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An Overview of International Environmental Regulation

Samuel A. Bleicher*

Pollution is a global phenomenon, its effects showing no respect for political boundaries. The environment is at once both the most challenging and the most international issue facing the world community today. The first and most important question is how the international community can best organize itself for environmental action.

This Article proposes a classification of areas in which international environmental regulation is inevitable: activities physically affecting other states, activities affecting shared resources, and international regulation of national environmental standards. The author discusses the current law within these categories and urges that governments abandon their narrow, piecemeal approaches to the problem in favor of consolidating these areas of environmental regulation into an integrated framework.

The United Nations Conference on the Human Environment, held during June in Stockholm, Sweden, represented the first serious attempt to cope with the environmental crisis on a global scale and stands to be the most important environmental event of 1972. This Article suggests a framework that might form the basis for future action.

I

THE TIME OF MUDDLE

Although "the human environment" has been formally on the global agenda since 1968, when Sweden placed the matter before the
United Nations, the character of the overall problem is still only imperfectly understood. One sign of the lack of conceptual framework for consideration of international environmental problems is the piecemeal and overlapping, if not contradictory, classifications used in various analyses of environmental problems. Some analyses focus on particular pollutants, such as radioactive materials, oil, or other toxic substances; others focus on the medium of transmission, such as rivers, oceans, or airspace; others focus on the source of the pollutant. In large part, this anecdotal treatment reflects the piecemeal approach presently being taken by governments, which is in turn partly a result of a pattern of dealing with environmental problems as an adjunct to other concerns or on a post-crisis basis.


10. E.g., the Convention on the High Seas, done Apr. 29, 1958, [1962] 2 U.S.T. 2312, T.I.A.S. No. 5200, 450 U.N.T.S. 82, contains provisions on oil pollution “from ships or pipelines or resulting from the exploitation and exploration of the seabed and its subsoil,” id. art. 24, and on pollution from dumping radioactive waste or “resulting from any activities with radioactive materials or other harmful agents.” Id. art. 25. The Convention on the Continental Shelf, done Apr. 29, 1958, [1964] 1 U.S.T. 471, T.I.A.S. No. 5578, 499 U.N.T.S. 311, imposes limitations on the exploration of the Continental Shelf and the exploitation of its natural resources to prevent “unjustifiable interference” with navigation, fishing and conservation, and oceanographic research. Id. art. 5. Similarly, the Antarctic Treaty, signed Dec. 1, 1959, [1961] 1 U.S.T. 794, T.I.A.S. No. 4780, 402 U.N.T.S. 71 (effective June 23, 1961), whose primary purpose is to demilitarize and to suspend territorial claims to Antarctica, prohibits nuclear explosions and disposal of radioactive waste there [id. art. V] and provides for subsequent meetings of the contracting parties to take measures for “(f) preservation and conservation of living resources in Antarctica.” Id. art. IX. The parties have met and adopted measures to protect the Antarctic environment. See Measures in
The United Nations Secretariat and the Preparatory Committee for the 1972 United Nations Conference on the Human Environment have reorganized the conceptual structure of the Conference three times in their efforts to encompass the problem, beginning with a three-fold categorization:

(1) problems of human settlements, (2) territorial problems, and (3) global problems.13

The first Report of the Preparatory Committee altered these topics to:

(1) environmental aspects of human settlements, (2) rational management of natural resources, and (3) environmental degradation from pollution and nuisances largely abandoning the geographic approach for a resource approach.14

The Report of the Secretary-General for the Second Session of the Preparatory Committee suggested a further and apparently final alteration—the addition of "economic, financial and social aspects," "educational aspects of environmental issues," and "international institutional implications of action proposals."15 This categorization, while useful, covers the whole range of environmental issues, regardless of their international character or amenability to international regulation.


12. The Preparatory Committee was established by General Assembly Resolution on Dec. 15, 1969. It is composed of twenty-seven members and charged with the task of advising the Secretary-General, who by the resolution was entrusted with the "over-all responsibility for organizing and preparing for the Conference" and requested "to set up immediately a small conference secretariat . . . and to appoint, at the appropriate time, a Secretary-General of the Conference." G.A. Res. 2581, 24 U.N. GAOR Supp. 30, at 45, U.N. Doc. A/7630 (1969). Mr. Maurice Strong of Canada has been chosen for that position.


15. Report of the Secretary-General to the Second Session of the Preparatory Committee for the United Nations Conference on the Human Environment, U.N. Doc. A/Conf.48/PC/8 (1970). While the last two of these new categories may be considered elements of a solution rather than part of the problem, the "economic, financial, and social aspects" constitute a fundamental element of the problem, as will be seen from the discussion in Part IV, infra.
The underlying assumption of this paper is that it is essential that a few fundamental organizing concepts be found which can provide a framework for international consideration of these problems.\textsuperscript{16} An appropriate framework that can be communicated to scientists and technicians, lawyers, businessmen, government officials, and the public at large will make it possible to move simultaneously against a multitude of problems without starting from scratch to educate the relevant decision-makers about each one. In addition, a broad framework will help to create the necessary impetus for wide-ranging agreements among states. The leaderships of various states differ substantially in the amount and kinds of pressures they feel, and international action to limit environmental abuse will accordingly be differentially acceptable. While a variety of devices—from economic or political coercion to economic incentives—can be used to bring recalcitrant states into line with the policies of those who want more substantial action,\textsuperscript{17} one of the inputs into this bargaining process is the extent to which principles of international law justify international action on these various concerns. This paper is devoted to examining some comprehensive legal principles which can justify far-reaching and effec-

\textsuperscript{16} A recent illustration of the defects of the piecemeal "grocery list" approach is the limitation of the 1969 Brussels Conventions on Intervention on the High Seas in Cases of Oil Pollution Casualties and on Civil Liability for Oil Pollution Damage [see note 11 supra] to oil pollution from vessels, despite the obvious dangers from (a) other types of potential pollutants similarly transported and (b) other sources of oil pollution. To its credit, the United States opposed limiting these Conventions to oil:

The United States Government does not believe that the prototype convention limited to damage from oil pollution is worth pursuing. Pollution damage from any cargo, or some broad list of cargo, is necessary to meet unknown potential problems; we do not want to be one convention behind the next major pollution disaster.


The States represented at the Conference

\textit{FURTHER RECOMMEND} that Contracting States which become involved in a case of pollution danger by agents other than oil co-operate in applying wholly or partially the provisions of the Convention.

\textsuperscript{9} Int'l Legal Mats. 20 (1970).

\textsuperscript{17} See B. RUSSETT & J. SULLIVAN, \textit{COLLECTIVE GOODS AND INTERNATIONAL ORGANIZATION} 102-04 (U. Mo.-St. Louis Center for International Studies, Monograph No. 3, E. Fedder ed. 1971) on the likely effectiveness of monetary incentives and their under-utilization in current international relations.
tive international regulation of environmentally damaging activities and disruptive national regulatory efforts. 18

The first step in this process is to clarify in general terms the distinctive characteristics of environmental regulation as a separate field of inquiry. 19 There are several features that distinguish environmental problems from other kinds of regulation. First, environmental regulation is concerned with activities that are viewed as socially useful and desirable in their basic nature. Typically the primary intention of the operators of the regulated activity is to transform natural resources into goods and services which make possible a more comfortable, secure, and dignified mode of existence for human beings. The environmental damage is a by-product, sometimes an inherent by-prod-

18. It is appropriate at this point to note some of the matters which will not be dealt with in this Article. No attempt is made to discuss the scope of national authority to regulate environmental matters unilaterally; see e.g., Bilder, The Canadian Arctic Waters Pollution Prevention Act: New Stresses on the Law of the Sea, 69 Mich. L. Rev. 1 (1970); Henkin, Arctic Anti-Pollution: Does Canada Make—or Break—International Law?, 65 Am. J. Int'l L. 131 (1971); N.Y. Times, Feb. 28, 1970, at 56, col. 6. No attention is given to jurisdiction over transnational private litigation in environmental matters, a question of great uncertainty under some circumstances [see Read, The Trail Smelter Dispute, 1 Can. Y.B. Int'l L. 213, 222 (1963)], although such jurisdiction is potentially available under the Clean Air Amendments of 1970, 42 U.S.C. § 1857h (1970), the Michigan Environmental Protection Act of 1970, Mich. Comp. Laws Ann. §§ 691.1201-07 (1970), and the pending Federal Environmental Protection Act, S.1032, 92d Cong., 1st Sess., all of which permit suits to be brought by "any person" to enforce Federal pollution control standards and to protect the environment respectively. Finally, no consideration is given here to the appropriate international organizational structure to deal with this field; see Kennan, To Prevent a World Wasteland: A Proposal, 48 Foreign Aff. 401 (1970), Gardner, For Global Initiative, Saturday Rev., July 4, 1970, at 41.

19. The definition of "environmental law" as a separate field of inquiry is still in the formative stages. N. Landau & P. Rheingold, The Environmental Law Handbook 10-13 (1971) relies on a list including pollution, conservation, population, and land-use control and points to occupational hazards as "a special area that we give only indirect attention to in this book." Id. at 11. It later states:

Almost all of the pollution suits we consider in this book are simply actions at common law based upon the legal theories developed over the years. It is this source that will continue to give direction and shape to the citizen's private environmental suit for many years to come.

Id. at 27. No explanation of what makes certain common law cases "environmental" is given.

The three published casebooks in the field offer relatively little comment on the differences between environmental law and other fields of law. L. Jaffe & L. Tribe, Environmental Protection (1971) makes no effort to define environmental law, opening instead with an item entitled "How To Think About the Environment," which discusses in journalistic fashion current environmental problems. O. Gray, Cases and Materials on Environmental Law (1970) begins with cases and current statutes defining environmental policy. Only F. Grad, Environmental Law §§ 1.02-1.04 (1971) takes the time to discuss the function of law in dealing with environmental problems, noting the distinction between public and private interests in such litigation.
uct, of activities that society would prefer to continue either in the same or some modified form so as to retain the resulting benefits. In this respect environmental regulation differs from traditional criminal law contexts where there is typically no redeeming social utility to the activities being regulated.

Second, environmental regulation, having its conceptual roots in ecological notions about the systemic physical interdependence of all human and non-human beings and activities, is concerned with injuries that are not normally given economic value in society as well as those injuries that affect values which do carry "price tags." This absence of traditional "value" may result from the fact that the resource in question has not been reduced to possession by anyone, as in the case of air, water, and wildlife, or from the fact that the resource plays an intermediate role (from the human perspective) in ecosystem processes and is of no direct material benefit to any human beings, as in the case of aquatic micro-organisms and predatory birds. Because no specific individual or group of individuals can demonstrate economic loss in the sense recognized by the law governing personal injury and property damage, environmental regulation reaches beyond tort and property law concepts, although vigorous assertion of certain traditional doctrines like nuisance can help to protect some environmental interests.

Third, environmental regulation deals most often with activities which have a continuing deleterious impact, as in the case of pollution or urban overcrowding, or a continuing risk of unacceptably great injury, as in the case of various ultrahazardous activities. Its goal is to prevent or modify activities which may eventually result in legally compensable injuries or break down important ecosystem links. In this sense, too, environmental regulation differs from ordinary tort doctrine, which focuses primarily upon relief for injuries already sustained or imminent.

Finally, environmental regulation is unlike the related fields of consumer protection and workmen's compensation and safety law in that it is primarily concerned with injuries in which the victims are not contractually related to the activities responsible. In the typical situation the victim suffers because of physical proximity, as in the case of urban planning and ultrahazardous activities, or the flow of physical substances through the ecosystem, as in the case of pollution. Of course "environmental regulation," like other fields of law, is not a sealed compartment separated by impermeable walls from other subject matter areas. In fact not all of the cases and treaties discussed in this

paper satisfy all of these criteria. Their function is to provide some guideposts to the nature of environmental concerns.

The second step in the process of providing some organizing concepts for international environmental regulation is to recognize that the amenability of an environmental problem to international regulation depends fundamentally upon its acceptance as an international problem. Only if international lawyers conceive of a particular environmental question as international in character will they move to regulate it under either existing principles of general international law or new bilateral and multilateral agreements drafted for the purpose. From the perspective of the international lawyer the fundamental criterion for legitimate international concern about or regulation of any activity is the locus of the adverse effects of such activity, whether or not there is physical movement across an international boundary:

Actions occurring within the territorial bounds of one state with palpable deprivatory effects upon others have always been subject to claim and decision on the international plane. . . . [W]here transnational effects have been precipitated, the principle [of domestic jurisdiction] has rarely barred effective accommodations in accord with inclusive interest.21


Hence domestic jurisdiction means little more than a general community concession of primary, but not exclusive, competence over matters arising and intimately concerned with aspects of the international public order of states. Id.; see also, id. at 12. There is a substantial degree of apparent disagreement on the legitimate scope of international concern in the views of commentators. For example, Briefly expresses the opinion that

[i]n the conduct of a state does not fall under international law merely because it may affect the interests of other states; this may be true and yet the matter in question may fall within what is called the “domestic jurisdiction” of a single state.

J. BRIERLY, LAW OF NATIONS 74 (4th ed. 1949). Sir Humphrey Waldock asserts that [o]f many anti-social acts which affect the perfectly reasonable interests of another state, international law, if appealed to, could only say that they are matters exclusively within the domestic jurisdiction of the state whose conduct is in question, and therefore that no legal right of the injured state has been violated.

J. BRIERLY, THE LAW OF NATIONS 369 (6th ed. H. Waldock 1963). These views, while they may correctly describe the state of the law at any given moment in time, fail to take into account the dynamic character of law and the ability of states whose interests are adversely affected to change the law:

The question whether a certain matter is or is not solely within the jurisdiction of a State is an essentially relative question; it depends upon the development of international relations.

Advisory Opinion on Nationality Decrees Issued in Tunis and Morocco, [1923] P.C.I.J., ser. B, No. 4, 24 (emphasis added). This writer finds the formulation of Professor Hyde most persuasive:

If a State is unhampered in its activities that affect the interests of any other, it is due to the circumstance that the practice of nations has not established that the welfare of the international society is adversely affected
This principle results in the paradox that while optimal environmental regulation must be indifferent to political boundaries that traverse ecological units, international jurisdiction depends upon the existence of cross-boundary impact. Since this paper deals primarily with the appropriate grounds and scope of legitimate international regulation, it will proceed on the basis of the conventional legal concepts establishing international authority.

A classification of environmental problems in terms of their amenability to international regulation should therefore be built around the nature and locus of the impact of the activity. With this in mind, the following basic categories will be employed, progressing from that which offers the greatest likelihood of international regulation to that which offers the least:

thereby. Hence that society has not been incited or aroused to endeavor to impose restraints; and by its law none are imposed. . . .

The development of international relations causes changing estimates of the effect of the conduct of the individual State upon the life of the international community. These may serve to attach a sinister significance to acts which in a previous decade or century were looked upon with unconcern, or, on the other hand, they manifest approval of conduct once regarded as subversive of justice. . . . Inasmuch as changing estimates are to be anticipated, and as the evolution of thought in this regard appears to be constant and is perhaps now more obvious than at any time since the United States came into being, the circumstance that at any given period the solution of a particular question is by international law deemed to be solely within the control or jurisdiction of one State, gives frail assurance that it will always be so regarded.


22. This distinction between the basis for international regulation and the goals and content of international regulation is often neglected when international norms are being framed. The proper regulatory goal is not the fair adjustment of rights and duties as between individuals or states on opposite sides of a political or administrative line, but regulation that promotes optimum resource use as if the line did not exist. If such rules do an injustice in particular cases and provide windfall benefits to others, the solution is compensation to the injured party, not approval of a continued misuse of the resource in question. Unfortunately, lawyers are so deeply imbued with the concepts of adversary decision-making and jurisdictional prerogatives that this kind of ecosystem approach rarely penetrates legal thinking. For some exceptions, see the Helsinki Rules on the Uses of the Waters of International Rivers, discussed at notes 40 & 42 and accompanying text infra, and the Geneva Convention on Fishing and Conservation of the Living Resources of the High Seas, discussed at notes 215-17 and accompanying text infra. More typical is the pollution control provision of the 1909 United States-Canada Boundary Waters Treaty, discussed at notes 102-108 and accompanying text infra.

23. It should be stressed at this point that theoretical justification is only one of the factors that determines the likelihood or extent of international regulation. The scope of the impact of the unregulated activity, the degree of regulation required to ameliorate the impact, and the articulateness and influence of those whose
(1) activities physically affecting other states through the medium of shared resources,
(2) activities affecting shared resources, and
(3) national environmental regulatory activities affecting global wealth production and distribution.

The discussion that follows will elaborate upon these categories and the problems to which they relate.

II

ACTIVITIES PHYSICALLY AFFECTING OTHER STATES

The most appropriate context for international regulation of activities that degrade the environment is that which conforms most closely to the more traditional types of international claims: physical injury to people or property in one state resulting from activities taking place in or controlled by another state. This type of injury immediately arouses state response because it inflicts losses directly upon human beings or those property interests, private or governmental, which are traditionally included in economic calculations of wealth. Many environmental problems fall into this category, and most of the international activity dealing with environmental problems has been devoted to this kind of concern. Probably the most prominent example of this kind of injury has been the destruction wrought by oil washing up on beaches, coating boats, creating fire hazards, and driving away tourists. Private law remedies such as trespass and nuisance are normally available for these injuries, but the hazards of transnational private litigation and the typical large numbers of small claims have led states to establish special remedial schemes to compensate for these injuries.

In examining and evaluating the general principles of international law applicable in this context, several questions should be considered:

(1) Are states responsible for transnational injuries resulting from activities taking place within their territories?

(2) To what extent does this state responsibility carry over to (a) governmental activities carried on with due care where the risk of injury is uncertain, or (b) private activities which the government does or could regulate?

interests will be advanced by international regulation are factors which will determine the scope of regulation.

(3) If the injury is to private interests in the victim state, is there an obligation to exhaust local remedies before presenting an international claim?

These last two questions are of particular importance because in many cases the sources of environmental degradation are private activities and the victims are individuals and private property across the border.

A. Views of the Commentators

Unfortunately, the primary focus of the law of state responsibility has been on the questions of fair judicial process and expropriated industry. The controversial character of the latter topic has placed the whole subject matter under a cloud. The problem of transnational injuries has been largely neglected, except in the context

25. The status of this law is somewhat uncertain as a result of the opposition of new states and the Communist states to the customary law in this field. See the materials collected in W. Friedmann, O. Lisitzyn, & R. Pugh, Cases and Materials on International Law 747-66 (1969). The efforts of the International Law Commission to codify the principles of international law relating to state responsibility have been unsuccessful over a period of twenty years, and have now been turned in the direction of a study of the rules of imputation and appropriate forms of relief, sidestepping the questions of the scope of substantive responsibility. See [1969] 1 Y.B. Int’l L. Comm’n 104-17, U.N. Doc. A/CN.4/Ser. A (1969) for a review of the Commission’s efforts and plans on this subject.

26. One might conclude that the term “state responsibility” does not apply to transnational impacts of national activities. For example, Sohn and Baxter state: “It is the purpose of the law of state responsibility to extend the protection of international law to those who travel or live abroad and to facilitate social and economic ties between States.” Sohn & Baxter, Responsibility of States for Injuries to the Economic Interests of Aliens, 55 Am. J. Int’l L. 545 (1961). Much broader statements have been made:

§ 155. International delinquencies—a term applying both to wrongs consisting of breaches of treaties and to wrongs independent of treaty—may be committed in regard to different objects. Thus a State may be injured—in regard to its independence through unjustified intervention; in regard to its treaty rights through an act violating a treaty; or in regard to its right of protection over citizens abroad through any act that violates the person or property of one of its citizens abroad.

§ 155a. An international delinquency which during recent years has received a considerable amount of attention is the non-payment by a State of money due under contract to other States, or to the nationals of other States upon the demand of their State. . . .

§ 155aa. The responsibility of a State may become involved as the result of an abuse of a right enjoyed by virtue of International Law. This occurs when a State avails itself of its right in an arbitrary manner in such a way as to inflict upon another State an injury which cannot be justified by a legitimate consideration of its own advantage. . . . The duty of a State not to interfere with the flow of a river to the detriment of other riparian States has its source in the same principle. The maxim, sic utere tuo ut alienum non laedas, is applicable to relations of States no less than to those of individuals. . . .

of transnational guerrilla activities, where the controlling doctrines of state responsibility go under the names of neutrality and non-intervention. Nevertheless, the publicists seem to be agreed that where a state takes action in its territory which causes direct and obvious deprivation across an international border, it is in breach of its international obligations regardless of the absence of any treaty. The clearest example of such responsibility is that involving the diversion of the waters of international rivers, although even here the claim of international duty has met with occasional opposition from states so situated as to benefit from the absence of obligation. While the principle *sic utere tuo ut alienum non laedas* may not provide adequate criteria for the decision of specific cases, it seems to summarize the generally accepted view that there is an international principle limiting the range of na-

“Rights and Duties of States” are dealt with in 5 M. WHITEMAN, DIGEST OF INTERNATIONAL LAW 1 (1965), while “State Responsibility for Injuries to Aliens: Diplomatic Protection and International Claims” is covered in a separate chapter in 8 *id.* at 697. It seems clear that a proper conception of state responsibility includes duties other than those relating to the treatment of aliens, and that the narrower expressions are an oversight resulting from the traditionally marginal practical importance of these other principles by comparison to the controversy generated by conflicting claims about the economic rights of aliens.


28. See the excellent analysis by Lipper, who concludes:
Although not without dissent, the decisive weight of authority clearly endorses the limited sovereignty principle which embraces equitable utilization or, as it is sometimes termed, equitable apportionment, with respect to both contiguous and successive international rivers. Thus, each state riparian to a river which borders upon or traverses two or more states, has an equality of right with every other riparian state to utilize the waters of the river in a reasonable and beneficial manner.


29. The outstanding example is the famous Harmon Doctrine, by which the United States declared that there was no international legal requirement that the United States share the waters of the Rio Grande River with Mexico. 21 Or. ATT'Y GEN. 278 (1895). India has asserted a similar position more recently in its dispute with Pakistan over the Indus river. See Baxter, The Indus Basin, in THE LAW OF INTERNATIONAL DRAINAGE BASINS, *supra* note 28, at 443, 453. The inequitable and unacceptable character of this rule is perhaps best illustrated by the fact that less than a year before its enunciation by Attorney General Harmon, the United States had requested that the British government take “suitable measures to avert the threatened injury” which would result from a dam in Canada which would flood land in Idaho.

