vessels conducting research in the territorial sea will not benefit from the special rules

[100]) See *supra*, p. 854.
[101]) Cf. Gidel, *op.cit.* (*supra* note 21), vol. II, pp. 252 ff.
[102]) See *supra*, pp. 855–856.

pertaining to criminal and civil jurisdiction during the exercise of the right of innocent passage[103]) but will fall under the coastal State's unrestricted jurisdiction[104]). As in the case of internal waters, coastal State jurisdiction is limited by the principle of sovereign immunity, and the only enforcement measure which can be taken against non-commercial vessels operated by a foreign State or an international organisation seems to be a request to leave the territorial sea[105]). This rule, it appears, is equally applicable to objects in the air space superjacent to the territorial sea. The jurisdictional restrictions flowing from the principle of sovereign immunity are however counter-balanced by the liability and international responsibility incurred by the State operating the ship or aircraft.

Marine scientific research in the territorial sea can also be conducted by means of artificial islands, installations, and structures[106]). As these devices cannot be assimilated to either vessels or naturally-formed

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[103]) See the rules contained in Arts. 19 and 20 of the Territorial Sea Convention and Arts. 27 and 28 of the ICNT.

[104]) Art. 17 of the Convention on the Territorial Sea, which undoubtedly reflects a customary rule, prescribes that "[f]oreign ships exercising the right of innocent passage shall comply with the laws and regulations enacted by the coastal State in conformity with these articles and other rules of international law . . .". *A fortiori* such ships must comply with coastal State laws when they are not exercising the right of innocent passage but are carrying out marine scientific research in the territorial sea by permission of the coastal State.

The corresponding provision of the ICNT — Art. 21 — differs from Art. 17 of the Territorial Sea Convention in that it enumerates the matters on which the coastal State may legislate in relation to the innocent passage of foreign ships. Even here, however, an *a fortiori* argument seems possible: if the coastal State is entitled to legislate in relation to marine scientific research conducted when the foreign vessel is passing through the territorial sea — cf. Art. 21 (1) (g) — it follows *a fortiori* that it may do the same for research that is being carried out by a vessel stationed in the territorial sea with the coastal State's permission. This conclusion is also warranted by the fact that the territorial sea is placed under the territorial sovereignty of the coastal State, except as regards the right of innocent passage of foreign vessels. Accordingly, foreign ships which conduct marine scientific research in the territorial sea and do not exercise the right of innocent passage are completely subjected to coastal State sovereignty; their status is the same as in internal waters and ports, cf. Gidel, *op.cit.* (*supra* note 21), vol. III, pp. 274–277.

[105]) Cf. Arts. 23 and 22 (2) of the Territorial Sea Convention. See also Arts. 32 and 30 of the ICNT and Gidel, *op.cit.*, vol. III, pp. 287–289.

[106]) See Münch, *infra* pp. 933 ff.

islands[107]), and as neither the 1958 Geneva Conventions nor the ICNT contain express provisions pertaining to jurisdiction over them, the question must be solved by applying the general rule according to which the coastal State exercises full jurisdiction over its territorial sea, except for the right of innocent passage of foreign vessels. In the absence of contrary treaty provisions, privately-sponsored foreign research facilities and personnel are thus subject to coastal State jurisdiction; this equally holds true for facilities operated by a foreign State or an international organisation and their personnel, except for the fact that, on account of the principle of sovereign immunity the only enforcement action that can be taken against them is a request for their removal. This immunity is counter-balanced by the liability and international responsibility of the State or organisation operating the facility for injuries caused in violation of the laws of the coastal State or of international law.

By and large, these rules seem to be maintained by Art. 246 of the ICNT which, as already noted[108]), empowers the coastal State to make marine scientific research in its territorial sea dependent on conditions and to regulate its conduct. It would nonetheless appear desirable to complete this Article by spelling out the rule that jurisdiction over foreign research facilities and personnel in the territorial sea in principle belongs to the coastal State.

As pointed out above[109]), straits and archipelagic waters are largely assimilable to the territorial sea as regards the conduct of marine scientific research. It may thus be assumed that the rules identified earlier also cover jurisdiction over research facilities and personnel operating in or above straits and archipelagic waters.

3.4. The Continental Shelf and the Future Economic Zone

3.4.1. The *lex lata*

As has been shown[110]), the sovereign rights of the coastal State over the natural resources of its continental shelf shall not affect the status of the superjacent water and air spaces as parts of the high seas (Art. 3

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[107]) H. Charles, Les îles artificielles, Revue générale de droit international public, vol. 71 (1967), pp. 342–368, at pp. 347–351.

[108]) *Supra*, p. 856.

[109]) *Supra*, pp. 856–859.

[110]) *Supra*, p. 860.

of the 1958 Continental Shelf Convention). This rule, it was noted[111]), is one of customary law. Both Art. 6 (1) of the Geneva Convention on the High Seas[112]) and customary law[113]) also provide that vessels on the high seas are in principle placed under the exclusive jurisdiction of their flag State, and a similar solution — exclusive jurisdiction of the State of registry — would seem to govern aircraft and spacecraft[114]). It follows from the above that foreign research vehicles conducting marine scientific research on or above the continental shelf are submitted to the exclusive jurisdiction of their flag State or State of registry. This rule would appear to be applicable even when the issue is whether the vehicle or its personnel has complied with the conditions imposed or regulations lawfully enacted by the coastal State; if the flag State or State of registry omits to enforce these conditions or regulations against its own vessels, aircraft, or spacecraft, it may however incur international responsibility towards the coastal State.

The situation is less certain and more complex when the research facilities used are artificial islands, installations, or structures, *i.e.* devices which qualify neither as vessels nor as naturally-formed islands. Even if it is assumed that the planned research meets with the coastal State's approval — should such approval be necessary — two questions will arise: (i) Is it lawful to establish and operate such relatively static facilities on the high seas? And in the event of an affirmative answer to question (i): (ii) Who will have jurisdiction over these facilities and their personnel?

The answer to be given to question (i) depends on whether the temporary occupation of even a small fraction of the high seas by such facilities is compatible with the freedom of the high seas and its complement, *i.e.* the idea that, the high seas being a *res communis omnium,* no part thereof may be subjected to the sovereignty of any State (Art. 2 (1) of the High Seas Convention). It would seem, however, that the lawfulness of such an ephemeral occupation is inherent in the freedom of marine

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111) *Supra,* pp. 864, 866.

112) "Ships shall sail under the flag of one State only and, save in exceptional cases expressly provided for in international treaties or in these articles, shall be subject to its exclusive jurisdiction on the high seas . . .". The same rule can be found in Art. 92 (1) of the ICNT.

113) See Gidel, *op.cit.* (*supra* note 21), vol. I, pp. 235 ff.

114) By virtue of Art. VIII of the Outer Space Treaty, which confers "jurisdiction and control" over objects launched into outer space, and over any personnel thereof, on the State of registry.

scientific research implicitly guaranteed by Art. 2 (1) of the High Seas Convention, at least as long as the occupation is effected "with reasonable regard to the interests of other States in their exercise of the freedom of the high seas" (Art. 2 (2) of the High Seas Convention).

The answer to the first question thus being in the affirmative, it becomes necessary to reply to question (ii): Who is to exercise jurisdiction over artificial islands, installations, or structures used for scientific research, and over their personnel? If the research is being undertaken by a State, jurisdiction would seem to lie with that State. If it is conducted by a private institution or by individuals, however, a difficulty arises: not being assimilable to vessels or aircraft, the facilities in question may well remain unregistered, and the criteria of the flag or of registry will hence be useless. In order to attribute jurisdiction to some State, it may therefore become necessary to look for other connecting factors such as the nationality of the owners of the facility or of the personnel involved, as the case may be. It should be added that this necessity may arise, not only in connexion with facilities used for marine scientific research, but for artificial islands, installations, and structures on the high seas in general, for the Geneva Conventions of 1958 have failed to deal with the problem [115]).

3.4.2. The provisions of the ICNT

Art. 247 (1) of the ICNT declares that coastal States are entitled to regulate the conduct of marine scientific research in their economic zones and on their continental shelves; according to Art. 259, this right extends to the deployment and use of research installations and equipment. The ICNT adds that such installations and equipment shall in no way influence the delimitation of maritime zones (Art. 260) or obstruct established international shipping routes (Art. 262), and that safety zones of a reasonable width, not exceeding 500 metres, may be created around scientific research installations (Art. 261). It finally provides, in its Art. 263, that installations and equipment for marine scientific research

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[115]) On artificial islands, see Münch, *op.cit.* (*supra* note 106) and, for instance, Charles, *op.cit.* (*supra* note 107); D. H. N. Johnson, Artificial Islands, International and Comparative Law Quarterly, vol. 4 (1951), pp. 203–215; W. Riphagen, International Legal Aspects of Artificial Islands, International Relations, vol. 4 (1972–1974), pp. 327–347.