30. Use your own property in such a manner as not to injure that of another. Various comments have been made on this maxim: “Mere verbiage”; El. B. & E. 643. “No help to decision”; L.R. 2 Q.B. 247. “Utterly useless as a legal maxim”; 9 N.Y. 445. It is a mere begging of the question; it assumes the very point in controversy. 13 Lea 507. See 2 Aust. Jurisp. 795, 829.

tional action\textsuperscript{31} to the end of promoting optimum utilization of this natural resource.\textsuperscript{32}

The clarity of the state’s obligation is muddied by the complications of motive and imputation as one moves away from intentional or necessarily resulting damage to activity conducted with due care where the danger of injury is uncertain, and as one moves from state action to private action. For example, it may not be appropriate to require a plaintiff state to show lack of due care in situations where injuries result from certain kinds of governmental activities, such as ultrahazardous activities, as opposed to routine proprietary activities. In addition, whatever the level or levels of liability imposed upon a state for its own actions, a different standard might be appropriate as one moves along the public-private continuum to a point where the primary control of the activity is in private hands and the governmental role is only one of actual or potential supervision. Thus a state might be held responsible according to a sliding scale or scales calibrated to the character of the activity and the degree of governmental involvement in its management. In discussing the problem of state responsibility for injuries to another state resulting from the operation of a public\textsuperscript{33} nuclear facility, Hardy begins by recognizing that

the prevailing opinion is probably that international law is prohibited from exacting a standard of strict liability where delictual harm has been caused by one State to another.\textsuperscript{34} He concludes, nevertheless, that “as regards unmistakable ‘State acts’

\begin{footnotesize}
\begin{enumerate}
\item Lester, supra note 6, at 830-33, and sources cited therein. Lester considers three theoretical approaches which might offer “more elaborate criteria . . . which may assist analysis”: neighborship, abuse of rights, and international servitudes. \textit{Id}. at 833. He concludes:

This brief survey of the theoretical background to the problem reveals little of positive value. The principle \textit{sic utere tuo} is asserted and explained in various ways, but essentially it amounts to a plea for reasonable use of natural resources. \textit{Id}. at 835. He goes on to discuss “the dangers of relying only upon such a vague standard.” \textit{Id}.

\item Lipper, supra note 28, at 41-62.

\item Hardy avoids the public-private element of the problem by asserting that in the case of a nuclear accident it may be anticipated that the problem of State imputability would be avoided in its extreme forms, relating to unofficial or private acts, since in no circumstances will it be possible to imagine the operation of a nuclear power reactor without a very considerable degree of State control or direct ownership. Hardy, \textit{supra} note 3, at 749. This reliance may be misplaced considering the proliferation of privately owned reactors currently taking place in the United States. While private reactor operators are still under government regulation, they are not much more stringently controlled than, \textit{e.g.}, drug manufacturers.

\item \textit{Id}. at 752, citing 1 L. \textsc{Oppenheim}, \textit{supra} note 26, at 343: “An act of a State injurious to another State is nevertheless not an international delinquency if committed neither willfully and maliciously nor with culpable negligence.”
\end{enumerate}
\end{footnotesize}
... the requirement of 'fault' is of doubtful application ...," on the basis of The Wanderer,\textsuperscript{35} where the United States was held responsible when its naval officers mistakenly arrested a British sealing ship, and on the basis of the fact that neither negligence nor intent need be shown in case of a breach of treaty.\textsuperscript{36}

Where the harmful activity is privately conducted, as is often the case with environmentally damaging activities like pollution, additional problems arise.\textsuperscript{37} The general rule is that the state is liable to aliens only when it has itself acted (through its agents). Harmful conduct by private individuals does not result in state responsibility,\textsuperscript{38} although there may be a remedy through private litigation.\textsuperscript{39} Nevertheless, the 1966 Helsinki Rules on the Uses of the Waters of International Rivers drafted by the International Law Association establish direct state responsibility to prevent any new pollution and to take reasonable steps to abate existing pollution "consistent with the principle of equitable utilization of the waters,"\textsuperscript{40} without reference to the problem of private activities in either text or commentary. The basis for distinguishing privately-caused pollution (and potentially other types of environmental degradation as well) from other kinds of injurious private acts apparently resides in two factors: (1) the "natural resource" character of international waters, and (2) the typically continuing and predictable nature of the private activity, which thus lends itself to governmental regulation. If this is the rationale, then

\begin{enumerate}
\item \textsuperscript{35} 20 F. 140 (C.C.E.D. La. 1884).
\item \textsuperscript{36} Hardy, \textit{supra} note 3, at 757.
\item \textsuperscript{37} See 8 M. WHITEMAN, \textit{supra} note 26, at 807-19.
\item \textsuperscript{38} See Sohn \& Baxter, \textit{supra} note 26, at 576. Sohn \& Baxter included their Draft Convention on the International Responsibility of States for Injuries to Aliens, \textit{[id.] at 548}; this note refers to arts. 15-18 of the Draft Convention.
\item \textsuperscript{39} In asserting his claim through private litigation, the injured party may suffer a denial of justice, which would give rise to a distinct international claim unrelated to the nature or the source of the damage. See \textit{id.} at 550, arts. 6-8.
\item \textsuperscript{40} \textbf{ARTICLE X}
\begin{enumerate}
\item Consistent with the principle of equitable utilization of the waters of an international drainage basin, a State
\begin{enumerate}
\item must prevent any new form of water pollution or any increase in the degree of existing water pollution in an international drainage basin which would cause substantial injury in the territory of a co-basin State, and
\item should take all reasonable measures to abate existing water pollution in an international drainage basin to such an extent that no substantial damage is caused in the territory of a co-basin State.
\end{enumerate}
\item The rule stated in paragraph 1 of this Article applies to water pollution originating
\begin{enumerate}
\item within a territory of the State, or
\item outside the territory of the State, if it is caused by the State's conduct.
\end{enumerate}
\end{enumerate}
\end{enumerate}

unpredictable, "one-shot" private pollution would not give rise to state responsibility. Indeed, one writer has suggested that states are obligated to regulate private activities which might pollute international waters only to the same degree that they regulate activities threatening domestic injury. Such a principle of liability might produce results quite different from the standard of the Helsinki Rules, and it would no doubt lead to demands that it be complemented by an international minimum standard, by analogy to the traditional Western view of other areas of state responsibility.

One way to cut the Gordian knot of levels and layers of state responsibility is to treat all activities, whether public or private, which result in transnational environmental degradation beyond acceptable levels, as intentional violations of the territory of the victim state, even if the harm has been minimized. From the perspective of promoting ecologically sensitive national policies, such an approach has much to recommend it. From an economic standpoint, it can be justified as payment for consumption or destruction of a natural resource which was the "property" of the victim state. Such an approach also has the virtues of clarity and simplicity, though it may appear Draconian in character. It has been tested in domestic decisions in the United States.

With regard to the question of exhaustion of local remedies, it has been asserted that this principle does not apply to pollution of international rivers, on the ground that "damage to territory" occasions "direct pecuniary loss" to the claimant state. Where the injury is to private interests, the traditional course of action would be for the injured

43. From the evidence adduced and for the reasons to be pointed out, this Court is satisfied that Reynolds' conduct in operating its plant when it well knew fluorides were escaping therefrom and settling upon Fairview's lands in quantities then deemed to render forage thereof unsafe for dairy cow consumption, and in turn causing damage to the said forage for which it paid compensation, constituted an intentional tort on Reynolds' part.

Fairview Farms, Inc. v. Reynolds Metals Co., 176 F. Supp. 178, 184 (D. Ore. 1959). The court allowed damages but denied injunctive relief on the basis, inter alia, that the measures taken by Reynolds to minimize the escape of fluorides from its plants were the best that American industry had yet developed. Id. at 190. For a discussion of the theories of this and related cases, see Juergensmeyer, Control of Air Pollution Through the Assertion of Private Rights, 1967 DUKE L. REV. 1126.
individuals to seek relief through private litigation against the individual or government causing the damage. But where the polluting action was taken by the government in full awareness of the transnational consequences, such litigation may be futile. The substantial obstacles to successful private litigation to recompense or enjoin injury occurring across national boundaries—combined with the broad public interest in protecting natural resources, whether publicly or privately owned, from abuse by foreign interests—may justify direct state responsibility without the preliminaries of exhaustion of remedies. On balance, however, the requirement that in cases of environmental damage the injured private parties pursue all available domestic remedies seems appropriate, especially where the injury was the result of private activity. So long as the international decision-maker is realistic in evaluating the availability of relief through this mechanism, the requirement will not become onerous.

45. In particular, there is serious doubt about whether British Commonwealth courts have jurisdiction over injuries to property located outside the country. Read, The Trail Smelter Dispute, 1 CAN. Y.B. INT'L L. 213, 222-23 (1963), citing British South Africa Co. v. Companhia de Mocambique [1893] A.C. 602. Some United States jurisdictions follow the same rule, see, e.g., Arvidson v. Reynolds Metals Co., 107 F. Supp. 51 (D.C. Wash. 1952). The extent of the ambiguity surrounding such transnational litigation became apparent when some Canadian citizens inquired about the scope of their rights under a treaty provision reading:

[A]ny interference with or diversion from their natural channel of such waters on either side of the boundary, resulting in any injury on the other side of the boundary, shall give rise to the same rights and entitle the injured parties to the same legal remedies as if such injury took place in the country where such diversion or interference occurs. . . .

Treaty with Great Britain Relating to Boundary Waters between the United States and Canada, Jan. 11, 1909, art. II, 36 Stat. 2448 (1910), T.S. No. 548 (effective May 5, 1910) [hereinafter referred to as Boundary Waters Treaty]. The United States Government responded:

I regret that this Government cannot undertake to answer your inquiry as to what are the rights and remedies of the citizens of Minnesota in respect to such a case as the one under consideration, for that is a question which depends to a great extent upon State law rather than Federal law, and falls outside of the jurisdiction of this Department, except in so far as the treaty requires that Canadian interests in the State of Minnesota be protected, and on this point the provisions of the treaty are regarded as sufficient in themselves to insure such treatment.

Speech by Acting Sec'y of State, Aug. 22, 1911, as cited in Griffin, A History of the Canadian-United States Boundary Waters Treaty of 1909, 37 U. DET. L.J. 76, 94 (1959). No cases have been brought in the United States under this provision of the treaty.

On the other hand, the vast extension of "long-arm jurisdiction" statutes may make it relatively easy to sue a private polluter in the jurisdiction where the injury was incurred if the polluter is doing business there, or if pollution itself comes under the language of the statute. See Duple Motor Bodies, Ltd. v. Hollingsworth, 417 F.2d 231 (9th Cir. 1969).

B. The Case Law

1. The Corfu Channel Case

The construction of theories of state responsibility for environmental injury is built upon a very narrow base of international decisions. There are only three international cases that deal with these problems, and one of them, the Corfu Channel case, does so in a unique context. Two British warships passing through the Corfu Strait in Albanian territorial waters in 1946 struck a minefield resulting in a large number of deaths and personal injuries to the British seamen, as well as substantial destruction of one vessel and serious damage to the other. Albania had not itself laid the minefield, and the facts from which its knowledge of the minefield's existence was ultimately inferred were in dispute. Albania did not warn the British vessels of the minefield. The case was referred by the United Nations Security Council to the International Court of Justice, which held for Britain on the ground, inter alia, of "every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States." From that statement grew many of the assertions that international law imposes upon states an obligation not to permit transnational environmental injury.

47. The assertion of a negative of this sort is always hazardous, but it appears to be justified in this case. The Report of the Secretary-General on Legal Problems Relating to the Utilization and Use of International Rivers, U.N. Doc. A/5409 (1963), lists only seven decisions on this subject, including The Trail Smelter Arbitration, 3 U.N.R.I.A.A. 1905 (1949) [opinion reprinted in 35 AM. J. INT'L L. 684 (1941)], which dealt with air pollution, and Diversion of Water from the Meuse, [1937] P.C.I.J., ser. A/B, No. 70, which was limited in scope to an interpretation of the convention between the parties. The other decisions all related primarily to the settlement of international border disputes and are of little relevance here. Griffin, The Use of Waters of International Drainage Basins Under Customary International Law, 53 AM. J. INT'L L. 50, 61 (1959), refers briefly to the Zarumilla River Arbitration between Ecuador and Peru in 1945. This decision does not appear in the United Nations Report, and the writer cannot locate any reference to it in any published collection of arbitral decisions. While the Secretary-General's Survey of International Law In Relation to the Work of Codification of the International Law Commission, at 35, U.N. Doc. A/CN.4/Rev.1, (10 Feb. 1949) [available only as U.N. Publication Sales No. 1948.V.1(1)], asserts that "[a] substantial body of diplomatic correspondence, judicial practice and doctrine has grown around this subject ['the obligation of the State to prevent its territory from causing economic injury to neighboring territory in a manner not permitted by international law']," it cites only the Trail Smelter Arbitration. Id. Finally, A.P. Lester asserts that, "No case of river pollution has yet been submitted to adjudication before the International Court of Justice or any other international tribunal." Lester, Pollution, in THE LAW OF INTERNATIONAL DRAINAGE BASINS, supra note 28, at 89, 99.


50. See, e.g., Goldie, Liability for Damage and the Progressive Development of International Law, 14 INT'L & COMP. L.Q. 1189, 1226-33 (1965); Lester, supra note 6, at 839-40; Hardy, supra note 3, at 739, 753-54.
In the context of the case, however, the significance of the holding may be less than it appears. The court was primarily concerned with other matters, such as the problems of proof and presumptions, the scope of the right of innocent passage of warships, and the jurisdiction of the court to fix the amount of compensation under the language of the *com-\*promis. Since the parties agreed that Albania was obligated if it had knowledge of the minefield, the court devoted little attention to the theoretical justification for its conclusion, and in fact offered several simultaneously:

Such obligations are based . . . on certain general and well-recog-\*nized principles, namely: elementary considerations of humanity, even more exacting in peace than in war; the principle of the freedom of maritime communication; and every State’s obligation not to allow knowingly its territory to be used for acts contrary to the rights of other states.\footnote{51} The opinion contains no other discussion of this subject. Furthermore, while the case itself may be viewed as one of liability for environmental degradation of the oceans, it differs in some potentially material respects from the “typical” case of transnational environmental injury. The injury as well as the activities which caused it took place within Albanian territory, which seems to make the case more analogous to those involving the rights of aliens than to those of concern here. The injury was done directly to the military forces of the victim state, not to its citizens or their property, or even to the civilian property of the state, by an instrumentality that is normally used by states, a mine. The politico-military context of the case casts a somewhat different light on the problem: the injury was not a by-product of an economically useful activity, but the intended result of the symbolic and actual collision of two military machines. Accordingly, the decision may be a rather weak reed to lean upon when a question arises such as the responsibility of the state when a private corporation’s plant emits a chemical into the water which injures the private property of a citizen of another state. When both the wrongdoer and the victim are private individuals, the possibility of relief through private litigation seems sufficiently great to justify at least requiring the exhaustion of domestic remedies and arguably to eliminate state responsibility completely.

On the other hand, there are elements in the *Corfu Channel* case which enhance the claim of direct state responsibility for conventional transnational environmental damage. Although the opinion of the court deals with the basis of liability in a peremptory manner, several of the other opinions (mostly dissenting) deal with the question

\footnote{51. [1949] I.C.J. 4, 22.}
in some detail, discussing not only whether knowledge is an adequate basis for liability, but also whether ignorance resulting from insufficient efforts to keep informed is an adequate basis for liability. The opinions on this latter issue ranged widely. Judge Alvarez believed that

(2) Every State is bound to exercise proper vigilance in its territory. . . .

A State which fails to exercise this vigilance, or is negligent in its exercise, will find its responsibility involved in case of injury caused in its territory to other States or to their nationals.

(3) As a consequence of the foregoing, every State is considered as having known, or as having a duty to have known, of prejudicial acts committed in parts of its territory where local authorities are installed; that is not a presumption, nor is it a hypothesis, it is the consequence of its sovereignty. while Judge Badawi Pasha insisted that

[s]ome are of the opinion that a general obligation exists for States to exert reasonable vigilance along their coast and that the failure of Albania to act with due diligence was, in the absence of knowledge on her part, the reason that the minefield remained undiscovered and that it caused the explosion.

Such a general obligation does not exist and cannot exist.

The careful consideration of this question in the separate opinions indicates that the language in the opinion of the court could not have been chosen inadvertently and can therefore be taken to reflect the considered judgment of the majority.

Another element of the case is important to the practical significance of the court's determination that knowledge of the danger, without any other state involvement, is sufficient to engage its responsibility. The court did not conclude that Albania knew of the minefield by direct proof, for none was available. Instead

Great Britain was . . . permitted to rely on inferences and circumstances in proving Albanian knowledge and negligence which would not have been adequate to prove Albania or Yugoslavia guilty of a wrongful act or of complicity. It would appear that this distinction in regard to the types of evidence admissible had the practical effect of shifting the burden of proof.

52. Id. at 44 (separate opinion).
53. Id. at 65 (dissenting opinion). Other views are those of Judge Winiarski, id. at 52-54 (dissenting opinion); Judge Krylov, id. at 72 (dissenting opinion); Judge Azevedo, id. at 82-86 (dissenting opinion); Dr. Ecer, id. at 121, 127-28 (dissenting opinion).
The evidence found sufficient by the court related to the difficulty of laying the minefield without detection from the shore and the diplomatic statements of Albania after the explosion, which evidenced no surprise at the presence of the mines or condemnation of those who placed them in the channel. With this kind of "liberal recourse to inferences of fact and circumstantial evidence" permitted, it would seem unlikely that a state could succeed in claiming ignorance of the existence of a continuing source of pollution on its territory if it had been in operation for any length of time. If knowledge is sufficient for state responsibility, the evidence necessary to establish such an international claim would appear to be rather minimal, although of course much more data may be necessary to prove the extent of damages. Thus on balance the Corfu Channel decision may be of great utility in placing the international law of environmental degradation on a sound footing.

2. Trail Smelter Arbitration

In 1941, only a few years before the Corfu Channel case, the one case dealing directly with the problem of transnational environmental degradation was decided by an ad hoc arbitral tribunal set up by the United States and Canada. The long and involved history of the Trail Smelter Arbitration need not be dealt with here. It is sufficient to say the sulphur dioxide fumes from the plant of a private corporation located in Trail, British Columbia, were doing substantial damage to privately owned agricultural and timber land in the State of Washington. The matter was referred first to the International Joint Commission, whose report in 1931 was accepted by Canada but rejected by the United States. After some time, the dispute was submitted to an ad hoc arbitral tribunal on the basis of a special convention. The Tribunal was requested to answer inter alia the following question, "applying the law and practice followed in dealing with..."
cognate questions in the United States of America as well as International Law and Practice, . . ."\(^{60}\)

(2) In the event of the answer to the first part of the preceding question being in the affirmative, whether the Trail Smelter should be required to refrain from causing damage in the State of Washington in the future and, if so, to what extent?\(^{61}\)

Finding initially that the cognate law in the United States, "whilst more definite, is in conformity with the general rules of international law,"\(^{62}\) the Tribunal examined with some care the interstate litigation in the United States Supreme Court, and it concluded that under the principles of international law, as well as of the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties of persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.\(^{63}\)

In implementing this principle, the Tribunal imposed upon the Smelter a regime of maximum hourly permissible sulphur dioxide emissions, which varied according to the time of day, weather conditions, and season of the year. The Tribunal ordered this regime because it was "of the opinion that damage may occur in the future, unless the operation of the Smelter shall be subject to some control,"\(^{64}\) and "that the prescribed regime will probably remove the causes of the present controversy and . . . will probably result in preventing any damage of a material nature occurring in the State of Washington in the future."\(^{65}\) This statement of the rule and the result of the arbitration would seem to lend support for the proposition that a state has an absolute duty to prohibit "serious" transnational pollution, even if it is necessary to forego the benefits of the offending activity; mere compensation for damages is insufficient. The Canadian and American officials who drafted the arbitration convention apparently did not consider that duty to be a requirement of the law, however, as is indicated by the phrase, "and if so, to what extent," in Question (2) above. On the basis of their understanding of the substantive law, they authorized the Tribunal to impose either injunctive relief or indemnity for future damages if that should be necessary.\(^{66}\) In the

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60. Id. at art. IV.
61. Id. at art. III. Question (1) appears in text accompanying note 74 infra.
63. Id. at 1965, 35 AM. J. INT'L L. at 716.
64. Id. at 1966, 35 AM. J. INT'L L. at 717.
65. Id. at 1980, 35 AM. J. INT'L L. at 733.
66. Read, supra note 45, at 224-25. In fact the parties were so uncertain about
circumstances of the case, the Tribunal was not required to make the choice between halting the damage and halting the operation of the Smelter; a technological solution was found. The decision did make provision, however, for further compensation in case the controls did not prevent all subsequent injury. While such a position is consistent with a ruling that no damage should be permitted, it does preclude the conclusion that a state may not engage in activities which create a risk of transnational injury. The Tribunal clearly foresaw the possibility of future damage resulting from the regime it imposed, yet it did not attempt to abolish that risk.

Of particular interest is the private source of injury aspect of the problem: the arbitration was the result of the continuing operations of a private corporation in Canada damaging property in the United States. Unfortunately, the opinion of the Tribunal is of little help in determining the liability of the state for the actions of its citizens. After announcing its conclusion quoted above, it continued:

Considering the circumstances of the case, the Tribunal holds that the Dominion of Canada is responsible in international law for the conduct of the Trail Smelter. Apart from the undertakings in the Convention, it is, therefore, the duty of the Government of the Dominion of Canada to see to it that this conduct should be in conformity with the obligation of the Dominion under international law as herein determined.67

There is no further elaboration or citation of authority. While the result may be perfectly sensible in the context of an ad hoc arbitration based upon a convention, where the parties by their words and actions had already recognized "the desirability and necessity of effecting a permanent settlement,"68 its incompatibility with the principles of the law of state responsibility toward aliens is striking. If the property owned by United States citizens and injured by fumes from the privately-owned smelter had been located in British Columbia, there would

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the law that they were worried about the possibility of a finding non liquet. Id. at 227.


68. Smelter Convention, 49 Stat. 3245 (1935), T.S. No. 893 (effective Aug. 3, 1935). Canada had already paid $350,000 for damages caused prior to January 1, 1932, apparently on the basis of the report of the International Joint Commission. Id. art. I. John E. Read, who dealt with this matter as the Canadian Legal Advisor to the Secretary of State for External Affairs, has written that there was, during the negotiation of the Convention, a determination on both sides to bring about "a permanent settlement" of the controversy and "a solution just to all parties concerned." The words "all parties" were in contrast to the "High Contracting Parties" and included the claimants and the Trail Smelter.

Read, supra note 45, at 223.
presumably be no state responsibility. The location of the property in
the United States may justify a greater United States governmental
interest, but how does it increase the responsibility of Canada? The
negotiators of the arbitration convention were apparently aware of its
anomalous character. John E. Read, Legal Advisor to the Secretary
of State for External Affairs of Canada during the negotiation of the
convention, has commented on this aspect of the case:

The United States government intervened, through diplomatic
channels, in 1927. The subject-matter of the dispute did not di-
rectly concern the two governments; nor did it involve claims by
United States citizens against the Canadian government. It did
not seem to come within any of the ordinary categories of arbitrable
international disputes. It consisted rather of claims based on nui-
sance, alleged to have been committed by a Canadian corporation
and to have caused damage to United States citizens and property
in the State of Washington. Nevertheless, when the United States
proposed to refer the questions at issue to the International Joint
Commission, the Canadian government concurred.69

The second problem [which arose in negotiating the arbitral
convention] presented much more difficulty, and it has already
been indicated. Basically, it seemed to be a case of nuisance, com-
mitted in British Columbia by a Canadian company and causing
damage to a great many (some hundreds) persons in the State of
Washington.

The three difficulties, referred to above, were surmounted by
transmuting the claims by individuals against the Trail Smelter
into claims sounding in international tort by the United States
against Canada.70

While it is perfectly acceptable for two states to "transmute" claims
against private parties in a state into international obligations of that
state by international agreement for whatever reasons they think fit,
such a voluntary acceptance of responsibility in a single case does not
alter the scope of state responsibility under general international law.
Read's views reinforce the idea that the Tribunal overstated the scope
of state responsibility in saying that Canada was obligated "apart from
the undertakings in the Convention."71

The problem of exhaustion of local remedies, as well as obstacles
related to the national character of the claims, was similarly caused to
evaporate. Recognizing that on the basis of existing Canadian and

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69. Read, supra note 45, at 213-14.
70. Id. at 222-23.
71. See text accompanying note 67 supra.
English law, the Canadian courts would not take jurisdiction of a case involving trespass to land outside of the province, the negotiators determined to avoid the requirement of exhaustion, which they thought would be futile. Instead of a provision waiving the requirement, the parties took the more drastic step of completely removing the individual claims from the dispute. The Tribunal was asked:

(1) Whether damage caused by the Trail Smelter in the State of Washington has occurred . . . and, if so, what indemnity should be paid therefor?

At the same time, the "interested parties" were permitted under the Convention to appear before the Tribunal to present evidence and argument. Again, while states may enter into international agreements which ignore the details of individual claims, such agreements must be viewed as waivers of the provisions of general international law on exhaustion of remedies and continuity of national claims. The Tribunal obliged the parties' desire by not addressing itself at all to the question of exhaustion of local remedies or the related limitations on individual claims.

The Tribunal's insensitivity to the questions of imputing responsibility to the state for private acts and of exhaustion of local remedies is illustrated by its treatment of the precedents it found in the decisions of the United States Supreme Court regarding interstate pollution. Most of the cases were actions brought by an American state against another American state for governmental activities, typically the dumping of municipal sewage into waterways that washed the shores of the plaintiff state. Only one Supreme Court case, Georgia v. Tennessee—

72. Read, supra note 45, at 222.
73. The third difficulty—the technical rules of international law governing the presentation of claims—was overcome by avoiding the format of the ordinary claims convention. The problem presented to the tribunal for solution was not the problem of damage or injury to this, that or the other person in the State of Washington. It was the problem of damage caused in the State of Washington, regardless of who was hurt. Damage was not related to persons, and problems of national character of claims and pursuits of national remedies became irrelevant.

Id. at 225.
75. Id. art. VIII.
76. When international claims are asserted on behalf of injured individuals, it is traditionally a prerequisite that the individuals be citizens of the claimant state both at the time of the injury and at the time of the judgment in the case. See 8 M. WHITEMAN, supra note 26, at 1233-44. By transforming the Trail Smelter claims into a state-to-state question, the possibility that particular claimants might be disqualified because of some break in the continuity of their citizenship was eliminated, although the United States in distributing the proceeds of the judgment may have taken this factor into account.
77. Lester, supra note 6, at 837-38.
see Copper Co.,\textsuperscript{78} involved a private source of pollution, and there the suit was brought and the relief granted directly against the polluter, not against the State of Tennessee.\textsuperscript{79} There is not a word in the decision imputing responsibility to the State of Tennessee.\textsuperscript{80} Such imputation was not necessary because the defendant was the offending private party; accordingly, the Court did not need to concern itself with the responsibility of the State. For the same reason, exhaustion of local remedies was not a prerequisite to relief. Nevertheless, the Court was at some pains to note that the State of Georgia had taken some steps analogous to exhaustion of local remedies, though it had made no effort to seek judicial relief in Tennessee.\textsuperscript{81} The Trail Smelter Arbitral Tribunal in its opinion completely ignored the crucial differences between its case and \textit{Georgia v. Tennessee Copper Co.}:

Although dealing with a suit against private companies, the decisions were on questions cognate to those here at issue. Georgia stated that it had in vain sought relief from the State of Tennessee, on whose territory the smelters were located, and the court defined the nature of the suit by saying: "This is a suit by a State for an injury to it in its capacity of quasi-soveriegn. In that capacity, the State has an interest independent of and behind the titles of its citizens, in all the earth and air within its domain."\textsuperscript{82}

It should be noted that the quoted language deals with the standing of the State of Georgia as \textit{plaintiff}, not with the responsibility of the State of Tennessee. The Supreme Court's interest in exhaustion of local remedies\textsuperscript{83} is not reflected at all in the opinion of the Tribunal.

\textsuperscript{78} 206 U.S. 230 (1907).
\textsuperscript{79} \textit{Id.} at 237. The major concern of the majority opinion by Justice Holmes was to demonstrate that the State of Georgia had a sufficient interest as a \textit{plaintiff}. Justice Harlan, concurring in the result, insisted that Georgia's rights were no greater than those of a private party, and it was entitled to relief only on that basis. \textit{Id.} at 239-40.
\textsuperscript{80} There is some language in the opinion about the impossibility of "the forcible abatement of outside nuisances," [\textit{Id.} at 237] but that is hardly equivalent to a holding of state responsibility.
\textsuperscript{81} \textit{Id.} at 233-34, 236.
\textsuperscript{83} The Supreme Court's interest in local solution of these problems was recently emphasized by its refusal to exercise its discretionary original jurisdiction in a case very similar to \textit{Georgia v. Tennessee Copper Co.}, but involving defendants in both Michigan and Ontario, Canada:

Two principles seem primarily to have underlain conferring upon this Court original jurisdiction over cases and controversies between a State and citizens of another State or country. The first was the belief that no State should be compelled to resort to the tribunals of other States for re-
dress, since parochial factors might often lead to the appearance, if not the reality, of partiality to one's own. [Citations omitted.] The second was that a State, needing an alternative forum, of necessity had to resort to this Court
Notwithstanding these objections, the *Trail Smelter Arbitration* remains the only international judicial decision to deal directly with the problem of transnational pollution damage, and it clearly holds that as a matter of general international law (1) no state may use or permit the use of its territory so as to cause serious transnational injury, and (2) this rule imposes state responsibility even though the source of the injury is completely under private management. By clear implication, it also holds that activities which create a risk of pollution, or occasional pollution, may be carried on, although the resulting damages must be compensated. By silence, it indicates that local remedies need not be exhausted, nor the continuity of nationality of individual claims proved. Taken at face value, the decision establishes a standard of conduct in the field of transnational environmental degradation more stringent than that applied in the protection of aliens within the territory. From the point of view of the ecologist, it will have the salutary effect of giving to states asserting claims of environmental injury the support of general international law.

3. *Lake Lanoux Arbitration*

The most recent decision dealing with environmental problems is the 1957 *Lake Lanoux Arbitration*.[84] The case dealt with Spain's objection to a French plan to divert the waters of Lake Lanoux into the basin of the Ariege River to generate hydro-electric power and to

in order to obtain a tribunal competent to exercise jurisdiction over the acts of nonresidents of the aggrieved State.

Neither of these policies is, we think, implicated in this lawsuit. The courts of Ohio, under modern principles of the scope of subject matter and *in personam* jurisdiction, have a claim as compelling as any that can be made out for this Court to exercise jurisdiction to adjudicate the instant controversy, and they would decide it under the same common law of nuisance upon which our determination would have to rest. In essence, the State has charged Dow Canada and Wyandotte with the commission of acts, albeit beyond Ohio's territorial boundaries, that have produced and, it is said, continue to produce disastrous effects within Ohio's own domain. While this Court, and doubtless Canadian courts, if called upon to assess the validity of any decree rendered against either Dow Canada or Wyandotte, would be alert to ascertain whether the judgment rested upon an even-handed application of justice, it is unlikely that we would totally deny Ohio's competence to act if the allegations made here are proved true. See *e.g.*, . . . ALI, Restatement of the Foreign Relations Law of the United States 2d, § 18. And while we cannot speak for Canadian courts, we have been given no reason to believe they would be less receptive to enforcing a decree rendered by Ohio courts than one issued by this Court, Thus, we do not believe exercising our discretion to refuse to entertain this complaint would undermine any of the purposes for which Ohio was given the authority to bring it here.


restore to the Carol River, where the water would otherwise have flowed, an equivalent amount of water from a higher point on the Ariege. The Carol River flows into Spain; the Ariege River does not. In addition to restoring the water, the French government, after years of negotiation, agreed to guarantee a certain daily minimum flow in the Carol River, which would protect Spanish farmers against drought, and to permit a Spanish Consul to inspect the volumes of water to assure that Spain was not shortchanged.\(^5\) Although the rights of the parties were governed by the Additional Act accompanying the 1866 Treaty of Bayonne, its provisions did not dictate the disposition of all of the Spanish claims.\(^6\) The Tribunal fell back upon principles of customary international law for guidance.\(^8\) Among other arguments, including the contention that no French action was permissible without prior Spanish agreement,\(^8\) Spain asserted that the diversion and restitution "alters the natural conditions of the hydrographic basin of Lake Lanoux" and makes the "restitution of the waters of the Carol physically dependent upon human will." The Tribunal rejected the latter argument on the grounds that states must be presumed to act in good faith and according to their international obligations, and that there was no indication that the plans for the French project suggested any likelihood of inability to perform "either because of defects in measuring instruments, or in mechanical devices to be used in making restitution."\(^9\) Beyond that, there was no difference between this increase in the capacity of France to injure Spain and the construction of fortifications by France, which would unquestionably be lawful. On the former Spanish contention, the Tribunal asserted the functional equivalence of the waters:

The Tribunal does not overlook the reality of each river basin which, from the point of view of physical geography, constitutes, as the Spanish Memoire (p. 53) maintains, "a whole." But this observation does not authorize the absolute consequences that the Spanish thesis would like to draw from it. The unity of a basin is sanc-

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\(^5\) This was not the initial French proposal, which was far less favorable to Spain. Spanish objections led to progressively more favorable proposals from France, as well as various efforts to negotiate a solution. After Spain rejected the last proposal, France asserted that because Spain was not adversely affected by the plan, it would proceed without any agreement. Spain insisted on a plan which would produce ten percent less electricity for France and no diversion of the waters of Lake Lanoux. At that point the parties agreed to arbitrate under a 1929 general arbitration treaty. 53 Am. J. Int'l L. 156, 159 (1959).

\(^6\) The relevant treaty provisions are found in the Lake Lanoux case, 53 Am. J. Int'l L. 156, n.3 (1959).

\(^8\) Id. at 160.

\(^8\) The Tribunal rejected this contention on the basis of customary international law. Id. at 165.

\(^9\) Id. at 161.
tioned at the juridical level only to the extent that it corresponds to human realities. The water which by nature constitutes a fungible item may be the object of a restitution which does not change its qualities in regard to human needs. A diversion with restitution, such as that envisaged by the French project, does not change a state of affairs established in response to the demands of life in society.  

The Tribunal also noted briefly that Spain did not allege any change in the quality of the waters to be received:  

It could have been argued that the works would bring about a definitive pollution of the waters of the Carol or that the returned waters would have a chemical composition or a temperature or some other characteristic which could injure Spanish interests. Spain could then have claimed that her rights had been impaired in violation of the Additional Act. Neither the dossier nor the debates of this case carry any trace of such an allegation.

Spain lost on all counts, and France was permitted to build its hydroelectric project as planned. The treaty basis of the dispute and the governmental character of the proposed project spared the Tribunal the difficulties of delving into the problems of state responsibility for private action and exhaustion of local remedies, and the decision sheds no light on these questions.

Nevertheless, from the point of view of establishing some substantive principles for environmental protection, the case is of great interest as a virtual catalogue of potential grounds for relief. As would be expected, France was not entitled to unrestricted use of the waters of the Lake in its territory. Furthermore, the Tribunal did not end the

90. Id. (emphasis added). The last ten words of this paragraph were taken from the translation in U.N. Doc. A/5409 (1964), at 501, as it seemed more adequate to convey the meaning of the original French.

91. 53 AM. J. INT'L L. 156, 160-61 (1959). Lester, supra note 6, at 839, quotes the first sentence of this paragraph with the following introductory language: The Tribunal was mainly concerned to interpret the treaty, but its reasons for rejecting the claim of Spain were stated more generally in terms of international law.

Id. This suggestion that the Tribunal was announcing a principle of general international law seems an overstatement in light of the remainder of the paragraph and art. 12 of the Additional Act:

The downstream lands are subject to receiving from the higher lands of the neighboring Country the waters which flow naturally from it together with what they carry, without the hand of man having contributed thereto. There may be constructed neither a dam, nor any obstacle capable of harming the upper riparians, to whom it is likewise forbidden to do anything which might increase the burdens attached to the servitude of the lower lands.

53 AM. J. INT'L L. 156, 156 n.3 (1959).

92. Laylin & Bianchi, The Role of Adjudication in International River Disputes—The Lake Lanoux Case, 53 AM. J. INT'L L. 30 (1959), suggest that a primary significance of the case is that it illustrates the usefulness of international adjudication as a means of obtaining just solutions to international river disputes.
case by guaranteeing the return of an amount of water equivalent—or in fact greater—than the amount which it intended to divert. Rather, it was only satisfied when it was persuaded that there would be no adverse effects on Spanish interests, whether from alterations of quantity or quality. The Spanish objection to the transfer of water from one basin to another was rejected because it did not “change its qualities in regard to human needs.” Similarly, the Tribunal noted that a change in a “characteristic” of the waters “which could injure Spanish interests” would be a basis for relief. The Tribunal expressly articulated the view that actual adverse impact on human needs is the controlling factor and rejected conceptual limitations assuming either the fungibility or non-fungibility of water according to source or composition. It was not asked about the relevance of ecological damage that has no immediate apparent connection to existing or planned human uses, so its references to human needs and Spanish interests cannot fairly be taken as a conscious exclusion of legal protection of ecological interests. Finally, the Tribunal indicated a willingness, had there been a claim on this point, to peruse the details of the French project to assure that France would in fact be capable of performing in the ways promised rather than relying blindly upon assertions that it would be willing and able to do so.

4. Evaluation of the Cases

Taken together, the Corfu Channel case and the Trail Smelter and Lake Lanoux arbitrations establish a consistent if somewhat surprising set of principles governing state responsibility for transnational environmental damage. The overriding proposition is that a state may not use or permit the use of its territory in such a manner as to cause substantial damage in another state. There is no requirement of a balancing of interests or any prerequisites involving the use the plaintiff state is presently making of either the resource itself or the injured property. The restriction extends beyond state-initiated activity to private activity, which will be imputed to the defendant state if it knew of its injurious character; such knowledge can be imputed on the basis of a liberal policy of inferences from circumstantial evidence. At the same time, a state is not automatically responsible for activities which only create a risk of injury or the capability to cause injury. There is no requirement of exhaustion of local remedies, even if the injury is only to private interests, and apparently no requirement of continuity of nationality.

These principles go well beyond the traditional substantive principles of nuisance, which would allow a balancing of the benefits of the
defendant's activities against the damages suffered by the plaintiff, and the general principles of the law of state responsibility to aliens, which would reach only to state-controlled activities and would require exhaustion of local remedies and continuity of nationality of individual claims. Their absolutism may be explained by the peculiar circumstances of the Corfu Channel case, the implicit acceptance of liability by Canada in the Trail Smelter case, and the absence of liability in the Lake Lanoux case, which respectively permitted each tribunal to avoid potentially difficult questions of relative detriment and benefit. However appealing such an absolute rule may be to conservationists and ecologists, one might expect a tribunal to retreat from it when faced with the prospect of actually terminating an activity that produces significant benefits in the defendant state. It is to be hoped that the retreat will not go beyond the point that will result in optimum potential utilization of the resource involved, not on the basis of existing uses on either side of the border, but on the basis of optimum ultimate utilization as if there were no border. Similarly, the absence of any requirement of exhaustion of local remedies may be the result of the particular nature of these cases. One might expect that in an appropriate case of privately controlled activity causing transnational environmental damage, a tribunal would call for the exhaustion of existing local remedies, in the interest of orderly and effective conflict resolution through lower level institutions wherever possible.

At the same time, the doctrine is still sufficiently fluid to permit a tribunal in an appropriate case to impose the most sweeping relief should that appear to be in the interest of the complaining party or the world community. The language of the cases consistently asserts the desirability of stringent limitations upon activities which cause transnational injury. It may be hoped that this doctrine will cause states to take vigorous measures to minimize damage of this kind.

Before turning to the range of treaty provisions dealing with various aspects of this subject, it may be worthwhile to take note of an incident in which these principles were tested. On March 1, 1954, the United States exploded a hydrogen bomb on Eniwetok Atoll in the

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94. In this context, the recent Michigan statute giving "any person" standing to commence legal action against any public or private entity "for the protection of the air, water and other natural resources and the public trust therein from pollution, impairment or destruction" may serve as a model for domestic legislation which can provide a remedy for transnational environmental damage. Michigan Environmental Protection Act of 1970, Mich. Comp. Laws Ann. § 691.1202(1) (1970).
Marshall Islands in the Pacific Ocean. Despite the establishment of a 30,000 square mile danger zone around the test site, several Japanese fishermen suffered serious radiation injury and one died. Their presence within the danger area at the time of the test was never determined. In addition, over 175 tons of fish were destroyed, and the Japanese market for fish was seriously disrupted. The Japanese government presented claims to the United States for its own expenses and for the injuries suffered by its nationals, which the United States paid on January 4, 1955, with an accompanying note containing the following language:

The Government of the United States of America has made clear that it is prepared to make monetary compensation as an additional expression of its concern and regret over the injuries sustained.

... [T]he United States of America hereby tenders, ex gratia, to the Government of Japan, without reference to the question of legal liability, the sum of two million dollars for purposes of compensation for the injuries or damages sustained as a result of nuclear tests in the Marshall Islands in 1954. . . .

It is the understanding of the Government of the United States of America that the Government of Japan, in accepting the tendered sum of two million dollars, does so in full settlement of any and all claims against the United States of America or its agents, nationals, or juridical entities, on the part of Japan and its nationals and juridical entities for any and all injuries, losses, or damages arising out of the said nuclear tests.

The lawfulness of the bomb tests was the subject of heated debate in the *Yale Law Journal*, including significant differences of opinion over the absolutist character of the holding in the *Trail Smelter Arbitration*. Nevertheless, the United States paid the claim for serious injuries actually suffered outside United States territory as a result of activities conducted within its territory, allegedly ex gratia. In light of the doctrine and decisions reviewed above, the United States would certainly have been required to pay those claims by any international tribunal, even though injunctive relief would seem inappropriate because of the apparent ability of the United States to avoid injuries in future nuclear tests.


96. 32 DEP'T STATE BULL. 90-91 (1955).


98. The problem of injury to the oceans and atmosphere themselves is discussed in Part III, infra.
C. Treaties

1. Water Pollution

In certain limited contexts, the precise content of the general international law on the subject of transnational environmental damage has been rendered moot by the establishment of treaties dealing with the problem.99 This is particularly true in the field of international river problems, where a United Nations compilation shows over two hundred treaties governing non-navigational aspects of the use and utilization of international rivers.100 Many of these treaties deal specifically with pollution as well as allocation or diversion of water.101 Perhaps the best-known example of such a treaty is the United States—Canadian Boundary Waters Treaty of 1909,102 which was designed to prevent disputes regarding the use of boundary waters and to settle all questions which are now pending between the United States and the Dominion of Canada involving the rights, obligations, or interests of either in relation to the other or to the inhabitants of the other, along their common frontier, and to make provision for the adjustment and settlement of all such questions as may hereafter arise. . . .103

The treaty established an International Joint Commission which controls all obstructions or diversion of boundary waters "affecting the natural level or flow of boundary waters on the other side of the line."104 No similar enforcement power was given the Commission with respect to the provision that "boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other."105 As pollution of the


101. Lester, supra note 6, at 841-42.


103. Id.; see Griffin, supra note 45.


Great Lakes and other transnational environmental problems grew, the Commission has been requested to make non-binding studies of these problems under Article IX of the Treaty. In 1920 the Commission at the request of the parties drafted a supplemental treaty to expand its authority over pollution problems, but the treaty was never approved. New efforts to strengthen the hand of the International Joint Commission are underway, although the hope of a supplementary agreement before the end of 1971 did not materialize.

In Europe, in addition to provisions in a large number of bilateral and basin-wide agreements, regional efforts to improve water quality are underway through the machinery of several international organizations, of which the Council of Europe alone has produced tangible progress. The initial subject of concern was to terminate the use of non-biodegradable detergents which were fouling Europe's waters. As early as 1961, the German Government passed legislation on this subject to take effect in October of 1964. But it was not until September 1968 that the European Agreement on the Restriction of the Use of Certain Detergents in Washing and Cleaning Products, drafted under the auspices of the Council of Europe, was signed by several European states. The Consultative Assembly of the Council had already adopted some “Guiding Principles on Fresh Water Pollu-


108. See 64 DEP'T STATE BULL. 828 (1971).


110. See materials cited note 109 supra.

111. Europ. T.S. No. 64 (Sept. 16, 1968). The Organization for Economic Cooperation and Development also played a role in laying the groundwork for this agreement. See International Cooperation to Study the Pollution of Water by Detergents, supra note 109.
tion Control" as well as an Outline of a European Water Charter in 1965.\textsuperscript{112} This Charter was adopted\textsuperscript{113} by the Committee of Ministers in 1967\textsuperscript{114} and officially proclaimed in 1968.\textsuperscript{115} The Consultative Assembly also approved a substantial program to promote the Water Charter throughout Europe,\textsuperscript{116} looking forward to the ultimate adoption of a European treaty on the subject. In 1969, it recommended that the Committee of Ministers prepare a European convention based upon the Assembly's Draft Convention on the Protection of Fresh Water Against Pollution.\textsuperscript{117}

The Draft Convention is a far-reaching document, covering the substantive and procedural aspects of interstate disputes and providing remedies for injured individuals.\textsuperscript{118} Article 2 sets out the substantive

\begin{enumerate}[itemsep=0pt]
\item There is no life without water. It is a treasure indispensable to all human activity.
\item Fresh water resources are not inexhaustible. It is essential to conserve, control, and wherever possible, to increase them.
\item To pollute water is to harm man and other living creatures which are dependent on water.
\item The quality of water must be maintained at levels suitable for the use to be made of it and, in particular, must meet appropriate public health standards.
\item When water is returned to a common source it must not impair further uses, both public and private, to which the common source will be put.
\item The maintenance of an adequate vegetation cover, preferably forest land, is imperative for the conservation of water resources.
\item Water resources must be assessed.
\item The wise husbandry of water resources must be planned by the appropriate authorities.
\item Conservation of water calls for intensified scientific research, training of specialists and public information services.
\item Water is a common heritage, the value of which must be recognized by all. Everyone has the duty to use water carefully and economically.
\item The management of water resources should be based on their natural basins rather than on political and administrative boundaries.
\item Water knows no frontiers; as a common resource it demands international co-operation.
\end{enumerate}


\textbf{118. See Vander Elst, Le Projet de Convention Européenne Relative à la Protection}
obligation of states
to abate any existing pollution and to prevent any new form of wa-
ter pollution . . . causing or likely to cause substantial injury or dam-
age in the territory of any other contracting state.\textsuperscript{110}

This end is to be accomplished through the establishment of joint river basin commissions and water quality standards. Articles 3 through 6 provide for compulsory settlement of disputes between the states "about their rights, interests, or obligations under, or the interpretation of," the Convention. Articles 7 through 12 provide for compensation for damage to individuals from "the contracting state in whose territory any water pollution arises whether wholly or in part." This remedy is limited in situations "where standards of water quality have been adopted . . . for the international drainage basin concerned" to "such damage as shall be caused in contravention of such standards." The apparent impact of these provisions would be to encourage upstream states to enter into such arrangements and thereby to limit the scope of their liability to private individuals. By the same token, down-
stream states would find that entering into such an arrangement would


119. Article 2

1. Contracting states shall take measures to abate any existing pollution and
to prevent any new form of water pollution or any increase in the degree of
existing water pollution causing or likely to cause substantial injury or damage
in the territory of any other contracting state. Such measures shall be de-
dsigned to preserve, to the maximum extent possible, the qualities of the
waters of international drainage basins in order to safeguard public health
and to permit their use, after such economically justified treatment as may be
necessary, in particular for:

(a) the production at a reasonable cost of drinking water of good
quality;
(b) the conservation and development of aquatic resources, including
both fauna and flora;
(c) the production of water for industrial purposes;
(d) irrigation;
(e) use by domestic animals and wildlife;
(f) recreational amenities, with due regard to health and aesthetic re-
quirements.