"shall bear identification markings indicating the State of registry or the international organization to which they belong and shall have adequate internationally agreed warning signals to ensure safety at sea and the safety of air navigation . . .".

This summary description shows that unfortunately the rules of the ICNT fail to deal exhaustively with the question of who shall have general jurisdiction over research facilities or personnel in the future economic zone or on the continental shelf.

The problem is solved easily for marine scientific research conducted by vessels: in the economic zone, such vessels are to be treated like other foreign ships. Indeed, it follows from Art. 58 (2) of the ICNT[116]) that Art. 92, which provides for flag State jurisdiction over vessels on the high seas[117]), shall in principle apply to ships in the economic zone. The same is true for vessels in the waters superjacent to the continental shelf outside the 200-mile limit, for, according to Arts. 78 and 86 ICNT, these waters form part of the high seas.

The ICNT contains no express provisions on the status of aircraft and space objects over the high seas. The general rules of international law however suggest that jurisdiction over research aircraft, their passengers, and their crew must lie with the State of registry; under Art. VIII of the Outer Space Treaty, the same solution applies to spacecraft.

The ICNT contains no specific provisions on jurisdiction over artificial islands, installations, and structures used for marine scientific research in the economic zone. The matter is therefore governed by Art. 60 of the ICNT, which deals with the status of artificial islands, installations, and structures in the economic zone in general. Para. 2 of Art. 60 provides:

"The coastal State shall have exclusive jurisdiction over . . . artificial islands, installations and structures, including jurisdiction with regard to customs, fiscal, health, safety and immigration regulations"[118]).

According to Art. 80 of the ICNT, this rule "applies *mutatis mutandis* to artificial islands, installations and structures on the continental shelf".

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[116]) This Article provides that Arts. 88 to 115 of the ICNT, relating to the high seas, shall apply in the economic zone unless they are incompatible with the rules governing that zone.

[117]) See *supra* note 112.

[118]) This provision makes no express mention of jurisdiction over the persons manning these devices, but the omission appears to be unintentional. Accordingly, Art. 60 (2) of the ICNT can be taken to cover the personnel operating the devices in question.

The use of the term *"mutatis mutandis"* may be taken to suggest that the rule of Art. 60 (2) must be applied strictly within the limits of the sovereign rights enjoyed by the coastal State over its continental shelf. Specifically, this means that beyond the 200-mile limit, the rule of Art. 60 (2) — exclusive coastal State jurisdiction — will be applicable only to facilities which are implanted on, or connected with, the continental shelf and which are to serve for activities reserved to the coastal State, *i.e.* for the exploration and exploitation of the shelf's natural resources. As this is not the case for facilities used in connexion with marine scientific research, it must be concluded that the provision of Art. 60 (2) will not apply to artificial islands, installations, and structures located beyond the 200-mile limit, or to their personnel, if they are used exclusively for fundamental marine scientific research. The ensuing gap in the ICNT is not entirely filled by Art. 263, which states that installations and equipment used for marine scientific research "shall bear identification markings indicating the State of registry . . ." but omits to specify that registry entails an attribution of jurisdiction. This could be remedied by expressly providing for such an attribution in Art. 263.

3.5. The High Seas, Including the International Seabed Area

If one excepts the question of the jurisdictional status of research facilities used for resource-related activities and implanted on, or connected with, the continental shelf beyond the 200-mile limit — this problem has already been dealt with[119]) — the rules applicable *de lege lata* to research facilities and personnel on or above the high seas would seem to be the following: research vessels, aircraft, and spacecraft, and their passengers and crew, are placed under the exclusive jurisdiction of the flag State or of the State of registry. Artificial islands, installations, and structures[120]) used for marine scientific research, and the personnel manning them, would presumably be submitted to the jurisdiction of the State of registry. If the facility is not registered, the nationality of its owners or of its personnel may have to be considered.

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[119]) See *supra.*

[120]) According to Art. 87 (1) (d), there shall be freedom to construct "artificial islands and other installations" on the high seas, subject to the provisions of the ICNT on the continental shelf.

The ICNT makes no change in the existing rules on jurisdiction over vessels, aircraft, and spacecraft on or above the high seas. The only important issue which remains unsolved is the jurisdictional status of vehicles of the International Seabed Authority or of the personnel operating them[121]). As has been pointed out in connexion with the status of research facilities located on or above the continental shelf beyond the 200-mile limit, the ICNT fails to solve the question of the jurisdictional status of artificial islands, installations, and structures, and of their personnel. On the one hand, it contains no general provisions on jurisdiction over such facilities on the high seas. On the other hand, Art. 263 of the ICNT limits itself to prescribing that research installations and equipment "shall bear identification markings indicating the State of registry", without drawing the necessary consequences in matters of jurisdiction. Art. 263 should thus be amended so as to make it clear that jurisdiction over such installations and equipment on the high seas belongs to the State of registry.