2. Contracting states shall for the purpose of effectively implementing the
provisions of paragraph 1 of this article:

(a) wherever possible, agree to establish and maintain standards of
quality for the waters of an international drainage basin extending
over their territories;
(b) where appropriate in the circumstances, establish joint commissions
to regulate usage of such waters;
(c) inform the other contracting states about standards in force under
paragraph (a);
(d) from time to time inform and consult with other contracting
states concerned, about the usages of such waters;
(e) adopt legislative and administrative measures to implement the
Convention within their respective territories.

Council of Europe Consultative Assembly, Recommendation 555, \textit{supra} note 117.
terminate the rights of their citizens to seek individual relief for pollution to the extent that it was permissible under the agreement.

The debate in the Consultative Assembly on the Draft Convention indicated quite clearly that the upstream European states were reluctant to enter into a convention placing this kind of liability upon them. Representatives from Germany, France, and Switzerland objected to the provisions on individual compensation in the Draft Convention. A Swiss representative, in particular, suggested that bilateral agreements rather than a single multilateral agreement might yield more progress. It remains to be seen whether anything resembling the Draft Convention will be adopted. Whatever the final outcome, transnational environmental damage through the medium of international rivers will be a major international problem in the years to come in Europe and elsewhere.

Transnational damage from oil pollution through the medium of the oceans has been a matter of international discussion for half a century, ever since substantial quantities of oil began to be transported and used by ocean vessels. National legislation to forbid the discharge of oil in coastal ocean waters was enacted in the United States in 1924, two years after similar legislation in Great Britain. Congress took the lead in calling for international action in 1922, which resulted in a Preliminary Conference on Oil Pollution of Navigable Waters in Washington in 1926. Unfortunately, the convention drafted at the conference never received the necessary ratifications.

Despite subsequent efforts by the League of Nations, no success was attained until 1954 with the approval of the International Convention for the Prevention of Pollution of the Sea by Oil. This Convention, which went into effect in 1958 and was ratified by the United States in 1961, was substantially amended in 1962 at the insistence of the United States, and further amendments were adopted in 1969.

121. A detailed discussion of this subject can be found in Sweeney, Oil Pollution of the Oceans, 37 FORDHAM L. REV. 155 (1968). See also Shutler, Pollution of the Sea by Oil, 7 HOUST. L. REV. 415 (1970); Mendelsohn, Maritime Liability for Oil Pollution: Domestic and International Law, 38 GEO. WASH. L. REV. 1 (1969); Note, Oil Pollution of the Sea, 10 HARV. INT'L L.J. 316 (1969).
127. The initial United States ratification was accompanied in the Senate with a
These amendments, which are not yet in force,\textsuperscript{128} have been ratified by the United States.\textsuperscript{129} Although most of the provisions of the Convention were altered by the two successive sets of amendments, its basic focus and limitations remain. In its latest incarnation, it contains three basic elements: it restricts the discharge of oil by most commercial vessels\textsuperscript{130} to small quantities, highly diluted, far from shore;\textsuperscript{131}

recommendation that the Convention be amended in five particulars "at the earliest practicable date." Nevertheless, the amended Convention was not ratified until 1966, four years after the amendments. [1966] 2 U.S.T. 1523, T.I.A.S. No. 6109, 600 U.N.T.S. 332.

\textsuperscript{128} As of June 21, 1971, 64 DEP'T STATE BULL. 812 (1971). The amendments have already been approved by several states, however.


\textsuperscript{130} Certain smaller vessels and "naval ships and ships for the time being used as naval auxiliaries" are excepted, with the provision in relation to the latter that:

Each Contracting Government undertakes to adopt appropriate measures ensuring that requirements equivalent to those of the present Convention are, so far as is reasonable and practicable, applied to the [naval vessels].


The writer can find no indication in either the United States Code Annotated (33 U.S.C.A. § 1001) or the Code of Federal Regulations (33 C.F.R. pt. 151) that the United States had taken any specific action to assure American compliance with this provision prior to the proclamation of Exec. Order 11507, Prevention, Control and Abatement of Air and Water Pollution and Federal Facilities, 3 C.F.R. 91 (Supp. 1970). The thrust of this Order is that "the Federal Government in the design, operation, and maintenance of its facilities shall provide leadership in the nationwide effort to protect and enhance the quality of our air and water resources." Id. § 1. "Facilities" is defined to include vessels [id. § 2(c)], and heads of agencies are directed that "[t]he use, storage, and handling of all materials, including but not limited to, solid fuels, ashes, petroleum products, and other chemical and biological agents, shall be carried out so as to avoid or minimize the possibilities for water and air pollution. When appropriate, preventive measure shall be taken to entrap spillage or discharge or otherwise to prevent accidental pollution." Id. § 4(a)(4). However, "[t]he heads of agencies, in consultation with the respective Secretary, may from time to time identify facilities or uses thereof which are to be exempted, including temporary relief, from provisions of this Order in the interest of national security or in extraordinary cases where it is in the national interest." Id. § 4(c). Whether this provision or some internal administrative regulations bring the United States into compliance with this treaty provision remains to be seen. In any case, the special treatment of military vessels serves as an index of the perceived relative importance of environmental protection and military superiority, especially since compliance with this type of regulation is unlikely to limit significantly the effectiveness of naval vessels.

\textsuperscript{131} Article III

Subject to the provisions of Articles IV [excepting discharges to secure the safety of a ship and damage-caused or unavoidable leakage] and V [delaying the effective date 12 months for discharges of oily mixtures from bilges]:

(a) the discharge from a ship to which the present Convention applies other than a tanker, of oil or oily mixture shall be prohibited except when the following conditions are all satisfied:

(i) the ship is proceeding en route;
it calls for the installation on vessels and in ports of the equipment needed to dispose of oil without endangering ocean waters;\textsuperscript{132} and it provides for record-keeping and the reporting of complaints to the state of registry for action.\textsuperscript{133}

From the point of view of environmental protection, the Convention has several deficiencies. Aside from the special treatment accorded naval vessels,\textsuperscript{134} the limitations as to distance from shore may well be inadequate, given the unsatisfactory experience with the earlier versions of the Convention.\textsuperscript{135} Furthermore, the enforcement provisions still pay homage to the exclusive jurisdiction of the flag state over vessels on the high seas. In case of a violation of the limitations in the Convention, a state that discovers a violation has only one recourse—to report it to the flag state, which, if it is “satisfied that sufficient evidence is available in the form required by its law to enable proceedings against the owner or master of the ship to be taken in respect of the alleged contravention, . . . shall cause such proceedings to be taken as soon as possible.”\textsuperscript{136} In addition, the flag state 

\begin{itemize}
  \item \textsuperscript{(ii)} the instantaneous rate of discharge of oil content does not exceed 60 litres per mile;
  \item \textsuperscript{(iii)} the oil content of the discharge is less than 100 parts per 1,000,000 parts of the mixture;
  \item \textsuperscript{(iv)} the discharge is made as far as practicable from land;
\end{itemize}

(b) the discharge from a tanker to which the present Convention applies of oil or oily mixture shall be prohibited except when the following conditions are all satisfied:

\begin{itemize}
  \item \textsuperscript{(i)} the tanker is proceeding en route;
  \item \textsuperscript{(ii)} the instantaneous rate of discharge of oil content does not exceed 60 litres per mile;
  \item \textsuperscript{(iii)} the total quantity of oil discharged on a ballast voyage does not exceed 1/15,000 of the total cargo-carrying capacity;
  \item \textsuperscript{(iv)} the tanker is more than 50 miles from the nearest land;
\end{itemize}

(c) the provisions of sub-paragraph (b) of this Article shall not apply to:

\begin{itemize}
  \item \textsuperscript{(i)} the discharge of ballast from a cargo tank which, since the cargo was last carried therein, has been so cleaned that any effluent therefrom, if it were discharged from a stationary tanker into clean calm water on a clear day, would produce no visible traces of oil on the surface of the water; or
  \item \textsuperscript{(ii)} the discharge of oil or oily mixture from machinery space bilges, which shall be governed by the provisions of sub-paragraph (a) of this Article.
\end{itemize}


133. \textit{Id.} arts. IX & X, at 6-8.
134. See note 130 \textit{supra}.
135. In April, 1970, Secretary of the Interior Walter J. Hickel called upon ten major oil companies to enter into a voluntary no discharge agreement to protect American coasts, particularly in Alaska, because "currents" and winds affecting Alaska during the winter season can bring in oil from many hundreds of miles out at sea.” \textsc{Clean Air & Water News}, Apr. 10, 1970, at 9.
must report its action to the informants.\textsuperscript{137} The elements of subjective judgment in choosing whether or not to prosecute necessarily loom large in such a provision, and those states which hope to encourage registration of vessels under their flags are not likely to show great vigor in prosecuting reported violations. There are no reported decisions of prosecutions in the United States during the decade of this country's adherence to the Convention.

The sinking of the tanker \textit{Torrey Canyon} on March 18, 1967, in international waters off the coast of Great Britain awakened the world to another serious danger to its coasts and coastal waters, the accidental spillage of oil in large quantities as a result of mishaps involving modern super-tankers.\textsuperscript{138} Great Britain, which after some initial confusion took quasi-military action to limit the extent of damage, called an emergency session of the Inter-governmental Maritime Consultative Organization (IMCO) to set in motion international action covering three subjects: (1) preventive arrangements to minimize the likelihood of such disasters and the extent of the resulting damage, (2) mechanisms for compensation of those injured by such spills, and (3) the authority of states other than the flag state to take action on the high seas to protect their territory.\textsuperscript{139} IMCO established an ad hoc legal committee to work on the latter two of these problems, and the Comite Maritime Internationale, a private lawyers' group which has worked very closely with IMCO, also went to work on the questions. Toward the end of 1969, a forty-nation conference in Brussels under IMCO auspices produced two international agreements, which are not yet in force.\textsuperscript{140}

The \textit{International Convention on Civil Liability for Oil Pollution Damage} makes the owner of a ship at the time of an incident liable "for any pollution damage caused by oil which has escaped or been discharged from the ship as a result of the incident" unless it was caused by military or exceptional natural phenomenon, an intentional

\textsuperscript{137} \textit{Id.}

\textsuperscript{138} For a detailed consideration of the legal ramifications of the \textit{Torrey Canyon} disaster, see Nanda, \textit{The "Torrey Canyon" Disaster: Some Legal Aspects}, 44 \textit{Denver L.J.} 400 (1967); Utton, \textit{Protective Measures and the "Torrey Canyon"}, 9 B.C. IND. & COM. L. REV. 613 (1968).

\textsuperscript{139} See \textit{House Report on Third Extraordinary Session of IMCO on International Control of Oil Pollution}, supra note 11.

\textsuperscript{140} The agreements are the \textit{International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties}, reproduced at 9 Int'l Legal Mats. 25 [hereinafter cited as \textit{Intervention Convention}], and the \textit{International Convention on Civil Liability for Oil Pollution Damage}, [\textit{Id.} at 45] [hereinafter cited as \textit{Civil Liability Convention}]. The United States ratified the \textit{Intervention Convention} at the same time that it ratified the 1969 Amendments to the Int'l Convention for the Prevention of Pollution of the Sea by Oil, 9 \textit{Int'l Legal Mats.} 1 (1970). The \textit{Civil Liability Convention} was not approved at that time.
act of a third party, or the negligence or wrongful act of the government responsible for maintaining navigational aids.\textsuperscript{141} Liability is limited to $134 per net ton (2,000 francs) up to a maximum of $14 million (210 million francs), assuming the owner establishes a fund of that amount with the court of the state where the damage has occurred.\textsuperscript{142} Each vessel that carries more than 2,000 tons of oil as cargo must maintain insurance or other financial security and carry a certificate showing its existence.\textsuperscript{143}

The International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties provides that, after consultation with the flag state and the owners,

\begin{quote}
parties to the present Convention may take such measures on the high seas as may be necessary to prevent, mitigate or eliminate grave and imminent danger to their coastline or related interests from pollution or threat of pollution of the sea by oil, following upon a maritime casualty or acts related to such a casualty, which may reasonably be expected to result in major harmful consequences.\textsuperscript{144}
\end{quote}

This permission is limited: it does not apply to warships or other governmental non-commercial vessels;\textsuperscript{145} the measures taken must be

\textsuperscript{141} Civil Liability Convention, art. III, 9 Int'l Legal Mats. 47-48 (1970).
\textsuperscript{142} Id. art. V, at 48.
\textsuperscript{143} Id. art. VII, at 52.
\textsuperscript{144} Intervention Convention, art. I, 9 Int'l Legal Mats. 25.
\textsuperscript{145} Id. art. I, ¶ 2, at 25-26.
proportionate to the actual or threatened damage; and they must not exceed what is necessary to accomplish the purpose.\textsuperscript{146} Actions beyond the scope of the Convention are compensable,\textsuperscript{147} and an Annex of nineteen articles provides detailed compulsory dispute settlement machinery for controversies over breach of the Convention or amount of compensation.\textsuperscript{148}

The limitations of these two Conventions are, by and large, readily apparent.\textsuperscript{149} Again, warships receive special treatment. The Conventions are limited to oil pollution, although the United States would have preferred a broader civil liability coverage.\textsuperscript{150} On the intervention aspect of other pollution threats, the Conference contented itself with a Resolution on International Co-operation Concerning Pollutants Other Than Oil, which recommended that
\begin{quote}
contracting States which become involved in a case of pollution danger by agents other than oil co-operate as appropriate in applying wholly or partially the provisions of the Convention [Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties].\textsuperscript{151}
\end{quote}

The issue of civil liability in such circumstances was not mentioned. Similarly, although establishment of a fund to assure adequate resources for clean-up efforts had been widely discussed,\textsuperscript{152} the Conference could only agree on a resolution\textsuperscript{153} requesting that the IMCO legal committee prepare a draft for a compensation scheme\textsuperscript{154} and that IMCO call an-

\begin{quote}
\textbf{Article V}
\begin{enumerate}
\item Measures taken by the coastal State in accordance with Article I shall be proportionate to the damage actual or threatened to it.
\item Such measures shall not go beyond what is reasonably necessary to achieve the end mentioned in Article I and shall cease as soon as that end has been achieved; they shall not unnecessarily interfere with the rights and interests of the flag State, third States and of any persons, physical or corporate, concerned.
\item In considering whether the measures are proportionate to the damage, account shall be taken of:
\begin{enumerate}
\item the extent and probability of imminent damage if those measures are not taken; and
\item the likelihood of those measures being effective; and
\item the extent of the damage which may be caused by such measures.
\end{enumerate}
\end{enumerate}
\end{quote}

\textit{Id.}, art. V, at 28-29.
\textsuperscript{146} Id. art. VI, at 29.
\textsuperscript{147} Id. art. VIII, at 30, 36-44.
\textsuperscript{149} See \textit{Id.} art. VI, at 29.
\textsuperscript{150} See Liability for Pollution of the Seas, \textit{supra} note 16. See also note 203 infra.
\textsuperscript{151} 9 Int'l Legal Mats. 65 (1970).
\textsuperscript{152} See Nanda, \textit{International Liability Trust Fund}, \textsc{Trial}, Aug.-Sept. 1968, at 50; sources cited notes 121 and 138 \textit{supra}.
\textsuperscript{153} 9 Int'l Legal Mats. 66 (1970).
\textsuperscript{154} According to the Resolution, the compensation scheme was to be founded on two principles:
\begin{enumerate}
\item Victims should be fully and adequately compensated under a system based upon the principle of strict liability,
other conference to consider it. In short, the Conventions represent a first step toward solution of a very narrow, if important, problem: subsequent oil pollution disasters like the sinking of the *Torrey Canyon*.

It is important to note for purposes of the analytical categories used in this paper that protection of the world's beaches and protection of the marine ecology itself are not synonymous. None of the three Conventions on oil pollution is designed to protect the ocean waters themselves, notwithstanding the language of a Report of the United Nations Secretary-General that the 1969 amendments to the International Convention for the Prevention of Pollution of the Sea by Oil "reflect the concept of total prohibition of oil discharge, apart from certain necessary exemptions." They require only that the discharge be (a) dilute, and (b) far from shore. The degree of dilution does not in itself reduce the total amount of oil dumped into the sea and the corresponding long-term ecological impact, although it may minimize the immediate effects at the point of discharge and at the nearest shore. Similarly, the discharge of oil beyond fifty miles from shore and/or "as far as practicable from land" does not protect marine resources from oil pollution damage: it only protects the shore. The 1969 Brussels Conventions show the same narrow focus. The Civil Liability Convention avoids any definition of the kinds of damage which are compensable, other than to limit it to "damage caused on the territory including the territorial sea of a Contracting State and to preventive measures taken to prevent or minimize such damage," and under existing Anglo-American law no one would be able to recover for injury to the marine environment because of a lack of a possessory interest. The Intervention Convention includes "conservation of living marine resources and of wildlife as a "related interest," whose grave and imminent danger may justify state action

2. The fund should in principle relieve the shipowner of the additional financial burden imposed by the present Convention [on Civil Liability for Oil Pollution Damage].

*Id.* at 67; see note 154 *supra*.


156. See materials cited note 208 *infra*.


159. Possession as a prerequisite to ownership and rights in wild animals is a long-settled doctrine of Anglo-American law. *McKee v. Gratz*, 260 U.S. 127 (1922); *Young v. Hichens*, 6 Q.B. 606 (1844); *Pierson v. Post*, 3 Cai. R. 175, 2 Am. Dec. 264 (N.Y. Sup. Ct. 1805). Liability for damages suffered by businesses without a property nexus, such as hotels, are also subject to doubt. See *Sweeney*, *supra* note 121, at 175.


161. *Id.* art. I, ¶ 1, at 25.
on the high seas, but there is no requirement that the action taken be limited in such a way as to protect the marine environment or even that such considerations be taken into account.\textsuperscript{162} This concern is not merely hypothetical; research following the use of detergents to clean up after the \textit{Torrey Canyon} disaster indicated that the detergent was far more lethal to marine micro-organisms than was the oil itself.\textsuperscript{163} These comments are not intended to suggest that protection of private or state property interests—as distinct from the shared resources like the air and oceans themselves—is an unimportant object; the point here is simply that protection of these specific rights, which is the focus of these Conventions, is not necessarily sufficient to protect the total environment from destructive effects.

A closely related problem is the recurrent pollution of coastal areas as a result of off-shore oil operations.\textsuperscript{164} While the amount of oil being produced by this process so far is small compared to the total amount of oil consumed,\textsuperscript{165} it presents great dangers because of its potentiality for serious pollution of coastal areas. A spill may result from either a failure or neglect of the equipment used, as in the case of the Louisiana oil spill of 1970, or geological conditions of the sea floor which produce "leaks" or "seepage" through the floor itself, as was the case in the Santa Barbara oil spill of 1969. However it arises, the effect is often to coat nearby shores with oil. So far, such exploitation has been within territorial waters or at least on portions of the continental shelf which are under national jurisdiction, so that direct national regulation of these operations has been possible.\textsuperscript{166} International regulation in this field has contented itself with requiring states to impose adequate regulations, without making any attempt to define the nature or stringency necessary.

At the 1958 United Nations Conference on the Law of the Sea, provisions were inserted in two Conventions to deal with this subject. The Geneva Convention of the High Seas contains in Article 24 a general requirement that

\textit{[e]very State shall draw up regulations to prevent pollution of the seas by the discharge of oil from ships or pipelines or resulting from

\hspace{1em} \textsuperscript{162} By contrast, special reference is made to avoiding any risk to human life, \textit{id.} art. III(e), even though such precautions are far more likely even if not mentioned than are efforts to protect the marine environment.

\hspace{1em} \textsuperscript{163} See \textit{House Report on Third Extraordinary Session of IMCO on International Control of Oil Pollution, supra} note 11.

\hspace{1em} \textsuperscript{164} See generally, \textit{Note, Continental Shelf Oil Disaster: Challenge to International Pollution Control, 55 Cornell L. Rev.} 113 (1969); Shutler, \textit{supra} note 121.

\hspace{1em} \textsuperscript{165} Note, \textit{Continental Shelf Oil Disaster: Challenge to International Pollution Control, supra} note 164, at 115, n.17.

\hspace{1em} \textsuperscript{166} See text accompanying notes 251-53 infra.
the exploitation and exploration of the seabed and its subsoil, taking account of existing treaty provisions on the subject.\textsuperscript{167}

The more specific provisions appear in Article 5 of the 1958 Geneva Convention on the Continental Shelf, which prohibits "any unjustifiable interference with navigation, fishing or the conservation of the living resources of the sea,"\textsuperscript{168} while permitting the establishment of "installations and other devices" necessary for exploitation of the Continental Shelf and the creation of a 500-meter safety zone around them for protection. Within these zones,

[t]he coastal State is obliged to undertake, . . . all appropriate measures for the protection of the living resources of the sea from harmful agents.\textsuperscript{169}

Some states have responded by establishing such standards,\textsuperscript{170} but the absence of any specific standards or any mechanism for establishing such standards or inquiring into existing national standards makes these treaty provisions of relatively little practical significance. They do, however, establish the principle of the necessity for regulation and imply international responsibility in case of transnational damage resulting from the absence of, or inadequate, regulations. Since the damage from offshore oil spills is most likely to affect only the licensing state's coasts, occasions of international claims will probably be rare.

2. Airborne Transnational Pollution

There is very little to report in the way of international agreements on airborne transnational pollution. The International Joint Commission created by the United States-Canadian Boundary Waters Treaty of 1909\textsuperscript{171} has investigated air pollution problems since the Trail Smelter case\textsuperscript{172} under Article IX of the Treaty which permits reference of

... any other questions or matters of difference arising between [the Parties] involving the rights, obligations, or interests of either

\textsuperscript{169} Id. at 474, art. 5, ¶ 7.
\textsuperscript{170} Great Britain enacted the Continental Shelf Act 1964, c. 29, which implements the Geneva Convention on the High Seas provisions on off-shore oil activities. In the United States, the Secretary of the Interior is authorized under the Outer Continental Shelf Lands Act of 1953, 43 U.S.C. §§ 1331 et seq. (1971), to prescribe rules governing such activities, currently collected in 30 C.F.R. pt. 250 (1971). These rules were significantly strengthened after the Santa Barbara oil spill in 1969.
\textsuperscript{172} See Trail Smelter Arbitration, 3 U.N.R.I.A.A. 1905 (1941), 35 AM. J. INT'L L. 684 (1941); Read, The Trail Smelter Dispute, supra note 45, at 215.
in relation to the other or to the inhabitants of the other, along the common frontier . . . .

In addition to the Trail Smelter dispute, three other problems relating specifically to air pollution have been referred to the I.J.C. The studies of these problems have helped to clarify the extent and sources of air pollution across the United States-Canadian boundary, but no further international action has resulted. Recent commentators have suggested some steps to strengthen the substantive and organizational provisions of the Boundary Waters Treaty to come to grips more effectively with this problem.

In Europe, Norway in particular has expressed deep concern over the effects of transnational air pollution damage, and European regional organizations have become involved with these problems in recent years. As yet, however, no action has been taken in the form of international agreements either imposing standards or establishing state responsibility in case of damage. This latter problem is often complicated by the practical difficulties of tracing the source of the

176. See N.Y. Times, Jan. 11, 1970, § 1, at 24, col. 1, for an account of the "black snow" which fell on eastern Norway and western Sweden. The blackness was caused by combustion pollutants thought to have come from the air over the Ruhr in West Germany. These wastes normally would disperse in the atmosphere, but were trapped by an atmospheric inversion.
damaging pollutants in industrialized Europe. The inability to pinpoint specific sources of injury makes more urgent the creation of standards which will limit pollution from all sources. If performance in the field of water pollution is any guide, the Council of Europe is likely to be the first organization to produce concrete proposals on these questions.

3. Radioactive Pollution

Perhaps the most active area of concern over transnational environmental damage has grown out of the proliferation of nuclear projects, both military and peaceful. Of overriding importance is the 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, which ended those nuclear tests that were contaminating the environment beyond the territory of the testing state, as in the case of the Japanese fishing vessels. Although the agreement was conceived primarily as a first step toward disarmament, the growing public concern and international protests over the impact of radioactive fallout on human beings was an important consideration in its negotiation. France and China have nevertheless continued atmospheric testing, and the resulting transnational damage has led to continued diplomatic protests. As recently as September 1971, the Chilean Senate approved a resolution asserting that French Pacific nuclear testing had contaminated snow in the Chilean Andes and suggesting that the Chilean President break diplomatic relations with France if that seemed an appropriate step. Of course the Treaty, to the extent it has been effective, has not only prevented specific transnational damage, but has also cut down the further pollution of

178. In the case of the Norwegian "black snow," the difficulties are quite apparent:

The Norwegian scientists acknowledge that pollution sources also exist within Norway. The Institute, a public supported agency, is studying how to curb sulphur pollution from a cellulose plant in southern Norway, at the request of the company. The Norwegians also acknowledge that other industrial nations are not totally indifferent to their responsibilities for controls.

The problem lies in finding economical and reliable methods of identifying sources of pollution so that control measures can be applied in the right places. The use of tracer chemicals is a possibility, but this entails the introduction of tracers in the thousands of oil and coal-burning sources, the scientists said.

However, Dr. Lund said, "although we have to make some inferences about the Ruhr, there cannot be any doubt that England is a problem for us. The prevailing winds are southwesterly. And it is the rivers in southwest Norway, where we have no pollution sources, that have shown increasing acidity."


the shared resources of the biosphere itself.181

In relation to the peaceful uses of nuclear energy, substantial efforts were undertaken to reach international agreement upon principles of liability to third parties in case of nuclear accidents. Multilateral agreements were drafted under the auspices of the European Nuclear Energy Agency in 1960 on Third Party Liability in the Field of Nuclear Energy182 and under the auspices of the International Atomic Energy Agency (IAEA) in 1963 on Civil Liability for Nuclear Damage.183 A special-purpose Brussels Convention on the Liability of Operators of Nuclear Ships was also prepared in 1962 under the auspices of the Comite Maritime Internationale.184 The principles of liability established by these treaties are all fundamentally similar.185 They provide for liability for all nuclear damage without regard to fault or privity, with the exception of certain force majeure considerations. The liability is channeled exclusively to the licensed operator of the facility, whose liability is limited to certain maximum amounts. Financial security is required of the operator, and the Contracting State must assist in providing such security to the extent necessary. Statutes of limitations and limitations on the eligible national courts which may hear claims under the Conventions are established to harmonize the provisions of State law on these matters and to avoid multiple litigation. Despite the apparent consensus among the States preparing these various draft conventions on the general principles which should govern this field, none of them had received enough ratifications to enter into effect by December 1969.186 In part this represents objection to specific provisions by key states, such as the refusal of both the United States and the Soviet Union to submit nuclear warships to the provisions of the Brussels Convention. In part it represents the low level of progress in most states toward peaceful use of nuclear energy and a corresponding lack

181. See text accompanying note 280 infra.
182. The text of this draft is found at 55 AM. J. INT'L L. 1082 (1961); see also Misc. No. 13, ADD'L PROTOCOL TO THE PARIS CONVENTION OF JULY 29, 1960, CMDN. No. 2356 (1964). A brief description of the original agreement appears in Berman & Hydeman, Notes and Comments: A Convention on Third Party Liability for Damage from Nuclear Incidents, 55 AM. J. INT'L L. 966 (1961). In 1963, several European States signed a Supplementary Convention, 2 INT'L LEGAL MATS. 685 (1963), to increase the amount of compensation under the original Convention.
184. The text of this Convention appears in IAEA Legal Series No. 4, at 36.
185. For more complete descriptions of these treaties, see Cigoj, International Regulation of Civil Liability for Nuclear Risk, 14 INT'L & COMP. L.Q. 809 (1965); P. SZASZ, THE LAW AND PRACTICES OF THE INTERNATIONAL ATOMIC ENERGY AGENCY 703-14, 723-24 (I.A.E.A. Legal Series No. 7, 1970).
of interest in regulation. The IAEA has also devoted some attention to the problems of emergency assistance, social insurance for employees at nuclear facilities, and liability in connection with the transportation of nuclear materials, but no proposed solutions have yet progressed to the point of conclusion of draft conventions.

The IAEA Statute requires that health and safety standards be imposed upon all IAEA projects, and such standards are sometimes applied to State facilities by agreement. These standards also serve as guidelines for the Member States in drafting their own national health and safety regulations.

4. Weather Modification

Another problem which presents the threat of transnational environment damage is weather modification. Present technology already permits localized alterations of weather patterns, and one commentator has flatly asserted that "present scientific developments and possibilities cannot be coped with adequately by the existing international neighborhood principles." The World Meteorological Organization Commission for Atmospheric Sciences has established a Working Group on Cloud Physics which is exploring the technical aspects and potential impact of artificial control of clouds and precipitation, but the field has yet to receive high level governmental scrutiny on the international plane.

5. Space Vehicles

The launching of several hundred earth satellites and other vehicles into outer space has created a new source of potential transnational injury. Some satellites are orbited sufficiently close to the earth that the atmosphere creates a small amount of "drag," slowing the velocity of the vehicle and leading ultimately to its return to earth like a meteorite. Other kinds of space vehicles and rocket boosters are designed to return to earth, but may not always come down at the in-

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188. Id. at 716-23.
189. Id. at 661-62.
190. Id. at 666-67, 679-80.
tended point. In addition there is the possibility of a failure of a launch attempt resulting in injury to another state. While some of these problems are not primarily of an environmental character, the use of the earth and its atmosphere as a disposal unit for expended satellites and rocket boosters represents an environmental threat which could cause transnational injury.

In June 1971, after nine years of study and negotiation on the most complex questions facing it, the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space announced agreement on a Draft Convention on International Liability for Damage Caused by the Launching of Objects into Outer Space. The draft convention envisages three types of injury-producing incidents: a space object colliding with the earth's surface or aircraft in flight; two space objects colliding; and a collision of two space objects with resulting damage to a third state's space object, aircraft in flight, or surface. The basic principles of liability are that responsibility for injury to space objects shall be allocated according to fault, and responsibility for injury to aircraft in flight or to the surface shall be absolute.


195. Outer Space Liability Draft Convention, supra note 194, arts. II, III, and IV.

196. 

**Article II**

A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight.

**Article III**

In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.

**Article IV**

1. In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, and of damage thereby being caused to a third State or to its natural or juridical persons, the first two States shall be jointly and severally liable to the third State, to the extent indicated by the following:

   (a) If the damage has been caused to the third State on the surface of the earth or to aircraft in flight, their liability to the third State shall be absolute;

   (b) If the damage has been caused to a space object of the third State or to persons or property on board that space object elsewhere than on the surface of the earth, their liability to the third State shall be based on the fault of either of the first two States or on the fault of persons for whom either is responsible.

2. In all cases of joint and several liability referred to in paragraph 1, the burden of compensation for the damage shall be apportioned between the
Although legal action in the courts of the launching state is not prohibited, exhaustion of remedies is not required. The draft convention lays primary emphasis upon relief through diplomatic channels by the state of the nationality of the victim, the state in which his injury occurred, or the state of his permanent residence, in that order of priority. In this respect the treaty is much more tradition-bound than the Brussels Convention on Civil Liability for Oil Pollution Damage, which makes use of national courts to adjudicate claims and distribute the compensation fund. Instead the Outer Space Liability treaty provides that claims which are not settled through diplomatic channels shall be heard by an ad hoc claims commission of the conventional three-member variety whose decisions are only recommendatory unless the parties agree otherwise. This failure to make use of either national courts or the International Court of Justice no doubt reflects the necessity of drafting an agreement which would be acceptable to all of the states presently carrying on space activities.

In another respect, however, the Outer Space Liability treaty is more forward-looking: it contains no limitation of amount of liability, as do virtually all of the international treaties dealing with liability-creating conduct. This feature is apparently the result of pressure from the states that are not presently engaged in space activities, who see themselves only as potential victims of space mishaps. The treaty also breaks ground in its explicit recognition of the international status of intergovernmental organizations that conduct space activities, providing for liability of the organization in the first instance with the member states responsible in case of non-payment by the organiza-

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first two States in accordance with the extent to which they were at fault; if the extent of the fault of each of these States cannot be established, the burden of compensation shall be apportioned equally between them. Such apportionment shall be without prejudice to the right of the third State to seek the entire compensation due under this Convention from any or all of the launching States which are jointly and severally liable.

Id. at arts. VIII-XI.

197. Id. at arts. VIII-XI.

198. See note 140 supra.

199. Outer Space Liability Draft Convention, supra note 194, arts. XIV-XX.

200. See Dembling & Arons, supra note 194, at 336, 353-56, for a description of the various positions and changes in positions on these issues during the negotiations. U.N. Doc. A/AC/105/C.2/W.2/Rev.3 (1965), reproduced as an appendix to Dembling & Arons, is a comparative table of provisions of the Belgian, American, and Hungarian proposals.

201. E.g., The Warsaw Convention on Unification of Certain Rules Relating to International Transportation by Air, Oct. 12, 1929, 49 Stat. 3000 (1936), T.S. No. 876 (effective Oct. 29, 1934), and its most recent amendments, 10 Int'l Legal Mats. 613 (1971); The Brussels Convention on Civil Liability for Oil Pollution Damage, supra note 140 and the various draft conventions on liability for nuclear accidents, supra notes 182-184.
As international organizations become more active in providing economic and technical aid, it may be important that they be subject to liability for a variety of environmentally injurious acts, and the provisions of this treaty lay the groundwork for establishing such liability.

6. **Commentary on Current Treaties**

This review of existing treaties, most of which are not yet in force, indicates that a slow, piecemeal approach dominates governmental efforts, dealing separately with various special aspects of transnational environmental injury. The danger of this approach is that it is likely to leave us, in the words of a United States Government memorandum, "one convention behind the next major pollution disaster," not only

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202. **Article XXII**

1. In this Convention, with the exception of Articles XXIV to XXVII [relating to signature, ratification, amendment, and withdrawal], references to States shall be deemed to apply to any intergovernmental organization which conducts space activities if the organization declares its acceptance of the rights and obligation provided for in this Convention and if a majority of the States members of the organization are States Parties to this Convention and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

2. States members of any such organization which are States Parties to this Convention shall take all appropriate steps to ensure that the organization makes a declaration in accordance with the preceding paragraph.

3. If an international intergovernmental organization is liable for damage by virtue of the provisions of this Convention, that organization and those of its members which are States Parties to this Convention shall be jointly and severally liable; provided, however, that:

   (a) any claim for compensation in respect of such damage shall be first presented to the organization; and

   (b) only where the organization has not paid, within a period of six months, any sum agreed or determined to be due as compensation for such damage, may the claimant State invoke the liability of the members which are States Parties to this Convention for the payment of that sum.

4. Any claim, pursuant to the provisions of this Convention, for compensation in respect of damage caused to an organization which has made a declaration in accordance with paragraph 1 of this Article shall be presented by a State member of the organization which is a State Party to this Convention.

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203. **Liability for Pollution of the Seas**, supra note 150, at 951. The memorandum dealt with the scope of coverage of the then inchoate Brussels Convention on Civil Liability for Oil Pollution Damage, but the thrust on its logic goes far deeper:

The United States does not believe that the prototype convention limited to damage from oil pollution is worth pursuing. Pollution damage from any cargo, or some broad list of cargo, is necessary to meet known potential problems; we do not want to be one convention behind the next major pollution disaster. This being so, the difficulty of securing general acceptance of any convention, and the need for uniformity, seem to preclude a number of conventions on different kinds of pollution. . . . The damage covered should only be limited by a requirement for proximate cause and
because of the slow process of drafting and signing a large number of conventions, but because of the inevitable delays in ratification. The fundamental features of these various conventions are quite similar:

1. Liability of the operator of the activity is established,
2. State regulation of private operators is required,
3. International minimum standards or guidelines are proposed,
4. Operators are required to provide and demonstrate financial capacity to compensate potential losses,
5. Procedures are established to dispose of claims in an efficient and equitable manner, and
6. Protective measures by potential victim states are permitted where net injury to all concerned can thereby be minimized.

Not all of the foregoing conventions contain all of these features, and not all reach the same result with respect to the appropriate method of dealing with each item. But no persuasive reasons appear to justify the variations between the several conventions. One broad-ranging international agreement on these matters applicable to all forms of transnational environmental injury seems equally amenable to drafting and potentially a far more effective solution to the substantive and procedural uncertainties of existing general international law. If special circumstances must be considered, they can be added to this general framework through additional protocols or international machinery established for the purpose. In the meantime, the general convention would provide the necessary substance and procedure for efficient national and private environmental planning and disposition of related international claims.

III

ACTIVITIES AFFECTING SHARED RESOURCES

Since the time of Grotius,\(^{204}\) the international community has recognized that certain resources of this globe are "shared resources"; that is, they are not subject to national appropriation but are open to the "reasonable" use of all states. Before the Twentieth Century the only shared resources which raised any practical concern were the ocean waters and the living resources they contained. Before the Twentieth Century the only shared resources which raised any practical concern were the ocean waters and the living resources they contained. In this century, however, it has become technically possible to make use of and to as-

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proof of loss, not by type of damage of by class of persons or property affected.

assert control over other resources which had previously been immune to effective national claims: first the atmosphere, then outer space and celestial bodies, and most recently the ocean floor and the earth's crust have come within the reach of those states able to take advantage of the most advanced technology. The more interdependent international community of our times has realized the desirability of open use of these resources, although the first stage of developments with respect to both airspace and the seabed was the assertion of exclusive national claims, and their status as shared resources is not unequivocally settled.

Inevitably, the same explosion of technical capacity which has made possible the shared use of these "new" resources has created the necessity for new limitations on their use. Once thought inexhaustible—or their exhaustion beyond human control, as in the case of fisheries—the aggressive use of these "free" resources in recent years has led to serious threats of depletion and ecological disruption. Modern science has made us increasingly aware of the unreasonableness of many "reasonable" uses which modern technology has made possible.

As a result, more attention is being devoted to the development of appropriate international restrictions on the use of these resources. The negotiation of such restrictions is doubly difficult because of the dangers equally inherent in non-agreement and in agreement on ecologically inadequate regulation. The perceived seriousness of the dangers to the oceans and their living resources has already led in some cases to national legislation which threatens to undermine their shared resource character. Failure to agree upon substantial international regulations in these fields is creating a real possibility that the international regime of shared use will collapse completely. This possibility

205. The category of "shared resources" might be thought to include other matters of concern such as endangered species and cultural landmarks of world-wide interest. The United Nations Conference on the Human Environment has established an Intergovernmental Working Group on Conservation which is considering draft conventions on Conservation of the World Heritage, U.N. Doc. A/CONF.48/IWGCI/13 (Oct. 11, 1971), Conservation of Certain Islands for Science, U.N. Doc. A/CONF.48/IWGCI/1/12 (Oct. 11, 1971), Conservation of Wetlands of International Importance, U.N. Doc. A/CONF.48/IWGCI/4, Annex I (July 30, 1971), and Export, Import and Transit of Certain Species of Wild Animals and Plants, U.N. Doc. A/CONF.48/IWGCI/6, Annex I (July 1971). These "shared resources," however, unlike those mentioned in the text, are at present both legally and physically under the control of various states. International agreements on these matters are needed primarily to reinforce national policies of conservation rather than to bring under international management resources which are inherently beyond the control of individual states. Of course the global economic and social impact of these national conservation regulations may create a need for international controls over these national regulations along the lines discussed in text at Part IV, infra.

206. See notes 211 & 228 infra.
has been one of the driving forces behind the efforts to establish an effective system of international regulation.

At the same time it must be recognized that the preservation of these shared resources in a form adequate to the needs of the global ecological system is not necessarily synonymous with the establishment of a regime which satisfies the economic interests or legal claims of all states. A "conservation" regime which systematically allows overfishing may leave everyone happy except the fish and future generations of humans. A "pollution control" regime which permits the addition to the atmosphere of large quantities of carbon dioxide or particulates injurious to no one may nevertheless sow the seeds of destruction for the ecosystem. But who has standing to assert a claim on behalf of the future or the total ecosystem? The capacity of men to think of the future when the present is making such pressing demands for short-term benefits will be sorely tested in the coming attempts to establish international control over the use of the shared resources of the globe. The following pages will survey the current status of these resources, discussing each in terms of first, the threats to their continued functioning as essential elements of the global ecological system, second, the extent to which these resources are currently recognized as "shared resources" by the international community, and third, the prospects for international action to regulate their use effectively to prevent the breakdown of essential ecosystem functions.

A. Ocean Waters

In the last few years it has become apparent that even the vast expanses of the oceans, covering seventy percent of the globe, are not immune from deterioration caused by human abuse. While the actual effects on the quality of the ocean water and the life that depends on it are largely unknown, the addition of quantities of oil, pesticides, heavy metals, poison gas, sewage, radioactive wastes, and other materials threatens to alter its ecology significantly.\(^{207}\) Oil in particular has been found in the oceans in incredible quantities, apparently coating the whole Sargasso Sea with tarlike lumps.\(^{208}\) The accumulation of toxic materials like DDT in the oceans, either from rainwater runoff or aerial spraying, with their now well-known deleterious effects,\(^ {209}\)

207. General discussions of the problem of ocean pollution can be found in Schachter & Serwer, Marine Pollution Problems and Remedies, 65 AM. J. INT'L L. 84 (1971) and in Note, Ocean Pollution: An Examination of the Problem and an Appeal for International Cooperation, 7 SAN DIEGO L. REV. 574 (1970).


has not been subjected as yet to any international regulation. On the contrary, the United Nations Food and Agriculture Organization has encouraged the continued use of DDT because of its economic advantages over other pesticides with shorter lifespans.\textsuperscript{210}

The problem of intentional ocean dumping has also become a matter of great international concern in recent years, although no international agreements dealing primarily with this subject have yet been adopted.\textsuperscript{211} The international ramifications of ocean dumping became apparent in the summer of 1970 when the United States Army decided to dispose of some 400 “coffins” of obsolete nerve gas weapons encased in concrete by dumping them into the ocean more than 250 miles off the coast of Florida. In addition to the generally hostile reaction in the United States,\textsuperscript{212} there was substantial international opposition. The Prime Minister of the Bahamas expressed his opposition and asked the British government to protest the American action on its behalf,\textsuperscript{213} insisting that the dumping be halted “until probable consequences can be determined by scientists of international repute or by an appropriate international body” such as the International Court of Justice.\textsuperscript{214} Not only did the British voice concern,\textsuperscript{215} but United Nations Secretary-General U. Thant stated\textsuperscript{216} that the American action

\textsuperscript{210} N.Y. Times, Nov. 29, 1969, at 1, col. 5.
\textsuperscript{211} The dumping of radioactive wastes into the oceans has been provided for:
\begin{itemize}
  \item \textbf{Article 25}
    \begin{enumerate}
      \item Every State shall take measures to prevent pollution of the seas from the dumping of radio-active waste, taking into account any standards and regulations which may be formulated by the competent international organizations.
      \item All States shall cooperate with the competent international organizations in taking measures for the prevention of pollution of the seas or air space above, resulting from any activities with radio-active materials or other harmful agents.
    \end{enumerate}
\end{itemize}

Convention on the High Seas, \textit{done} Apr. 29, 1958, [1962] 2 U.S.T. 2312, T.I.A.S. No. 5200, 450 U.N.T.S. 82. This provision was intended primarily as an attack on radioactive waste disposal and United States nuclear testing. \textit{See} M. \textsc{McDougall} \& W. \textsc{Burke}, \textit{The Public Order of the Oceans} 852-68 (1962).


\textsuperscript{213} N.Y. Times, Aug. 4, 1970, at 48, col. 3. The Associated Press quoted the Bahamian Acting Prime Minister as saying, “I’ve heard nothing of this. If it’s in any way dangerous to either fish life or human life, we will be making the strongest protest to the U.S. Government.” N.Y. Times, Aug. 4, 1970, at 1, col. 4.

\textsuperscript{214} N.Y. Times, Aug. 4, 1970, at 1, col. 4.
contravened General Assembly Resolution 2340\textsuperscript{217} and the 1958 Geneva Convention on the High Seas.\textsuperscript{218} Shortly thereafter, the United Nations Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction unanimously adopted a statement requesting its Chairman to convey to the Secretary-General its concern about the practice of dumping toxic materials into the ocean, “which has been brought to public attention by the decision, since implemented, of the United States to dump a certain quantity of nerve gas in the Atlantic Ocean,” and appealing to all nations to refrain from such practices.\textsuperscript{219}

Not all of the criticism based on international law came from abroad. Senator Claiborne Pell said that the ten-day notice did not provide adequate time for the consultation required by the Geneva Convention on the High Seas, and Representative Richard McCarthy pointed out that the United Nations was not consulted before the announcement.\textsuperscript{220} The New York Times concluded its editorial with the statement:

The United States Government has no right to dump into international waters perilous pollutants whose effects its experts cannot predict with any certainty.\textsuperscript{221}

These adverse evaluations of the international legal position of the United States must have been particularly disquieting to the government because the 1969 Military Procurement Act expressly prohibited the use of any funds for “disposal of any lethal chemical or any biological warfare agent outside the United States” if the Secretary of State determines that it will violate international law.\textsuperscript{222} It also pro-

\textsuperscript{217} There appears to be no operative language in G.A. Res. 2340, 22 U.N. GAOR Supp. 16, at 14, U.N. Doc. A/6716 (1967), which even addresses itself to this proposition, although there is preambular language which talks of “the importance of preserving the sea-bed and the ocean floor . . . from actions and uses which might be detrimental to the common interests of mankind,” (preamble para. 6) and of “exploration and use . . . in accordance with the purposes and principles of the Charter of the United Nations, in the interest of maintaining international peace and security and for the benefit of all mankind,” (preamble, para. 4). It is clear, however, from G.A. Res. 2574D, 24 U.N. GAOR Supp. 30, at 11, U.N. Doc. A/7630 (1969) and from G.A. Res. 2749, 25 U.N. GAOR Supp. 28, at 24, U.N. Doc. A/8028 (1970), adopted after this incident, that there is an inclusive community authority over these resources. See the discussion of the ocean floor as a community resource at text accompanying notes 248-68 infra.