4. Liability and International Responsibility for Injuries Resulting from Marine Scientific Research

The problem to be examined here is the following: Who is liable under domestic law and who bears international responsibility for injuries caused by research activities in violation of the applicable rules of national and international law? This question will be envisaged from the angle of the existing rules on the subject as well as from that of the ICNT.

Under the existing rules of international law, marine scientific research is open to foreign States and international organisations as well as to private institutions and individuals. In other words, there is no research monopoly in favour of States and international organisations. Accordingly, liability for injuries unlawfully caused in the course of research activities will lie with whoever is conducting them. International responsibility can arise for the researching State only in the following three

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121) Art. 93 of the ICNT, which deals only with the status of ships on the high seas, provides: "The preceding articles [in particular the provision on flag State jurisdiction] do not prejudice the question of ships employed on the official service of the United Nations, its specialized agencies or the International Atomic Energy Agency, flying the flag of the Organization".

This rule, which could be interpreted as conferring flag jurisdiction on the organisations belonging to the United Nations family, does not cover the Authority, for the latter will not have the status of a special agency of the United Nations.

situations: (i) the research is being undertaken by the researching State itself, and the injury has been inflicted directly on the coastal State; (ii) although the research is being carried out by private persons, the injury is due to the lack of diligence shown by the State with which they are connected[122]); (iii) a private institution or an individual seeking reparation for injuries resulting from research activities has suffered a denial of justice in the courts of the researching State.

Similar rules apply to injuries caused by the coastal State to foreign States, institutions, or individuals carrying out research. Thus, liability for injuries inflicted on foreign States, institutions or individuals will lie with whoever has behaved unlawfully. The coastal State's international responsibility may arise in the following three situations: (i) an injury imputable to the coastal State itself directly affects the rights of another State which is conducting marine scientific research; (ii) although it was caused by a private institution or by individuals, the injury is imputable to the coastal State because it is the consequence of a lack of due diligence on the part of that State; (iii) foreign entities or individuals who claim reparation for injuries suffered while conducting research have suffered a denial of justice in the courts of the coastal State.

These rules are based on the principle that the conduct of marine scientific research is open to private institutions and to individuals as well as to States. Arts. 239 and following of the ICNT seem to modify this principle by limiting the right to conduct marine scientific research to States (and "competent" international organisations)[123]). The institution of a research monopoly in favour of States and the ensuing exclusion of private institutions and persons would lead to the consequence that injuries unlawfully caused in the course of marine scientific research are always imputable to the researching State. Art. 264 of the ICNT, which deals with the questions of liability and of inter-

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[122]) That is (see *supra*, p. 889), the national State of the owner(s) of the facility or of the individuals operating it, as the case may be. The lack of due diligence on the part of the researching State may consist, for example, in a failure to ascertain the seaworthiness of a privately-operated research vessel flying its flag, provided the injury results from such failure.

[123]) Art. 239 reads: "States, irrespective of their geographical location, and competent international organizations have the right to conduct marine scientific research subject to the rights and duties of other States as provided for in the present Convention".

national responsibility [124]), however throws some doubt on the intention of the authors of the ICNT to create a State monopoly in matters of marine scientific research. While para. 1 of Art. 264 provides that States

> "shall be responsible for ensuring that marine scientific research, whether undertaken by them or on their behalf, is conducted in accordance with the present Convention"

and thus does not contradict the idea of a State monopoly, the same cannot be said of para. 2. Art. 264, para. 2, makes the coastal States

> "responsible and liable for the measures they undertake in contravention of the present Convention in respect of marine scientific research activities conducted by other States, their natural or juridical persons or by competent international organizations . . ." (emphasis added).

The mention of "natural or juridical persons" conducting marine scientific research activities leads to the conclusion that such activities are to remain open to foreign private institutions and individuals. This conclusion is supported by the use of the word "liable", which suggests that the coastal State may be accountable to the said institutions or persons rather than to the foreign State with which they are connected.