\textsuperscript{218} Presumably art. 25(2), supra note 211, which requires cooperation with the “competent international organization.”


\textsuperscript{220} N.Y. Times, July 31, 1970, at 41, col. 4.


\textsuperscript{222} None of the funds authorized by this Act or any other Act shall be used for the future testing, development, transportation, storage, or disposal of any lethal chemical or any biological warfare agent outside the
vided that reports be made to Congress and to the appropriate international organizations where required by treaty or other international agreement. According to a report was made to Congress, asserting the legality of the disposal without mention of Article 25 of the Geneva Convention on the High Seas. The nerve gas controversy, coupled with the recent discovery of high levels of mercury in Lake Erie fish and ocean swordfish and the alleged creation of "dead" areas in the Atlantic as a result of municipal sludge dumping have made the control of ocean pollution a high priority international concern.

The shared resource character of the high seas is virtually undisputed, and the concept is codified in Article 2 of the Geneva Convention of the High Seas:

The high seas being open to all nations, no State may validly purport

United States if the Secretary of State, after appropriate notice by the Secretary [of Defense] whenever such action is contemplated, determines that such testing, development, transportation, storage, or disposal will violate international law. The Secretary of State shall report all determinations made by him under this paragraph to the President of the Senate and the Speaker of the House of Representatives, and to all appropriate international organizations, or organs thereof, in the event such report is required by treaty or other international agreement.


226. N.Y. Times, Mar. 27, 1971, at 56, col. 4. In response to a Presidential request, the Council on Environmental Quality studied the problem, and on October 7, 1970, President Nixon sent a message to Congress recommending the regulation of all ocean dumping. 1 ER—Fed. LAWS 21:0281. Under the proposal, introduced as the Marine Protection Act of 1971, H.R. 4723 and S. 1238, 92d Cong., 1st Sess., the Environmental Protection Agency would permit ocean transportation and dumping only when both "will not unreasonably degrade or unreasonably endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities." H.R. 4723 § 5(a). The Administration has opposed a bill, S. 1082, 92d Cong., 1st Sess., which would ban all ocean dumping in five years, describing it as "unfeasible." 1 ER—CURR. DEV. 1473-74 (1971).

227. Other states are also concerned, e.g., North Sea Wastes are Worrying the Dutch, N.Y. Times, May 2, 1971, at 5, col. 1.

228. The community interest in the oceans and the appropriateness of inclusive decisions on their use is well described in M. MCDougal & W. Burke, supra note 211, at 1-88, 747-51 (1962). One could argue that the Canadian Arctic Waters Pollution Prevention Act (see articles by Bilder and by Henkin, supra note 46) and the broad nationally-controlled fishing zones that have recently been established (see note 246 infra) mark a partial collapse of this consensus. These restrictions, however, are of recent origin and are limited in substantive scope and geographical extent. It seems unlikely that the underlying concept of the oceans as a shared resource will be rejected across the board; instead international regulatory mechanisms for the oceans appear on the horizon.
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.\textsuperscript{229}

Since very little international regulation is currently in force, new agreements to assure the preservation of the ocean waters in a state sufficiently pure to avoid ecological disruption are now in the drafting stage. While the IMCO Convention for the Prevention of Pollution of the Sea by Oil has been widely ratified and recently improved by strengthening amendments, its primary aim is to prevent the pollution of beaches and coastal waters.\textsuperscript{230} The members of the North Atlantic Treaty Organization, acting through that Organization’s Committee on the Challenges of Modern Society, resolved in November 1970, “to achieve by mid-decade the elimination of international discharges of oil and oily wastes into the sea, and the minimization of accidental spills” by developing improved ship design, by ratifying the 1969 Amendments to the IMCO Convention on Oil Pollution, and by convening a special session of the IMCO Assembly in 1971 to begin drafting a treaty for adoption at the planned 1973 IMCO-sponsored International Conference on Marine Pollution.\textsuperscript{231}

International action on intentional ocean dumping appears to be not far off.\textsuperscript{232} President Nixon’s Environmental Message to Congress in February 1971, indicated that his Administration would “develop and pursue international initiatives” on this subject,\textsuperscript{233} and Senator Ernest Hollings, Chairman of the Senate Commerce Subcommittee on Oceans and Atmosphere, has introduced a Joint Resolution looking toward new international agreements to regulate ocean dumping.\textsuperscript{234}


\textsuperscript{230} See notes 126-130 and accompanying text supra.

\textsuperscript{231} See \textit{NATO Experts Recommend International Action on Ocean Oil Spills}, 63 \textit{Dep’t State Bull.} 665-69 (1970).

\textsuperscript{232} In pursuance of General Assembly Resolution 2414, the Secretary-General issued a Report on International Cooperation in Questions Relating to Oceans, U.N. Doc. E/4836 (May 12, 1970). One section deals with “[p]romotion of international agreement on the prevention and control of marine pollution,” and it gives a concise description of international activities in that field to date. \textit{Id.} at 8-13.

\textsuperscript{233} The President’s Message included the following language:

[Domestic legislation] would go far toward remedying this problem off our own shores. However, protection of the total marine environment from such pollution can only be assured if other nations adopt similar measures and enforce them.

—I am instructing the Secretary of State, in coordination with the Council on Environmental Quality, to develop and pursue initiatives directed toward this objective.

The Preparatory Committee for the 1972 United Nations Conference on Human Environment has established an Intergovernmental Working Group on Marine Pollution which is focusing on ocean dumping problems.\(^{235}\) The United States has submitted to the Working Group a Draft Convention on the Regulation of Ocean Dumping,\(^{236}\) which requires national licensing machinery for all dumping and prohibits the issuance of a permit if it

would unreasonably degrade or endanger human health, welfare or amenities, or the marine environment, ecological systems, or existing or future economic use of the ocean.\(^{237}\)

Each state must establish criteria for licensing dumping which consider, in addition to the limitations above,

the possible persistence or permanence of the effects of the proposed dumping, the volume and concentration of materials involved, the location proposed for the dumping, including impact on the public interest of the people of each Party.\(^{238}\)

The criteria must be submitted to an international Secretariat established by the Convention, and a General Conference is created to gather information and supervise the operation of the Convention.\(^{239}\) The adoption of a Convention on Ocean Dumping is expected to be a major product of the Human Environment Conference.

The doctrine of "freedom of the seas" was born out of disputes that were truly concerned not with access to the waters themselves, but to the living resources of the seas. With the development of modern fishing techniques and equipment, the danger of permanent depletion of this resource is quite real. In recent decades, there has been increasing recognition that supplies are not unlimited and that policies of maximum exploitation are a prescription for disaster.\(^{240}\) The shared character of this resource has generally been considered an inevitable consequence of the migration patterns of many species and the inability of any state to exercise effective control over them. Over the years many international agreements have been reached with respect to particular fisheries\(^{241}\) and particular species.\(^{242}\) A major step


\(^{236}\) 10 Int'l Legal Mats. 1021 (1971).

\(^{237}\) Id. at 1023 (draft convention, art. III(b). This language is almost congruent with that of the Nixon Administration's proposed Marine Protection Act of 1971, S. 1238, 92d Cong., 1st Sess.

\(^{238}\) 10 Int'l Legal Mats. 1024 (draft convention, art. III(c) ) (1971).

\(^{239}\) Id. at 1024 (art. III(c) ) and 1024-26 (art. IV).

\(^{240}\) A comprehensive and detailed treatment of these subjects can be found in D.M. Johnston, supra note 204.

\(^{241}\) See e.g., id. at 358-65.

\(^{242}\) See e.g., id. at 264-69 and 396-411.
forward was taken when the 1958 Geneva Conference on the Law of the Sea approved the Convention on Fishing and Conservation of the Living Resources of the High Seas, now ratified by thirty nations, which announces the general principle that

all States have the duty to adopt, or to co-operate with other States in adopting, such measures for their respective nationals as may be necessary for the conservation of the living resources of the high seas.244

The term "conservation of the living resources of the high seas" is defined to mean "measures rendering possible the optimum sustainable yield from those resources so as to secure a maximum supply of food and other marine products."245 The heart of the Convention is a series of provisions requiring negotiation of fisheries agreements at the option of any state fishing in a particular area, subject to Convention provisions protecting the rights of third parties. Unfortunately, many states have chosen not to proceed on the basis of this kind of cooperative approach, and have instead responded unilaterally to the increased demand in recent years for the products of the living resources of the oceans. Several states have asserted exclusive authority over large areas of the ocean adjacent to their coasts for purposes of conservation and efficient exploitation of the living resources in those areas.246 In addition to the economic impact of such policies on foreign fishing interests, it is questionable whether this kind of national regulation will be conducted so as to produce the optimum long-range result from an ecological or an economic standpoint. International regulation of the conservation of the living resources of the oceans is one of the matters on the agenda of the 1973 United Nations Conference on the Law of the Seas, but it remains to be seen whether any satisfactory solution can be agreed upon.247

244. Id., art. 1(2).
245. Id., art. 2.
246. See D.M. JOHNSTON, supra note 204, at 334-41 for a history of the 200-mile zone claims of Chile, Ecuador, Peru, Costa Rica and El Salvador, which date back to 1952. A current list of national territorial waters and related claims appears in 10 Int'l Legal Mats. 1255 (1971).
247. The United Nations General Assembly has scheduled a conference for 1973 to deal with the establishment of an equitable international regime—including an international machinery—for the area and the resources of the seabed and the ocean floor and the sub-soil thereof beyond the limits of national jurisdiction, a precise definition of the area, and a broad range of related issues including those concerning the regime of the high seas, the continental shelf, the territorial sea (including the question of its breadth and the question of international straits) and contiguous zone, fishing and conservation of the living resources of the high seas (including the question of the preferential rights of coastal states), the preservation of the marine en-
The crisis in the management of the living resources of the ocean has coincided with the appearance of a potential new shared resource: the seabed and subsoil. Recent studies indicate that the seabed contains vast mineral wealth, and new technologies are being developed to exploit it. Such technological developments present the danger, here as elsewhere, of upsetting the ecological fabric of the seabed and the ocean above.\textsuperscript{248} The "shared resource" nature of the sea floor has by now been fully established. The traditional view was that the seabed had the same legal status as the high seas themselves, but in the face of new technological possibilities for exploitation, states initiated claims to the seabed beyond the limits of territorial waters.\textsuperscript{249} This position was supported by commentators, who directed their attention to uses of the seabed adjacent to the coast.\textsuperscript{250}

The 1958 Geneva Convention on the Continental Shelf established an outer limit to state claims to the ocean floor\textsuperscript{251} and, while the ambiguities of this definition have proved a source of controversy, the Convention unequivocally supports the view that there is a vast area of seabed which is beyond the reach of national claims. The question of an appropriate regime for the seabed "beyond the limits of national jurisdiction" was placed before the United Nations in 1967, and from the earliest stages of its deliberations the deep seabed has been recognized as a shared resource.\textsuperscript{252} This principle was crystallized in the 1970 General Assembly Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction, which declares that this area is "the common heritage of mankind" and "shall not be subject to appropriation by any means by States or persons."\textsuperscript{253}

\begin{footnotesize}
\begin{enumerate}
\item Environment (including, \textit{inter alia}, the prevention of pollution) and scientific research.
\item A United Nations General Assembly Resolution which established an ad hoc committee on this subject noted in its preambular paragraphs both the potential wealth of the seabed and the dangers of detrimental human activities there. \textit{G.A. Res. 2340, 22 U.N. GAOR Supp. 16, at 14, U.N. Doc. A/6716 (1967).}
\item The first was the Truman Proclamation, 59 Stat. 885 (1945).
\item \textit{E.g.}, 1 L. Oppenheim, \textit{supra} note 26, at 628-35; Perry, \textit{The Function of Law in the International Community, in Manual of Public International Law} 46-47 (M. Sorensen ed. 1968).
\item For the purpose of these articles, the term "continental shelf" is used as referring (a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 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; (b) to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands.
\item 1. The sea-bed and ocean floor, and the subsoil thereof, beyond
\end{enumerate}
\end{footnotesize}
The need for regulation of environmentally damaging activities from exploitation of the seabed was recognized in the 1958 Geneva Convention on the Continental Shelf. It began the process by requiring national regulation of these activities on the continental shelves of the contracting parties. Specification of concrete international standards is under active consideration as part of the United Nations program to establish an international regime for the seabed. In 1968 the General Assembly requested the Secretary-General to undertake a study of these problems in connection with the elaboration of principles for future international agreements for the seabed area. The Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction included the following language:

11. With respect to activities in the area and acting in conformity with the international regime to be established, States shall take appropriate measures for and shall co-operate in the adoption and implementation of international rules, standards and procedures for, *inter alia*:

(a) The prevention of pollution and contamination, and other hazards to the marine environment, including the coastline, and of interference with the ecological balance of the marine environment;

(b) The protection and conservation of the natural resources of the area and the prevention of damage to the flora and fauna of the marine environment.

The discussion of concrete national proposals for the seabed is in fact well underway. The United States Working Paper of a Draft United
Nations Convention on The International Seabed Area submitted to the Seabed Committee in August, 1970, includes substantive articles on protection of the living resources of the seabed, protection of the marine environment, life and property, scientific research, and international marine parks and preserves, and authorizes the adoption of Rules and Recommended Practices for this purpose. Dur-

257. 9 Int'l Legal Mats. 1046 (1970).
258. B. Living Resources of the Seabed

ARTICLE 22

Subject to the provisions of Chapter III, each Contracting Party may explore and exploit the seabed living resources of the International Seabed Area in accordance with such conservation measures as are necessary to protect the living resources of the International Seabed Area and to maximize their growth and utilization.

Id. at 1052.

259. C. Protection of the Marine Environment, Life and Property

ARTICLE 23

1. In the International Seabed Area, the International Seabed Resource Authority shall prescribe Rules and Recommended Practices, in accordance with Chapter V of this Convention, to ensure:
   a. The protection of the marine environment against pollution arising from exploration and exploitation activities such as drilling, dredging, excavation, disposal of waste, construction and operation or maintenance of installations and pipelines and other devices;
   b. The prevention of injury to persons, property and marine resources arising from the aforementioned activities;
   c. The prevention of any unjustifiable interference with other activities in the marine environment arising from the aforementioned activities.

2. Deep drilling in the International Seabed Area shall be undertaken only in accordance with the provisions of this Convention.

Id.

260. D. Scientific Research

ARTICLE 24

1. Each Contracting Party agrees to encourage, and to obviate interference with, scientific research.

2. The Contracting Parties shall promote international cooperation in scientific research concerning the International Seabed Area:
   a. By participating in international programs and by encouraging cooperation in scientific research by personnel of different countries;
   b. Through effective publication of research programs and the results of research through international channels;
   c. By cooperation in measures to strengthen the research capabilities of developing countries, including the participation of their nationals in research programs.

Id. at 1052-53.

261. E. International Marine Parks and Preserves

ARTICLE 25

In consultation with the appropriate international organizations or agencies, the International Seabed Resource Authority may designate as international marine parks and preserves specific portions of the International Seabed Area that have unusual educational, scientific or recreational value. The establishment of such a park or preserve in the International Trusteeship Area shall require the approval of the appropriate Trustee Party.

Id. at 1053.

262. ARTICLE 68

1. Annexes shall be limited to the Rules and Recommended Practices necessary to:
ing 1971, somewhat less elaborate working papers were presented by Tanzania, the Soviet Union, a group of Latin-American states, and a group of primarily non-coastal States. Except for the latter paper, which is only a brief outline of a proposal, all provide for pro-

- Fix the level, basis, and accounting procedures for determining international fees and other forms of payment, within the ranges specified in Appendix A;
- Establish work requirements within the ranges specified in Appendices A and B;
- Establish criteria for defining the technical and financial competence of applicants for licenses;
- Assure that all exploration and exploitation activities, and all deep drilling, are conducted with strict and adequate safeguards for the protection of human life and safety and of the marine environment;
- Protect living marine organisms from damage arising from exploration and exploitation activities;
- Prevent or reduce to acceptable limits interference arising from exploration and exploitation activities with other uses and users of the marine environment;
- Assure safe design and construction of fixed exploration and exploitation installations and equipment;
- Facilitate search and rescue services, including assistance to aquanauts, and the reporting of accidents;
- Prevent unnecessary waste in the extraction of minerals from the seabed;
- Standardize the measurement of water depth and the definition of other natural features pertinent to the determination of the precise location of International Seabed Area boundaries;
- Prescribe the form in which Contracting Parties shall describe their boundaries and the kinds of information to be submitted in support of them;
- Encourage uniformity in seafloor mapping and charting;
- Facilitate the management of a part of the international trusteeship area pursuant to any agreement between a Trustee Party and the Authority under Article 29;
- Establish and prescribe conditions for the use of international marine parks and preserves.

Id. at 1065.

265. U.N. Doc. A/AC. 138/49 (Aug. 4, 1971), 10 Int'l Legal Mats. 1003 (1971). The states submitting this paper were Chile, Columbia, Ecuador, El Salvador, Guatemala, Guyana, Jamaica, Mexico, Panama, Peru, Trinidad and Tobago, Uruguay, and Venezuela.

266. U.N. Doc. A/AC. 138/55 (Aug. 19, 1971), 10 Int'l Legal Mats. 1011 (1971). The states submitting this paper were Afghanistan, Austria, Belgium, Hungary, Nepal, Netherlands and Singapore. This writer concludes that these states consider themselves primarily non-coastal States because of the following novel suggestion in their Working Paper:

Member States to be divided into two categories: Category A consists of primarily coastal States; Category B of primarily non-coastal States. Each member State shall indicate at the moment of ratification to which category it belongs. In any organ of the International Authority, in which not all States members are represented (such as the Council), there should be an equal number of representatives of Category A and of Category B. Within each category developing countries should be adequately represented.

Id.
tection of the marine environment and authorize an international agency to adopt rules for this end.267

The primary purpose of the 1973 United Nations Convention on the Law of the Sea is to adopt a convention that will deal with the allocation of this resource through the mechanism of a new international organization with authority over the seabed.268 Any such agreement is likely to contain substantial provisions on the environmental aspects of the subject.

B. The Earth's Atmosphere

Another shared resource which has recently become a matter of international concern is the envelope of atmosphere which surrounds the globe. The first great problem to come to public attention was the potential injury from injecting into the atmosphere vast quantities of radioactive material, particularly strontium-90—a highly dangerous substance with a very long lifespan. Intentional modification of global weather patterns, perhaps in some irreversible way, has been a concern for several years. Recently, questions have been raised about more subtle alterations in the composition of the atmosphere. Some commentators, anticipating the enormous growth of the population and economic activity and the high potential for the destruction of oxygen-producing ocean life discussed above, have predicted that man's end will come "not with a bang but a gasp," from the depletion of the oxygen supply in the atmosphere.269 Mr. Daniel Moynihan, then President Nixon's Advisor on Urban Affairs, raised the specter of a change in the composition of the atmosphere leading to an alteration in the temperature level of the earth, which in turn might precipitate a change in ocean levels or a new ice age.270 A cataclysmic rise in ocean levels might result from a projected twenty-five percent increase in the level of carbon dioxide in the atmosphere by the year 2000, raising the temperature of the earth by several degrees, leading to a massive melting of the polar icecaps. A new ice age might result from an increase in the amount of particulate matter in the atmosphere reflecting light away from the earth and cooling it by several degrees.

Some of these fears appear to be ill-founded. The human capability to alter global weather patterns purposefully is still quite spec-

267. Tanzanian Working Paper, supra note 263, arts. 16(12), 29(1)(d), and 29(1)(f); Soviet Working Paper, supra note 264, art. 18(2)(g); Latin American Working Paper, supra note 265, art. 14(f).
268. See note 247, supra.
270. Mr. Moynihan was speaking at the opening session of the NATO Committee on the Challenges of Modern Society. NATO LETTER, Jan. 1970, at 8.
ulative, although scientific investigations are underway and this field, like
others, is subject to the impact of a major breakthrough at any time. As for depletion of the oxygen supply, Professor Wallace Broecker of Columbia University has calculated that even if all photosynthetic activity were to cease,
the molecular oxygen supply in the atmosphere and in the broad expanse of open ocean are not threatened by man's activities in the foreseeable future. Molecular oxygen is one resource that is virtually unlimited.

An analysis of the effects of increases in carbon dioxide and particulates in the atmosphere conducted at the Goddard Space Flight Center indicates that

even an order of magnitude increase in CO$_2$ in the atmosphere by human activities, which at the present rate of input is not expected within the next several thousand years, may not be sufficient to produce a runaway greenhouse effect on Earth. On the short time scale, if CO$_2$ is augmented by another 10 percent in the next 30 years, the increase in the global temperature may be as small as 0.1° K.

On the other hand, the analysis indicated that the problem of particulates deserves serious consideration as the potential cause of a new ice age if not brought under control. It should be noted that virtually all of these threats to the atmosphere are based in large measure on multiple estimations and are typically surrounded by caveats to that effect. It is therefore quite possible that the danger is either substantially less or substantially greater than these analyses indicate.

International regulation of the uses of the atmosphere may be


[S]everal recent studies suggest that the global dust content of the atmosphere has been increasing during the last few decades, perhaps by as much as a factor of 2 in the last 60 years. . . . However, it is projected that man's potential to pollute will increase six-to eightfold in the next 50 years. If this increased rate of injection of particulate matter in the atmosphere should raise the present global background opacity by a factor of 4, our calculations suggest a decrease in global temperature by as much as 3.5° K. Such a large decrease in the average surface temperature of Earth, sustained over a period of few years, is believed sufficient to trigger an ice age.

*Id.* at 141.
appreciably hampered by the fact that the international community has not formally recognized its "shared resource" nature. The international law of the atmosphere began as the law of "air space," that is, the medium in which aircraft move. The legal principles were framed to meet the perceived need of states to control foreign overflight:

The practice of States seems to accord with the theory of the sovereignty of the subjacent State in the air space over its territory and waters, both national and territorial, unmitigated by any servitude or other right of innocent passage. Notwithstanding this doctrinal position, the world community has increasingly recognized the shared resource character of the atmosphere. The use of the atmosphere over the oceans has been incorporated into the shared use regime of the high seas, and the widespread acceptance of the Chicago Convention on International Civil Aviation has effectively established a right to overflight by civilian aircraft. Despite continuing efforts, attempts to assert territorial sovereignty against foreign use of the atmosphere for telecommunications purposes have met with little success. In light of these developments, it is perhaps

274. See Bishop, General Course of Public International Law, 1965, in 115 Recueil des Cours 147, 286 (1965). Convention on International Civil Aviation, opened for signature Dec. 7, 1944, 61 Stat. 1180, T.I.A.S. 1591, 15 U.N.T.S. 295, provides in art. 1 that, "(t)he Contracting states recognize that every State has complete and exclusive sovereignty over the airspace above its territory." See also 1 L. Oppenheim, supra note 26, at 516.