It would seem reasonable to conclude from the somewhat inconsistent provisions described above that the authors of the ICNT had no intention of creating a State monopoly in matters of marine scientific research. What they may have had in mind is a system in which marine scientific research can be undertaken by States as well as by private institutions and individuals, provided they have, where necessary, obtained the coastal State's consent through a request submitted on their behalf by the State with which they are connected [125]). If this is indeed

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[124]) The complete text of Art. 264 is as follows: "1. States and competent international organizations shall be responsible for ensuring that marine scientific research, whether undertaken by them or on their behalf, is conducted in accordance with the present Convention.

2. States and competent international organizations shall be responsible and liable for the measures they undertake in contravention of the present Convention in respect of marine scientific research activities conducted by other States, their natural or juridical persons or by competent international organizations, and shall provide compensation for damage resulting from such measures.

3. States and competent international organizations shall be responsible and liable pursuant to the principles set forth in article 236 [on damage caused to the marine environment] for damage arising out of marine scientific research undertaken by them or on their behalf".

[125]) Such a solution would be similar to the system which was instituted by the rules of customary international law, by Art. 4 of the 1958 High Seas Convention, and by Art. 90 of the ICNT, and under which "[e]very State . . . has the right to

what is intended by the authors of the ICNT, the text of Arts. 239 and following should be clarified. If the intention is to institute a strict State monopoly in matters of research, on the contrary, Art. 264 (2) of the ICNT must be amended[126]). In this connexion, it should be added that in the long run the creation of such a monopoly may be objectively detrimental to the interests of the international community as a whole, for the bureaucratisation that would inevitably ensue would stifle the progress of marine science. It is therefore preferable to continue to encourage private initiative in the field through a system under which coastal State consent, where required, is secured by the State with which the scientists are connected. The latter State would thus inevitably become involved with the research project. This should not, however, entail the consequence that it becomes automatically liable and responsible for every injury that may be caused during the execution of the project. The distinction drawn by Art. 264 of the ICNT between liability and international responsibility should therefore be maintained. It is however desirable to clarify this distinction by an enumeration, along the lines indicated above, of the instances in which the researching or the coastal State will incur international responsibility.

B. The Legal Régime of Marine Scientific Research: A Scientist's Viewpoint

As a rule, scientists are not unduly preoccupied by legal problems. As long as they are being provided a microscope, an oscilloscope, a lunar module, or a bathyscaph, their attention will be riveted on their scientific inquiry. They will set out to explore outer space or the great

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sail ships under its flag on the high seas". The fact that this right is attributed to the State does not mean that international law has established a State monopoly over navigation on the high seas. The conditions under which private vessels may navigate on the high seas are determined by the laws of the flag State, and the injuries that such ships may cause are not automatically imputable to the flag State. Automatic imputability only exists in the case of ships operated by the State itself.

[126]) It is the reference to coastal State liability towards "natural or juridical persons" of other States which should be deleted, for if marine scientific research becomes a State monopoly, any liability will lie directly towards the researching State.

The question of State research monopolies in Antarctica and in outer space is discussed by G. Ringeard, Scientific Research: From Freedom to Deontology, Ocean Development and International Law Journal, vol. 1 (1973), pp. 121–136, at pp. 126–127.

trenches of the world's oceans without worrying too much whether and pursuant to what rules they are legally entitled to do so; for them, research is governed by the law of Newton or Archimedes' principle rather than by rules of law. For the scientist boundaries existed on paper only, and territorial limits were meaningless to him; the only limits he had to acknowledge were the laws of nature and, unfortunately, the scarcity of the research funds available to him. All the other matters could be solved in an office and did not take up too much of his time.

But all of a sudden, the scientist's work is being restricted by rules of law as well. Maritime boundaries are being established at a distance of 200 miles from the coastline, and scientists, especially oceanographers, are about to be addressed in the following way:

> "You may not enter these waters without having requested and obtained the authorisation to do so by filling out at least seven forms, each of which has a different colour and bears the seal of all the administrative services concerned (the navy, the bureau of counter-espionage, social, economic, environmental, commercial, and research and development services, and possibly other offices as well). You may not dive in our waters except if supervised by one of our people; you may only use sounding-lines which bear our mark; more generally, you may do nothing we are unable to understand, and you may not tell anything to anyone without informing us first and before we have made sure that the information concerned is of no use to anybody but us. You shall initiate us into the mystery of the black boxes you carry; and you shall further allow us to disassemble and copy them, or give us similar boxes. Finally, you shall warn us six months or one year in advance, as decided by us in each individual case, whenever you intend to approach our shores, and you shall submit in advance to the jurisdiction of our courts in the event of your being accused of having disregarded our laws or other measures taken by us".