The basic rule for the status of airspace above land territory and the territorial sea is that it is an integral part of state territory and falls under the exclusive jurisdiction of the subjacent state. The regime of the airspace is determined by the laws and regulations of the subjacent state, which is completely free either to permit or forbid the overflight of foreign aircraft.


278. See Hondius, International Control of Broadcasting Programs in Western Europe, in The International Law of Communications 69 (E. McWhinney ed. 1971).
not surprising to find that the door to international regulation of the use of the atmosphere with respect to environmental concerns has not remained completely shut.

The problem of radioactive pollution of airspace was largely solved in 1963 through the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water, in which the Parties, "desiring to put an end to the contamination of man's environment by radioactive substances," among other aims, agreed to end nuclear tests in these media. Though tests in the atmosphere were prohibited, the apparent sovereign right of a State to pollute its "own" airspace was perpetuated in the provision which prohibits continued testing

(b) in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted. It is understood in this connection that the provisions of this subparagraph are without prejudice to the conclusion of a treaty resulting in the permanent banning of all nuclear test explosions, including all such explosions underground, the conclusion of which, as the Parties have stated in the Preamble to this Treaty, they seek to achieve.

In other words, a State may pollute the air above the territory within its boundaries if the explosion begins underground. To date, no subsequent agreement has been reached, although more than one underground test has injected radioactive debris into the air within the United States.

While there have been discussions in NATO, the Council of Europe, and the United Nations Economic Commission for Europe about the general problem of air pollution, there is no sign of steps toward any international agreements to regulate total emissions of air pollutants. It should be noted in this context that national action to alleviate specific air pollution problems will not necessarily correct imbalances among the constituents of the atmosphere. On the contrary, efforts to reduce the output of locally more toxic gases like carbon

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279. Both France and the Peoples Republic of China have continued with occasional nuclear weapons tests in the atmosphere, despite protests from other governments.
281. Id. art. I.1.(b) (emphasis added).
282. N.Y. Times, Jan. 10, 1969, at 14, col. 3; N.Y. Times, Nov. 1, 1969, at 26, col. 5; and see N.Y. Times, Apr. 13, 1969, at 66, col. 3, for a discussion of the legal and environmental problems of radiation leakage in connection with peaceful uses of nuclear explosives, including a suggestion that eventually such explosions will have to be rationed among states to avoid radiation damage.
283. See note 177 supra.
monoxide may result in an increased output of "harmless" gases like carbon dioxide.\textsuperscript{284} Similarly, aside from a few visionary calls for action to deal with the dangers of intentional global weather modification,\textsuperscript{285} the international community has so far largely neglected this matter. It may be hoped that the World Meteorological Organization will give sufficient thought to this problem to be able to meet the need when it arises.

\textbf{C. Outer Space Environment}

The threats to the outer space environment include some of those which threaten the airspace environment—pollution from nuclear explosions and contamination from the by-products of human activity there, such as dead satellites or other spacecraft debris.\textsuperscript{286} There are other dangers as well: degradation and contamination, biological or otherwise, of other celestial bodies (or of the earth by transfer from such bodies), alteration or interruption of electromagnetic phenomena such as the Van Allen radiation belts, and interference with astronomical studies of the universe.\textsuperscript{287}

Two examples of this type of problem are worth noting. The first was the United States Project West Ford, which involved the release of

350 million tiny hair-like copper filaments (called dipoles) weighing a total of about 75 pounds. After a few months, the dipoles were expected to form a narrow belt in space around the earth which could be used as a means of reflecting signals between large microwave transmitters and sensitive receivers.\textsuperscript{288}

The proposal aroused substantial controversy in the scientific community because radio astronomers feared that the belt would seriously interfere with their observations. The United States, on the basis of "in house" advice, concluded that there would be no such effect and performed the experiment on October 21, 1961. Perhaps fortunately, the dipoles did not coalesce into the belt as planned, so the danger

\begin{footnotesize}
\begin{itemize}
  \item \textsuperscript{284} The mechanism by which carbon monoxide will be controlled in automobile exhaust emissions is by further oxidization, turning the carbon monoxide into carbon dioxide.
  \item \textsuperscript{285} See note 271 \textit{supra}.
  \item \textsuperscript{286} While the physical litter of these objects is not a serious problem, they do have an adverse impact on radio communication. Zhukov, \textit{Tendencies and Prospects of the Development of Space Law: The Soviet Viewpoint}, in \textit{NEW FRONTIERS IN SPACE LAW} 72, 83-84 (E. McWhinney & M. Bradley eds. 1969). By 1968, there were over one thousand objects in orbit. \textit{NASA Release 67-301, Space Flight Record 1958-67} (1967).
  \item \textsuperscript{287} See generally M. McDougal, \textit{et al.}, \textit{LAW AND PUBLIC ORDER IN SPACE}, 534-36 (1963); Johnson, \textit{Pollution and Contamination in Space}, in \textit{LAW AND POLITICS IN SPACE} 37 (M. Cohen ed. 1964).
  \item \textsuperscript{288} Johnson, \textit{supra} note 287, at 46.
\end{itemize}
\end{footnotesize}
of interference was not tested. The results of the second experiment, Project Starfish, were less fortunate. Again, "practical" considerations supported the test:

Government researchers proposed that a nuclear weapon exploded at high altitude might inject additional atomic particles into the Van Allen belts and thereby seriously disrupt radio communication—a capability of some military importance. Outside scientists argued that this test might have persistent effects on the Van Allen belts and interfere with other scientific research. A government scientific advisory committee concluded that the effects would disappear in a few months at most, and the explosion was approved. Contrary to government predictions, the effects turned out to have a probable lifespan of over twenty years and several experimental satellites were damaged. These episodes dramatically illustrate the kinds of problems that can arise and their potential global impact.

Because concern with outer space problems, like the concern with the seabed, arose at a time when the United Nations was available to serve as a forum for discussion and negotiation, the legal regime governing this field reflects more clearly the shared community interest in the proper management of this resource, despite the contrary precedents of air law. From the earliest stages of its consideration of this subject, the General Assembly recognized this interest in the preambu-

289. Id. at 46-48.
291. Id. at 52; see McIlwain, The Radiation Belts, Natural and Artificial SCIENCE Oct. 18, 1963, at 355, for a technical description of the effects.
292. Although proposals of this kind [which lend themselves to political manipulation and propaganda because of their amorphous character] present serious problems, it seems to me that they cannot be met by the ostrich approach, ignoring the widespread demands for an expression of community policy that would reduce the risks of conflict and unilateral action in this new area of human activity. Whether one likes it or not, the United Nations is bound to be used as an instrument for expressing norms based on a consensus of diverse interests. . . . The fact that the General Assembly has not been granted competence to legislate (except on matters of internal organization) is not sufficient to divert the strong desire for an expression of international policy that would facilitate orderly and peaceful development. It is indeed of some significance that most of the world looks to the General Assembly as the one instrument which is available for this purpose, and that its resolution 1721, which was adopted unanimously, is now generally considered to be a statement of the basic legal precepts governing outer space. The fact that it is a resolution and not a treaty has not deprived it of legal effect.

lar language of its resolutions establishing ad hoc and permanent committees on the peaceful uses of outer space in 1958\textsuperscript{293} and 1959.\textsuperscript{294} These expressions of shared interest led eventually to the following provisions in the United Nations Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, approved by the General Assembly in December of 1963:

(1) The exploration and use of outer space shall be carried on for the benefit and in the interests of all mankind.

(3) Outer space and celestial bodies are not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

(9) States shall regard astronauts as envoys of mankind in outer space, and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of a foreign State or on the high seas. Astronauts who make such a landing shall be safely and promptly returned to the State of registry of their space vehicle.\textsuperscript{295}

While it was widely suggested that this Declaration as well as General Assembly Resolution 1884\textsuperscript{296} already constituted international law,\textsuperscript{297}

\begin{itemize}
  \item Recognizing the common interest of mankind in outer space and recognizing that it is the common aim that outer space should be used for peaceful purposes only . . . .
  
  \item Considering that an important contribution can be made by the establishment within the framework of the United Nations of an appropriate international body for co-operation in the study of outer space for peaceful purposes . . . .
\end{itemize}


\begin{itemize}
  \item Recognizing the common interest of mankind as a whole in furthering the peaceful use of outer space.
  
  Believing that the exploration and use of outer space should be only for the betterment of mankind and to the benefit of the States irrespective of the stage of their economic or scientific development.
  
  Desiring to avoid the extension of present national rivalries into this new field.
  
  Recognizing the great importance of international co-operation in the exploration and exploitation of outer space for peaceful purposes.
  
  Noting the continuing programmes of scientific co-operation in the exploitation of outer space being undertaken by the international scientific community,
  
  Believing also that the United Nations should promote international co-operation in the peaceful uses of outer space . . . .
\end{itemize}


See text accompanying note 302 infra.

the United States in 1965 initiated efforts to restate these principles in
treaty form, resulting in the conclusion in 1967 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.
In language similar to the Declaration, the Treaty reaffirmed that outer
space and celestial bodies shall be treated as a shared resource.

Concern for preserving the quality of this shared resource grew
with the realization of the potentialities of damage from human activi-
ties and the development of these legal principles of community in-
terest. As early as 1958 the non-governmental International Council
of Scientific Unions (ICSU) set up a Committee on Contamination by
Extraterrestrial Exploration (CETEX) to report on the problems of
contamination of both the earth and other celestial bodies from space
activities. The CETEX report was noted in 1959 by the General
Assembly's Ad Hoc Committee on the Peaceful Uses of Outer Space,
which encouraged further investigation of the subject. In 1961,
ICSU's Committee on Space Research (COSPAR) established a Con-
sultative Group on Potentially Harmful Effects of Space Experiments
with a mandate to examine "all questions relating to possibly harmful

Space: 'Instant' International Customary Law?, 5 INDIAN J. INT'L L. 23 (1965);
Schachter, supra note 292; Lachs, The Law-Making Process for Outer Space, in NEW
FRONTIERS IN SPACE LAW 13 (E. McWhinney & M. Bradley eds. 1969).

298. A concise description of the origins of the treaty can be found in Vlasic,
Vlasic also comments on the unfortunate effect of the negotiation of this treaty on the
status in legal theory of the General Assembly resolutions, id. at 519.

6347, 610 U.N.T.S. 205.

300. Article I

The exploration and use of outer space, including the moon and other
celestial bodies, shall be carried out for the benefit and in the interests of all
countries, irrespective of their degree of economic or scientific development,
and shall be the province of all mankind.

Outer space, including the moon and other celestial bodies, shall be free
for exploration and use by all States without discrimination of any kind, on a
basis of equality and in accordance with international law, and there shall be
free access to all areas of celestial bodies.

There shall be freedom of scientific investigation in outer space, in-
cluding the moon and other celestial bodies, and States shall facilitate and
encourage international co-operation in such investigation.

Article II

Outer space, including the moon and other celestial bodies, is not subject
to national appropriation by claim of sovereignty, by means of use or occupa-
tion or by any other means.

Treaty on Principles Governing the Activities of States in the Exploration and Use of
Outer Space, Including the Moon and Other Celestial Bodies, id. arts. I & II. A thor-
ough and technical discussion of the appropriate description and character of the legal
regime of outer space can be found in S. LAY & H. TAUBENFELD, THE LAW RELATING
to ACTIVITIES OF MAN IN SPACE 51-87 (1970).

301. This description of CETEX and COSPAR is based on Johnson, supra note
287, at 39-45.
effects of proposed space experiments" and to make recommendations, following more thorough study of potentially harmful experiments, to the COSPAR Executive Council. In 1963 the General Assembly adopted Resolution 1884, which welcomed the expression of intention by the United States and the Soviet Union to refrain from stationing in outer space "any objects carrying nuclear weapons or other kinds of weapons of mass destruction" and called upon all States to make further commitments along those lines. 302 The Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space contained a provision which called for consultations before a State undertook an activity or experiment which might cause "potentially harmful interference with activities of other States in the peaceful exploration and use of outer space." 303 This provision was expanded in Article 9 of the 1967 Outer Space Treaty to explicitly include "the moon and other celestial bodies" in the term "outer space." 304 More importantly, a sentence expressly creating a duty to avoid environmental degradation was added:

States Parties to the Treaty shall pursue studies of outer space, in-

302. The General Assembly,

. . . . Welcomes the expressions by the Union of Soviet Socialist Republics and the United States of America of their intention not to station in outer space any objects carrying nuclear weapons or other kinds of weapons of mass destruction;

(2) Solemnly calls upon all States:

a. To refrain from placing in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, installing such weapons on celestial bodies, or stationing such weapons in outer space in any other manner;

b. To refrain from causing, encouraging or in any way participating in the conduct of the foregoing activities.


303. (6) In the exploration and use of outer space, States shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space with due regard for the corresponding interests of other States. If a State has reason to believe that an outer space activity or experiment planned by it or its nationals would cause potentially harmful interference with activities of other States in the peaceful exploration and use of outer space, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State which has reason to believe that an outer space activity or experiment planned by another State would cause potentially harmful interference with activities in the peaceful exploration and use of outer space may request consultation concerning the activity or experiment.


cluding the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose.  

This provision has been described by one commentator who is rather critical of the Treaty as a whole as "of surpassing importance to the entire world community." It is noteworthy, however, that the consultation requirements which applied under the Declaration to activities considered "potentially harmful interference with activities of other States in the peaceful exploration and use of outer space" and which are carried forward in the Treaty do not apply to this provision. Nevertheless, the Treaty does establish the principle of responsibility for environmental damage to this resource. In an area filled with such factual uncertainties about the nature and extent of the dangers involved it may be premature to lay down any more precise substantive rules, but the establishment of an effective forum to consider claims based on actual or potential injury to the outer space environment is an obvious next step.

**D. The Earth's Stability**

Finally, one ultimate "shared resource" that may be in danger from present grandiose plans is the physical stability of the earth itself. It is apparently possible with present technology to produce effects which will alter the basic structure of the earth's crust. So far, states have not spoken of the earth's stability as a "shared resource," though it is difficult to conceive of it in any other terms. There have been several proposals to transfer into temperate or tropical zones, or artificially retain there, great quantities of water for human and industrial consumption. According to Dr. Raymond L. Nace of the United States Geological Survey, the cumulative effect of such projects could

305. *Id.* art. IX.  
307. Vlasic also points out that the consultation procedure is inadequate because it does not specify a forum or provide for authoritative third-party decision. *Id.* at 517-18.  
308. The element of State responsibility for breach of this principle is reinforced by the first sentence of art. VI:  

*States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.***

be to slow the rotation of the earth, resulting in an increase in planetary wobble with serious destructive impact.\textsuperscript{309} The first of such projects is already being planned by the Soviet Union, reversing the direction of the northward-flowing Irtysh and Tobol Rivers to bring their water to the southwestern areas of Uzbekistan and Termenistan by means of a combination of dams and canals constructed with over twenty nuclear explosives. The plan has been greeted with hostility by scientists from other states, but the Russians appear determined to continue.\textsuperscript{310} The United States has demonstrated greater discretion in its decision not to build a new inter-oceanic canal with nuclear explosives,\textsuperscript{311} but it has persisted with the underground testing of nuclear weapons in the Aleutian Islands.\textsuperscript{312}

As far back as 1967, C. Wilfred Jenks suggested international regulation of certain kinds of activities because of their potential dangers, in the form of

a Centre of the Earth Treaty formulating a code to govern experiments and deep drilling operations liable to affect geological processes and forces in the interior of the earth.\textsuperscript{313}

The very nature of these dangers suggests that massive alteration of the environment should be either forsworn completely or undertaken only after the widest possible publication and consultation with scientific authorities around the globe who may be knowledgeable on these problems. While substantive international regulation of the projects may have to await clearer recognition of the character of the dangers involved, it should be possible to establish immediately some publication and consultation procedures.

\textbf{E. Comments on the Regulation of Shared Resources}

Perhaps because of the absence of vested interests, those shared resources that have most recently become exposed to human alteration are the ones for which the prospects of effective international regulation are most promising. The regimes being developed through the United Nations for outer space and the seabed recognize the community interest in these resources and the desirability of shared access and benefits, and international consultation and regulation to protect the long-term global interest. Nevertheless, with these shared resources as with the others, much remains to be done before satisfactory international regulation can be said to exist. Environmental concerns have
been relatively marginal concerns in the design of these comprehensive regimes, and piecemeal treaties are no more desirable here than in the case of transnational environmental damage. Even though further investigation is necessary to clarify the extent of the threats posed by various uses and abuses of these resources, it is already appropriate to take steps to establish international machinery for publicity and advance consultation about potentially deleterious national activities and for the promulgation of both binding regulations and recommendatory standards on environmental matters. This institutional machinery should have jurisdiction over all of the shared resources, so as to permit coherent global policies. Should this arrangement prove impossible, organizational arrangements for each shared resource should be established, with carefully drawn and detailed provisions for coordination and resolution of policy differences.

IV

NATIONAL ENVIRONMENTAL REGULATION AFFECTING GLOBAL ECONOMIC ACTIVITIES

The third area in which international environmental regulation can be expected to develop is not direct environmental regulation at all but international regulation of national environmental standards. The need for this kind of regulation springs from the desires and concerns of international businessmen and government economic officials rather than from ecological needs per se. As a result this international regulation will focus particularly on national product standards in those areas where mass production and international trade predominate, but it may ultimately reach to all major aspects of national environmental regulation, and it may dilute national standards in those states which are acting most vigorously. Nevertheless, such regulation promises benefits in promoting global economic efficiency and insuring at least minimal environmental regulation everywhere. As might be expected in light of the newness of world concern about the environment, there is no existing international regulation of national environmental controls. The analysis that follows extrapolates from (1) the existing controls over national barriers to international trade in the General Agreement of Tariffs and Trade (GATT), 314 (2) the accepted rationales for the granting of special tariffs or other relief to endangered industries under existing United States law, 315 and (3) the inter-


315. An excellent survey appears in Davis, The Regulation and Control of For-
national standard-setting activities of the International Labour Organization (ILO). 316

A. Effect of Products Regulation

The area which is already of serious concern is the effect of environmental standards on mass-produced goods on international trade. One of the most positive developments in the post-war world is the negotiated reduction of tariff barriers on industrial products through the GATT, which has largely transformed the small national market for these goods into a single global market. 317 The size of this market has made possible economies of scale in the development, production, and distribution of many consumer products and even capital equipment which are a significant part of the increased standard of living in the Western nations. The imposition of national environmental standards threatens to break up this market by imposing an additional layer of obstacles to free international trade.

Of course national product health and safety regulations for various goods are not a new phenomenon, nor is their impact on international trade. Article XX of GATT, entitled "General Exceptions," has made special provision for such regulations, permitting those

(b) necessary to protect human, animal or plant life or health;

(f) imposed for the protection of national treasures of artistic, historic or archaeological value;

(g) relating to the conservation of exhaustible resources if such measures are made effective in conjunction with restrictions on domestic production or consumption; 318


317. See Watson, Trade: A Vision for the 70's, 8 Atlantic Community Q. 91 (1970).

318. Article XX

General Exceptions

Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable dis-
The current proliferation of restrictions based on these environmental concerns, however, appears to be turning these "exceptions" into the rule. There is hardly an import — whether it be jewelry that might be ornamented with products from endangered species, fish that might be contaminated by heavy metals, toys that might be physically or chemically dangerous, color television sets that might emit X-rays, or automobiles that might be unsafe — that has not been the subject of publicity and regulation in the United States in recent years. When protectionist pressures are strong, there is an incentive for states to establish differing standards which have the effect of keeping out foreign products; regulations which do not have real environmental significance would serve as protection for uncompetitive national producers.

While Article X of GATT requires that regulations restricting imports "shall be published promptly in such a manner as to enable governments and traders to become acquainted with them," and while in


320. See note 225 and accompanying text supra.

321. See 15 U.S.C. §§ 1261-74 (1971), Hazardous Substances, which prohibits interstate shipment "of any misbranded or banned hazardous substance," id. § 1263 (a), or importation of any such product [§ 1273(a)]. § 1261(f)(1)(D) defines "hazardous substance" to include:

(D) Any toy or other article intended for use by children which the Secretary [of Health, Education and Welfare] by regulation determines, in accordance with section 1262(e) of this title, presents an electrical, mechanical, or thermal hazard.


323. See the National Traffic and Motor Vehicle Safety Act of 1966, 15 U.S.C. §§ 1381-1426 (1970), which provides for the establishment by the Secretary of Transportation of "appropriate Federal motor vehicle safety standards," which "shall be practicable, shall meet the need for motor vehicle safety, and shall be stated in objective terms." Id. § 1392(a). It is unlawful to "manufacture for sale, offer for sale, or introduce or deliver for introduction in interstate commerce, or import into the United States" any non-complying vehicle or vehicle equipment. Id. § 1397(a)(1).


325. Article X

Publication and Administration of Trade Regulations

1. Laws, regulations, judicial decisions and administrative rulings of general application, made effective by any contracting party, pertaining to the classification or valuation of products for customs purposes, or rates of duty, or exports or charges, or to requirements, restrictions or prohibitions on
the case of many products adjustments to new regulations are easily made, such changes are difficult and sometimes impossible with respect to items which are very complicated or fundamentally flawed.

The current regulation of automobiles stands as the most serious case in point. The safety and pollution standards which have been enacted by Congress are sufficiently strict that the American manufacturers are protesting that they will be unable to comply with the statutory deadlines.\textsuperscript{326} These regulations are also applicable to automobiles offered for importation into the United States;\textsuperscript{327} very specific performance standards have been established for them.\textsuperscript{328} The effect of these regulations on the exports of foreign manufacturers to the United States is potentially devastating. While American manufacturers participate in the shaping of the American legislation and regulations through their lobbying activities and presumably began researching the necessary technology even before the legislation was formally approved, foreign manufacturers do not have those advantages. Furthermore, national manufacturers have been permitted, either formally or informally, to cooperate in the development of the necessary technology,\textsuperscript{329} while foreign manufacturers were not until recently given the benefit of such cooperation.