What should be the scientist's answer to such an admonition? Despite his evident wish to cooperate with all the nations of the world, despite his desire to exchange information, discoveries, and ideas across the boundaries and the oceans and to contribute to the technological development of other countries, is there not the danger that the fear of breaking laws which are unknown to him or the possibility that the industrial or military leaders of his own country might misuse the results of his research will cause the scientist to abandon his marine scientific research and make him turn to other, less regulated activities? And would this danger not gradually lead to a total dereliction of the field of marine scientific research? Is there not a fundamental contradiction between the attempt made by the Third United Nations Conference

on the Law of the Sea to enact restrictive rules on every aspect of such research and the scientist's traditional dedication to his research?

During the age of discoveries and of the establishment of white supremacy, the Western powers and their traditional allies over-colonised and over-exploited a large part of the world. In so doing, they earned for themselves a solid dose of hatred and, above all, mistrust. The mistrust is so deep-seated that their promises are no longer taken seriously. At the same time, the balance of power has shifted. Raw materials can no longer be simply appropriated but must be bought; moreover, a political price as well as a sales price must be paid for them. The Western powers and their allies have thus been forced to discuss, to negotiate, and to compromise; they have no reason for complaining about this situation, however, for they are merely reaping the fruits of what they have sown a long time ago, particularly during the past century.

A point to be mentioned in this connexion is that the continued existence of a rule of international law is conditional upon its effectiveness. In essence, this reliance on effectiveness amounts to an acknowledgement of the power of those who enact and subsequently enforce the rule. In the last analysis, law is respected because of the power of those who have made it and because of the policeman who enforces it; and the policeman commands respect because he carries a stick and because reinforcements are waiting back at police headquarters. In a certain sense this is even true in democratic societies, which abide by the rules established and enforced by the majority of the constituency.

These ideas are applicable to international law as well, and to the Law of the Sea in particular: the States which, within the framework of the Third United Nations Conference on the Law of the Sea, are about to impose their will — the coastal States, especially those among them which are developing countries — constitute a majority; many of them must also be viewed as being among the most "powerful" States because they control oil fields and deposits of uranium, nickel, manganese, and copper.

However, there might soon be a shortage of land-produced oil, nickel, manganese, and copper, hence the idea of obtaining these minerals by exploiting the resources of the seabed in coastal areas and by harvesting the billions of tons of polymetallic nodules discovered by scientists on the great abyssal plains of the Pacific Ocean at depths reaching four to six kilometres. The harvesting of these nodules is made possible by technology; it has been argued by technologically advanced countries that, as they belong to nobody, any one is free to appropriate them.

Other countries, notably those which have recently become independent, see the question in a different light. They admit that the nodules belong to no one in particular, but the conclusion drawn from this admission is that no one may appropriate them. The economic motivation underlying this conclusion is that if the technologically advanced States are allowed to exploit the polymetallic nodules of the deep-seabed, this will hurt the economy of the States which are land producers of the minerals contained in the nodules and which are mostly developing countries; its political motivation is that because the minerals produced on land by these countries will be needed no longer, no one will listen to them any more. These reasons explain the claim that the seabed beyond the limits of national jurisdiction should be turned into a "common heritage of mankind". In the view of its authors, this concept implies that the deep-seabed beyond the limits of national jurisdiction belongs to no one in particular but to the international community and, within that community, to those who dominate it and thus are able to make their will prevail.

In addition, the developing coastal States as well as some industrial nations with particularly favourable coastlines advocate an extension of the limits of their national maritime jurisdiction by claiming exclusive resource rights within a 200-mile belt of marine space around their land territory as well as over seabed areas adjacent to their coasts and extending to the outer edge of the continental margin. As has been noted by many, the acceptance of such claims would rob the idea of the seabed's being a "common heritage of mankind" of a great deal of its substance.

It follows from the above that those who wish to exploit the seabed's natural resources will have to secure permission to do so from either the coastal State or the international community as represented by the International Seabed Authority, and to pay the fees and contributions claimed by the latter, so as to atone for the knowledge and the technology they have had the audacity to develop.

The technologically advanced nations alone are capable of effectively exploiting the natural resources of the seabed. They are however too isolated and, hence, too weak to impose their views on the majority and thus are on the verge of accepting the inevitable by saying:

> "Very well, a 200-mile belt and the continental margin adjacent to your coasts shall henceforth fall under your exclusive resource jurisdiction, and you, in turn, shall be bound to respect o u r resource jurisdiction over such areas near o u r coasts. As far as the exploration and exploitation of the natural resources of the deep-seabed is concerned, we are now ready to seek your

permission and to pay the fees prescribed by you in order to be able to exploit resources which hitherto did not belong to anyone in particular and which are now considered as belonging to all".

One thus notes that, with the widening of the marine spaces which are about to be placed under the resource jurisdiction of the coastal State and with the deep-seabed's becoming the "common heritage of mankind", all exploration and exploitation activities will call for permission to be given by either the coastal State or the community of the States forming the International Seabed Authority; paradoxically, more often than not the grant of this permission will depend on the approval of those States which themselves lack the necessary knowledge and technology to explore and exploit.

This paradox is due to the fact that it is precisely these underprivileged States which will have the necessary political power to impose the rules which are presently submitted to the Third United Nations Conference on the Law of the Sea. The technologically advanced States try to prevent their adoption with all the means at their disposal, but these means are either too inadequate or too terrifying to be used.

The consequences of the developments described above for the marine scientist are alarming. As noted above [127]), research carried out beyond the limits of national (resource) jurisdiction, while free in principle, may interfere with activities of exploration or exploitation conducted on the deep-seabed by the International Seabed Authority or under its auspices and may thus be subjected to limitations. As far as research undertaken by one State within the 200-mile economic zone or on the continental margin of another State is concerned, it will henceforth depend on the consent of the latter State and have to be conducted in accordance with the legislation enacted and the conditions imposed by it, even if the project is demonstrably one of *bona fide* fundamental oceanographic research. This being the content of the rules which are at present submitted to the Third United Nations Conference on the Law of the Sea, the legal régime of marine scientific research may evolve in two different ways.

It is possible, in the first instance, that the States forming a majority within the Conference will eventually attain their objectives, with the probable consequence that marine scientific research activities will diminish drastically for an unforeseeable period.

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[127]) See p. 882.

A second possibility is that some technologically advanced States will continue to uphold the idea of freedom of scientific research and even go to the extreme of refusing to accede to a future Law of the Sea Convention if this idea is not preserved in some way. However, as most members of the international community will undoubtedly ratify such a Convention because it reflects their current views, the few States which remain attached to the freedom of marine scientific research will gradually become outsiders. For some time, they will no doubt attempt to persist in their old ways and cling to the rules of the past, but ultimately this attempt is doomed to fail under the pressure of the rules contained in the Convention, rules which in fact discriminate against those who have the knowledge, technology, and initiative necessary to conduct research work although they have allegedly been adopted in order to fight discrimination in the field of marine scientific research.

Admittedly, the stability of any new international order of the seas depends on its effectiveness and hence on the power of those who have established it. For those who suffer from it, the tragedy of the present situation is that the balance of power constantly changes, and so does the identity of those who are called upon to enforce that order. The new Law of the Sea, like the old, will be a legal order set up by those who have the necessary power to do so; this time, however, the new order is being forced on those States which, during a long period of history, have grown accustomed to make their own views prevail in the four corners of the world.

The problems discussed above would never have arisen in their present form without the urgent need of the industrialised States for oil, uranium, or copper. Thus, the roots of the present situation may well lie in the creativity displayed by these States and their ensuing need for mineral resources. Is it not likely, however, that the rules which are now being established mainly by the developing members of the international community will hamper t h e i r activities once their industrialisation has progressed sufficiently? And is it not to be expected that, as a result of this progress, the newly industrialised States will claim freedom of marine scientific research? It would therefore appear objectively desirable that the rules of international law on marine scientific research remain in a state of flux for at least another ten or twenty years, for if they do not, they will once again become unsatisfactory for all within a very short time.

What is true for the legal régime of marine scientific research may well be true for the Law of the Sea in general. The growing inter-

dependence of the members of the international community is undisputed, and this interdependence is likely to increase in the years to come. The developing countries will continue to depend on the assistance of the industrialised nations for their economic development, while the latter will continue to need the former's natural resources and markets in order to manufacture and sell their products. Hence, a weakening of the industrialised States will automatically entail a weakening of the developing countries, and vice versa. The world no longer is a place where isolated tribes can make war on one another without any impact on the fate of mankind; and peace will be preserved only if the interdependence between the members of the international community reaches a point where even an infinite weakness on the part of one actor has automatic repercussions on the actor who has — even in a remote way — contributed to the initial weakness.