All of these problems are further complicated by the fact that other nations are developing their own standards for automobile safety and pollution control. Such standards may be more or less strict than the American standards, or they may simply be different. The 1975 and 1976 United States standards for the emission of various exhaust

\textsuperscript{326} N.Y. Times, Jan. 27, 1971, at 74, col. 1 (General Motors is lagging in its effort to meet safety and clean air standards).
\textsuperscript{329} For documents and discussion about the antitrust aspects of cooperative development of pollution control devices by the American automobile industry, see L. JAFFEE & L. TRIBE, ENVIRONMENTAL PROTECTION 140-80 (1971).
gases are calculated on the basis of a percentage of the emissions of American vehicles under the 1970 and 1971 regulations,\textsuperscript{330} which in turn were based on administrative judgment “giving appropriate consideration to technological feasibility and economic costs”\textsuperscript{331} at the time earlier regulations were adopted. There is no scientific or technical reason to expect that the regulations enacted by other states would allow the same proportions of the various compounds. A single automotive design that would comply with the standards of all or several major states might be either technically impossible or economically unmarketable. The impact of separate production lines would inhibit the economies of scale that flow from a world market. The problem would be particularly great for those manufacturers in Japan and Western Europe that have for several years expanded their production through exports, which now account for a significant percentage of their sales.\textsuperscript{332} It is this kind of situation which has led the Managing Director of British Leyland Motor Corporation to call for

international standards governing automotive safety, noise, and exhaust emissions. . . . It was his contention that formation of . . . an international automotive study group was overdue. He declared that “there is already a danger that safety and pollution regulations applied indiscriminately by various countries can become perhaps discriminatory in their application.”\textsuperscript{333}

The very real difficulties that grow out of differing state regulations on particular aspects of automobile design also tend to foster a suspicion that some foreign regulations have been developed either with complete disregard for their inhibiting effects upon international trade or with the covert intention to discourage international trade. Restrictions which inherently have the effect of preventing importation of competing products are not extraordinary.\textsuperscript{334}

\begin{flushleft}
\textsuperscript{330} 42 U.S.C. § 1857f-1(b) (1971).
\textsuperscript{331}  Act of October 20, 1965, Pub. L. No. 89-272, § 101, 79 Stat. 992:
\textsuperscript{332}  Sec. 202. (a) The Secretary shall by regulation, giving appropriate consideration to technological feasibility and economic costs, prescribe as soon as practicable standards, applicable to the emission of any kind of substance, from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause or contribute to, or are likely to cause or to contribute to, air pollution which endangers the health or welfare of any persons, . . .
\textsuperscript{334}  In 1969, total passenger car production in Germany, Japan, France, United Kingdom, and Italy amounted to 11.2 million vehicles. \textit{United Nations Statistical Yearbook} 320 (1970); in that same year the United States alone imported 1.85 million passenger cars, or about sixteen percent of that production. \textit{U.S. Bureau of the Census, Dept of Commerce, Statistical Abstract of the United States} 536 (1971).
\end{flushleft}

\textsuperscript{333} N.Y. Times, Apr. 11, 1970, at 61, col. 3.
\textsuperscript{334} See Mathews, \textit{supra} note 324, at 1310-11, 1319-21, 1325-26, which mentions luxury and other internal taxes, patent restrictions, and marks of origin requirements,
sophisticated—and frequently changed—design requirements are imposed by a major importing nation like the United States, the suspicion of protectionism is difficult to allay. In an effort to minimize foreign hostility to the American safety regulations, the United States government has persuaded the American automobile manufacturers to share their research results with foreign manufacturers. The United States government is financing the construction of a prototype 4000-pound “safety vehicle,” which will protect all of the occupants from serious injury in any crash up to 50 miles per hour. It is encouraging European manufacturers to pursue a similar project for a prototype 2000-pound “safety vehicle,” with the understanding that the results of these two efforts would be exchanged. In addition, certain information was disseminated by American manufacturers to aid foreign producers in complying with certain safety standards which are scheduled to come into effect in 1972.335

Similar problems have arisen with respect to pollution control equipment on aircraft. After a number of suits were filed against domestic airlines to prevent pollution in the vicinity of major airports,336 the State of New York sued eleven foreign airlines, charging them with violations of the New York pollution laws and asking that each be ordered to install such devices and mechanisms and to make such modifications to its engines on its aircraft arriving or departing from J.F.K. in order that noxious fumes, gases and smoke will not be discharged and emitted into the open air from its aircraft.337

American operators had already agreed with the Department of Health, Education and Welfare to equip their planes with emission controls,338 and twenty foreign air carriers were “requested” by H.E.W. to “join” in this program.339 But these events illustrate the potential

in addition to health, safety, and morals restrictions. For a detailed discussion of a specific United States tax which was alleged to be discriminatory, see Bercut-Vander voort & Co. v. United States, 46 C.C.P.A. 28 (1958), cert. denied, 359 U.S. 953 (1959), and the related materials collected in L. EBB, REGULATION AND PROTECTION OF INTERNATIONAL BUSINESS 742-57 (1964).

335. Presidential counselor Daniel Moynihan was largely responsible for the venture, which was arranged through the program of the NATO Committee on the Challenges of Modern Society. N.Y. Times, Apr. 17, at 7, col. 1. See also N.Y. Times, May 5, 1970, at 90, col. 1 (American auto manufacturers to demonstrate gas safety bag at auto meeting).

336. N.Y. Times, Jan. 29, 1970, at 74, col. 1 (stating that Illinois and New Jersey, as well as New York, had begun litigation to hasten control of jet aircraft pollution).


339. Letter from S. David Shearer, Ph.D., Bureau of Abatement and Control, Environmental Health Service, Department of Health, Education and Welfare, to the author, May 13, 1970, on file at the University of Toledo College of Law Library;
impact on both the routes flown by various airlines and the market for new aircraft of a series of differing national regulations on this subject. While planes can sometimes be juggled so as to fly routes where their exhausts will not create illegal levels of smoke, and while aircraft can sometimes be rebuilt to decrease the output of emissions, one likely effect would be some narrowing of the number of operators along with various international routes and the number of competing producers of international aircraft. A tangible sign of the potential effect of conflicting environmental regulation on the aircraft industry appeared in the efforts of representatives of the British manufacturers of the Concorde to prevent the passage of New York State legislation effectively excluding supersonic transports from its airports. They recognized that if the United States closed its airports to SST’s, a major market for the plane would collapse, and the economic viability of producing the Concorde would be doomed. Similar legislation has been proposed at the Federal level in the United States and in other nations as well. If varying noise standards are enacted in other nations, the problems for designers of both supersonic and subsonic commercial aircraft may be serious. The International Civil

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copy on file with Ecology Law Quarterly, Boalt Hall School of Law. It is reproduced here in pertinent part:

With regard to your question on foreign airlines, I can provide the following:

On March 3, 1970, Mr. J. W. Shaffer, Administrator of the FAA, sent a letter to 20 foreign air carriers which serve the United States, informing them of the agreement with the U.S. airlines and requested that they join the U.S. operators in this retrofit program. It is my personal opinion that they too will comply. This will, of course, not only reduce the smoke problem in this country but foreign countries as well.


341. Bills to prohibit the flight of supersonic transport planes over the United States—either permanently or pending further study of their effects—have been introduced in the 92d Congress, 1st Session, by Senator Nelson (S. 193, S. 1881), Senators Bayh and Church (S. 2555), Congressman Dingell (H. 5448), and Congressman Wolff (H. 8521). In addition Senator Nelson has introduced a Senate Concurrent Resolution calling for a study of the problem by the United Nations (S.C.R. 2). No action had been taken on any of these proposals as of March, 1972. However, the United States Senate has approved S. 1117, which would exclude overland flights of supersonic transport planes through the device of prohibiting sonic booms. This bill is still pending in the House of Representatives.

With respect to foreign regulation:

Five European governments—those of Sweden, Switzerland, West Germany, the Netherlands, and Norway—said at [a sonic boom] conference that they intended to ban overflights of supersonic commercial transports. The United States Government has already announced that it would ban such flights over populated areas.

Aviation Organization has devoted some attention to the issues of sonic boom and airport noise, but it has not yet formally addressed itself to national regulation of aircraft exhaust. Here, as in the case of automobiles, the need for international supervision of national environmental regulation is important if the economic impact of adequate regulation is to be minimized. Additional examples are not necessary to demonstrate the importance of some kind of international regulation to avoid Balkanization of the global market for manufactured goods. The alternative is to increase the cost and reduce the range of selection for all regulated products because of the barriers to foreign goods which would result.

B. Effect of Regulation of Production Activities

Beyond the problem of national product standards which inhibit international trade, there are many businessmen who believe that for business reasons international environmental standards should be set across the board. Environmental regulation of production activities increases the firm's costs of production either by requiring capital investment which does not add to output or by imposing "effluent charges" for the use of the air or water. While businessmen are always concerned about increases in the cost of producing their product, increases in costs of production which change the firm's position in relation to its competitors, whether foreign or domestic, pose the real threat to their position. If different jurisdictions impose different environmental standards upon manufacturing processes, the competitive position of the firms located in those jurisdictions will be altered.


nessmen who foresee that their states will impose relatively stringent regulations fear that the resulting cost differentials will adversely affect their firms' market positions or drive them out of business altogether. Thus, for example, steel produced in a state that permits unlimited abuse of the air and water can be sold at a price which cannot be matched by the producer in a state which imposes stringent standards. The danger of such a situation arising is compounded by the fact that there is an incentive for a state that relies upon international trade to condone or even encourage non-regulation as a means of making its product more competitive on the international market. Government officials who are concerned about their nation's balance of payments know that if they delay environmental controls while other states are applying them, the national balance of payments position will be improved and economic growth can accelerate. So the fears of the businessman are enhanced by the recognition that some foreign governments will pursue nationalistic, anti-environmental economic and regulatory policies to spur economic "progress."

C. Alternative Methods of International Regulation

There are basically two ways of trying to cope with the problems of inconsistent environmental standards for products and differing levels of environmental controls over productive activities: uniform international standards and countervailing duties. The adoption of uniform international standards would eliminate conflicting or inconsistent product standards and would place all manufacturers under the same set of regulations for their production activities. It would protect the environment in states that otherwise might not adopt any regulations or might adopt regulations which would be less effective than those agreed upon at the international level. Furthermore, the sharing of information and experience that would take place in the process of drafting the standards might lead to better standards. Even states that on the whole have the most stringent national standards would be benefitted

345. [A]s concern for the environment becomes a popular issue in more and more countries, many of those countries are taking steps to crack down on the polluters that operate within their borders. To companies engaged in international trade, the prospect of such country-by-country crackdowns is far more fearsome than the possibility of some sort of international regulation of pollution. Businessmen fear that a lack of coordination among national regulations could lead to a sort of "flags of convenience" situation in which certain countries would offer lax pollution controls as a lure to industry, much as maritime companies are now given tax advantages in flags-of-convenience nations like Liberia and Panama. The result could be a severe competitive disadvantage for those companies that operated in the stricter nations. . . .


to the extent that the international standards fill in gaps resulting from idiosyncracies in particular national legislative and administrative processes.

The closest existing model for this approach is the standard-setting process of the International Labour Organization (ILO), which in fifty years has adopted 130 International Conventions and over 130 Recommendations on such matters as wage and hour standards, working conditions, treatment of women and children employees, and fringe benefits.\textsuperscript{347} The articulated goal of these standards is to improve minimum levels for the benefit of the workers rather than to impose uniformity in the interest of equalizing competition among enterprises, but they have that effect as well to some degree.

To pitch the Conventions at the right level of stringency, the ILO begins by surveying the members to get accurate information on existing national standards, from which international standards can be projected.\textsuperscript{348} To provide flexibility and avoid rapid obsolescence, "certain conventions give States ratifying them an option between obligations of varying strictness or the right to accept only some Parts or to take advantage of temporary exceptions."\textsuperscript{349} Often Conventions are drafted in general language and supplemented by Recommendations which set forth in greater detail the desired content of the national standards. Two techniques have been used to implement these standards agreements. The more traditional approach is to require reports from states parties to the various Conventions and to have a committee of the ILO examine the reports and comment upon the performance of

\textsuperscript{347} Valticos, Fifty Years of Standard-Setting Activities by the International Labour Organization, 100 INT'L LABOUR REV. 201 (1969); see note 316 supra.

\textsuperscript{348} There are two extremes here to be avoided: on the one hand, if the aim is to set a standard which can be accepted at once by the greatest number of countries, the search for a kind of common denominator is apt to result in a standard that is too low to bring about progress on a significant scale; but on the other, to aim too high is liable to result in standards that are not immediately practicable for most countries. International labour standards are not, it has sometimes been said, a blueprint for Utopia but must be related to time and place. While for certain questions involving fundamental human rights the purpose is to safeguard their rights rather than to create an instrument reflecting actual practice in most countries, the usual aim in each instrument is to strike a balance—often a difficult one—"between the ideal and average existing practice."

It is in order to achieve this balance that the drafting of Conventions and Recommendations is preceded by a survey of the law and practice of member countries, consultations with governments and discussions at two consecutive sessions within tripartite committees of the Conference.

Valticos, supra note 347, at 216 (footnote omitted). The contradictions and compromises suggested by this description are an indication of the difficulties which can be expected in drafting international environmental standards. Over the years, twenty-five of the 130 Conventions adopted were made necessary because earlier agreements became obsolete or were flawed in their original form.

\textsuperscript{349} Id. at 217.
states in relation to the provisions of the treaty. More recently the ILO has played an "operational" role, providing technical assistance to governments in developing national programs to protect and benefit workers.

While the long experience of the ILO should prove a very useful guide to states proposing international standards for national environmental regulation, the difficulties with this approach in this field appear even more formidable than those faced by the ILO. It is not clear at this point whether many states would be willing to bind themselves by treaty to international standards if they actually impose serious limitations. On the other hand, if the uniform standards are not stringent, states with pre-existing high standards may prefer unilateral remedies instead of "tying their hands" in an international arrangement with lower standards. The acceptability of international standards will be further strained by the need for their frequent re-evaluation in the light of new scientific and technological developments, as the recent vacillation over the use of phosphate detergents has demonstrated. The cumbersomeness of the processes of international negotiation of new standards makes it quite possible that they will be in a constant state of flux. They may also be challenged outright on the basis of real or feigned breakthroughs which make them obsolete.

Furthermore, internationally established standards are of little use unless they are widely adopted, and in light of the international trade advantages that accrue to states with lower standards, the incentive to either overtly or covertly refuse to apply the uniform standards will be quite substantial. If a few major economic powers refuse to participate they will have an advantage of lower costs for their products as compared with their competitors, with resulting benefits for their balance of payments and international economic strength which

350. The effect of the officials' announcement was to stir confusion in Congress, where moves were afoot to legislate against phosphates, as well as in those states and municipal governments that have passed laws limiting phosphate detergents. . . .

Even President Nixon tried to persuade the major detergent makers to find a substitute for the phosphates that cause the fouling of lakes and streams.

In this period, four states including New York and Connecticut, as well as three major cities and the Canadian Government, have acted to limit the use of detergents containing phosphates.

N.Y. Times, Sept. 16, 1971, at 1, col. 2 (emphasis added). And see N.Y. Times, Sept. 17, 1971, at 20, col. 1 (Jerome Kretchmer, New York City Environmental Protection Administrator, charged that the change of federal policy was a mistake).

351. This analysis reflects the "collective goods" theory developed in M. Olson, Jr., The Logic of Collective Action (1965), and applied to environmental problems in B. Russett & J. Sullivan, Collective Goods and International Organization 102-04 (U. Mo.-St. Louis Center for International Studies, Monograph No. 3, E. Fedder ed. 1971).
will be unacceptable to other states. In such a context any agreement is likely to be short-lived. For the same reasons, there will be a significant likelihood of cheating by some states that do proclaim their adherence to the international minimum standards. The economic advantage is greatest when the exporter is the only one whose environmental standards are low, so covert violation is the most profitable approach. Given the difficulties of enforcement of environmental standards in any case, and the many slips between legislated standards and actual conduct, the ability of other states to detect cheating is low and the opportunities for lax enforcement are correspondingly high. In short, only a high level of global concern about environmental injury and its economic impact will be able to produce widespread international agreement on and enforcement of such standards.

The countervailing duties approach would impose additional tariffs upon the products of those states that do not regulate production activities to preserve environmental quality. This device is useful only in relation to the second problem; it does not discourage the establishment of environmentally-based barriers to international trade. These tariffs would be imposed unilaterally either in the absence of or in accordance with the terms of an international agreement permitting such imposts. They could be used as an enforcement mechanism for uniform international production standards. The appropriateness of the application of countervailing duties is apparent once one recognizes that the unrestricted use of the air and water is functionally similar to a subsidy for industry. Subsidies for export industries have long been seen as an appropriate basis for imposing import surcharges to offset the price advantages that result.

The GATT, while it calls for the abolition of export subsidies by the contracting parties as soon as possible, permits the imposition of countervailing duties to offset subsidies if the level of imports is such as to cause or threaten material injury to an established domestic industry, or is such as to retard materially the establishment of a domestic industry. Such duties may also be imposed with the approval of the GATT by a

352. This gap and the use of the courts to bridge it are the focus of J. SAX, *Defending the Environment* (1970).
state which is not protecting a domestic industry in order to protect the industry of other states which export to the state imposing the duty. 357 Although free use of the air and water and failure to pay other “environmental” costs could be thought of as a “bounty or subsidy,” the authors of the GATT apparently intended a much narrower definition. The GATT Contracting Parties have never been able to reach agreement on the precise scope of the terms, 358 but the European Free Trade Association (EFTA) has adopted a definitive official list originally drafted by the Organization for Economic Cooperation and Development (OECD). 359 It includes only direct subsidies, tax rebates, government price discounts, and currency control devices. The United States, whose countervailing duty act uses undefined terms similar to those in the GATT, has imposed such duties only in response to foreign export subsidies—as opposed to production subsidies—360 even though the Supreme Court has indicated that both are comprehended by the statutory language. 361

Even if the existing law could be interpreted or modified to cover the absence of environmental regulation, there are some important difficulties with the application of the countervailing duties approach. First, the imposition of a countervailing duty can only alter the selling price of imports in the state imposing it; a state whose domestic industry does not produce the imported product has little incentive to impose a tariff to protect the industry of a third state that has more stringent environmental regulations. While the GATT allows such tariffs in appropriate circumstances, as indicated above, the initiative must come from the importing state and receive the approval of the GATT parties. Second, unlike the typical export subsidy situation, it is very difficult to calculate accurately the extent to which differences in prices are the result of inadequate environmental regulation as opposed to other cost advantages such as cheaper raw materials, labor, production and sales techniques, financing, etc. Serious differences of opinion in a particular case are likely to lead to charges that the “countervailing duty” overshoots the mark and to retaliation by the exporting state. This danger will be heightened by the third factor: if inadequate environmental controls are the source of a state’s cost ad-

357. Id., art. VI, ¶ 6(b).
vantage, countervailing duties would be appropriate in some degree for *all* of the products exported by that state. Such across-the-board restrictions against the products of a single exporting state would inevitably be seen as malicious discrimination deserving retaliation. Only once has the United States imposed countervailing duties against a substantial portion of the imports from a single nation—Germany in 1939—and the circumstances in that case hardly set a precedent of objectivity.\(^3\)\(^6\)\(^2\) If used frequently, such duties would mark the end of the most-favored-nation system of tariffs which has been so crucial in the GATT system.\(^3\)\(^8\)\(^3\) Nevertheless, in the absence of agreement on international standards, it may not be surprising to see a major importing nation that faces serious balance of payments problems as a result of massive imports from a single nation resorting to this justification for a surcharge on those imports.\(^3\)\(^8\)\(^4\)

In addition to the problems inherent in both the international standards and the countervailing duties approaches, there is one overriding factor that will weaken the pressure for adoption if it is fully understood: neither of these devices will put businessmen on a completely equal footing in terms of costs of production. Non-industrialized, clean-environment areas will still have a cost advantage under

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362. The most significant use of the countervailing duty by the United States, either as a protective measure or as a policy instrument, occurred prior to the Second World War and involved imports from Germany. Fifteen percent of all German exports to the United States were subjected to countervailing duties in 1939 because they were held to have benefited from export subsidies. German goods upon which these duties were imposed amounted at that time to almost twenty-five percent of all dutiable imports into the United States. Countervailing duties became policy instruments subsequent to the German invasion of Czechoslovakia, when the United States subjected all dutiable merchandise imported directly or indirectly from Germany to a duty of twenty-five percent *ad valorem* on this merchandise. This deposit was refunded in full if the importer later proved his shipment had not been subsidized.


364. Washington—The Treasury Department announced today the imposition of "anti-pollution" penalty duties on imports of chemical products from Sludeland.

*A Treasury official said that the extra duties were designed to offset the lower production costs in Sludeland made possible by the lack of pollution controls in that country.* . . .

This entirely hypothetical news item conceivably could appear some time in 1977, or thereabouts. It could be a consequence of the establishment, in the next few years, of an international code for pollution standards.

Or—more likely—it could be a result of the industrial countries' failure to reach such an agreement.

The need for an agreement that would prevent pollution-control costs in one country from becoming a competitive disadvantage in trade with other countries has become a major concern lately of multinational business leaders.

any set of uniform standards or countervailing duties, because manufacturing plants located in heavily polluted urban areas will have to make a greater investment in pollution control equipment to reach the same levels of either effluent purity or air quality than will plants that begin their manufacturing processes in truly clean environments. Uniform environmental standards do not have the same impact as uniform wage levels, for example, which equalize the costs of labor for all producers with respect to that "resource." Rather, they simply put manufacturers in equally polluted environments on the same footing. In particular, manufacturers in less developed areas will still have an advantage after international minimum standards are adopted.

The fact that these cost differentials will continue to exist reflects the real differences in the availability of the natural assimilative capacity of the environment. But it is not clear from their statements that businessmen or government officials yet realize the limited effectiveness of uniform standards from the point of view of preserving the market position of firms in highly polluted areas as against "clean" areas. When they do discover this reality, they may conclude that the benefits of establishing international minimum environmental standards are not worth the cost of the complex and difficult international diplomacy which will be required to establish them. Business firms in various states already have a variety of uncompensated-for advantages, such as differing natural resource costs, transportation costs, and interest rates. These variations are accepted as legitimate economic factors that produce a more efficient allocation of resources, and the introduction of one more cost differential may not seem catastrophic. These differentials are particularly acceptable to modern multinational corporations that profit by utilizing the varying opportunities presented by different jurisdictions. Even without international standards, domestic pressure for a healthy environment is likely to produce some environmental regulation in every state of economic significance, so in the long run the standards in developed states may not vary dramatically in any case. Of course, uniform international environmental standards are theoretically preferable, because they produce the optimum global allocation of resources, and in the absence of such standards national governments will more frequently succumb to the temptation to abuse the environment for short-term economic advantage. It remains to be seen, however, whether the global sense of com-

365. See note 345 supra.
munity is strong enough to overcome the incentives to pursue national economic pre-eminence and wealth at the expense of the global environment. The recent collapse of international arrangements in the field of international economic and monetary affairs gives scant ground for hope that community-oriented policies will prevail in the near future.

CONCLUSION

Predictably, international regulation of environmental problems has focused primarily on those areas in which tangible economic interests are threatened: activities which actually caused transnational injury to economically valuable property and the exploitation of the shared living resources of the oceans. Beyond these cases, the United Nations has played a role in awakening the international community to the need for environmental regulation in the use of outer space and the seabed, although concrete agreements on these subjects are still in the embryonic stages. Nevertheless, a systematic survey of the kinds of international regulation which are needed to cope effectively with the environmental problems that presently plague the globe reveals that far more needs to be done. Even with respect to transnational environmental damage to specific property interests, the existing law is quite underdeveloped; and the law governing the use of shared resources shows almost no coherent conception of the fundamental similarity of the several areas being regulated. International control over national environmental regulation is still in the earliest talking stages without even a clear consensus that anything needs to be done.

A disturbing element that runs through the whole range of existing international agreements on environmental problems is the tendency of governments to take the narrowest possible focus in considering these problems. Dozens of agreements are ratified, pending, or proposed, applying marginally different rules to essentially similar situations and leaving great gaps where no regulation exists at all. It is to be hoped that as international discussion of the problems of the human environment progresses, the essential similarities and unities will become apparent, and governments will be able, by consolidating broad areas of environment regulation into a single general framework, to progress with the speed so urgently needed to impose some comprehensive rules upon the patchwork of existing law.