A Law of the Sea remaining in a state of uncertainty would enable the world to survive the troubled period which it is traversing at present. If this period were followed by one of greater stability, it might then become possible to remove most of the restrictions to marine scientific research envisaged by the Third United Nations Conference on the Law of the Sea and to remember that the sea is and remains a large and beautiful expanse of water which should be enjoyed, contemplated, and studied with complete freedom.

C. Conclusion

Different as they may appear to be, the analysis of the legal framework for marine scientific research presented in this paper and the appraisal of this framework by a marine scientist nevertheless yield some common conclusions.

The first conclusion is that the quantity and the apparent complexity of the provisions of the ICNT devoted to marine scientific research cannot conceal the main objective of these provisions, which is to place large parts of the world's oceans under the research jurisdiction of the coastal State. This jurisdiction may become virtually exclusive owing to the possible absence of compulsory dispute settlement procedures protecting the few "rights" still to be enjoyed by the researching State. This tendency to discriminate in favour of coastal States is partly due to the fact that many of the latter — especially developing countries — continue to view the distinction between fundamental and applied research with suspicion, and partly to the inability or unwillingness

on the part of these States to distinguish between a right to conduct marine scientific research and the control and supervision of the exercise of such a right [128]).

The second conclusion which emerges is that the present provisions of the ICNT have been included to reflect the interests of the most powerful group within the Law of the Sea Conference, namely, the coastal States, and particularly the developing countries among them. It is to be expected that even in the event of a failure to reach agreement on a new Law of the Sea Convention, the provisions of the ICNT on marine scientific research would in the long run prove decisive for the evolution of customary rules in the matter [129]).

The third conclusion pertains to the short- and long-range effects of a legal régime which would make a major part of the marine scientific research undertaken by individuals, foreign States, and "competent" international organisations dependent on coastal State consent and which, as was explained earlier [130]), may even be intended to limit the conduct of such research to States and international organisations. But even if this intention is absent from the ICNT, such a research monopoly may be inevitable in fact. Under the régime contemplated by the ICNT, the path of individual scientists or private organisations intending to undertake *bona fide* fundamental marine research will be beset with such obstacles and uncertainties that the individuals or organisations concerned will prefer to turn to other areas of research [131]). That such an evolution will be prejudicial to both the short- and long-range interests of mankind requires no demonstration. But it is even doubtful whether a régime of coastal State consent for fundamental research would be in the interest of the coastal States themselves [132]), for it is precisely the developing States with extended coastlines and extensive coastal waters which would appear to have a special interest in encouraging *bona fide* fundamental marine scientific research undertaken by foreign scientists, for they are unable to conduct such research themselves; thus, they seem to have no valid reason for discouraging fundamental research by burdening foreign scientists with the vicissitudes of a consent procedure and with

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128) This issue has been addressed *supra*, p. 852.

129) Winner, *op.cit.* (*supra* note 1), p. 328.

130) See *supra*, pp. 891 ff.

131) Winner, *op.cit.* (*supra* note 1), pp. 328–329, is less pessimistic.

132) P. S. Rao, The Public Order of Ocean Resources (Cambridge, Mass. 1975), pp. 146–147.

requirements which it will often be impossible to satisfy. It must be recalled [133]), furthermore, that one day the developing coastal States too will attain the status of developed States and that, having reached this stage, they will claim freedom of marine scientific research in the economic zones and on the continental margins of other countries.

The fourth and final conclusion is that the international community will be slow in realising precisely where the true common interests of individuals, of researching and coastal States, and of mankind in general lie. It would therefore be wise not to prejudge the issue too much until that time comes and thus to retain at least some measure of freedom of marine scientific research. This could be accomplished by preserving the freedom of *bona fide* fundamental research or at least by instituting a system of automatic coastal State consent for this type of research. If either solution proves impossible — and there is some evidence to suggest that it will — one can only hope that the rules which are being elaborated by the Third United Nations Conference on the Law of the Sea will not be the last word in the matter, for, as things stand now, they are far from reflecting the interests of the human community as a whole. This view appears to be shared by Mr. A. Pardo, the initiator of the United Nations' attempt to adapt the Law of the Sea to present-day conditions. In a statement made before the United Nations Seabed Committee on 23 March 1971, the Ambassador of Malta asserted that marine scientific research

> "is the *conditio sine qua non* for the development of the oceans for the benefit of mankind. It must consequently enjoy maximum freedom" [134]).

It was the main purpose of this paper to demonstrate that these words are as valid today as they were in 1973.

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[133]) See *supra*, p. 898.

[134]) Doc. A/AC. 138/SR. 57, p. 168.