

Michigan Law Review

Volume 70 | Issue 3

1972

Controlling Great Lakes Pollution: A Study in United States-Canadian Environmental Cooperation

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CONTROLLING GREAT LAKES POLLUTION: A STUDY IN UNITED STATES-CANADIAN ENVIRONMENTAL COOPERATION

*Richard B. Bilder**

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ON June 10, 1971, the United States and Canada issued a Joint Communique announcing their intention to conclude a broad-ranging agreement designed to protect and enhance water quality in the Great Lakes and to bring the problem of Great Lakes pollu-

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This Article is based upon a paper presented at the Conference on Legal and Institutional Responses to Problems of the Global Environment sponsored by the American Society of International Law and the Carnegie Endowment for International Peace and held at Arden House, Harriman, N.Y., Sept. 25-Oct. 1, 1971. The various papers presented at this Conference, together with a report and analysis of the discussion, will be published by the sponsors during the spring of 1972 in a volume edited by J. Hargrove, *LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT*.

I would like to express my appreciation to the University of Wisconsin Sea Grant Program, which has facilitated my study of international environmental problems.

tion under substantial control by 1975.¹ The proposed Great Lakes Water Quality Agreement would establish common water quality objectives, commit the two governments to the development of compatible national water quality standards to meet those objectives, and provide for carrying out a wide variety of joint and separate pollution control programs and related measures. A major role in overseeing the joint program would be assigned to the International Joint Commission of the United States and Canada (IJC), which is a bilateral international commission created by the Boundary Waters Treaty with Great Britain of 1909 (1909 Treaty).² In announcing the two governments' "agreement to agree," Mitchell W. Sharp, Canada's Secretary of State for External Affairs, noted that the proposed Agreement would be the "most far-reaching ever signed by two countries in the environmental field."³ Russell E. Train, Chairman of the United States Council on Environmental Quality, described the proposed agreement as "an historic first" and added that its provisions will be "unprecedented in scope" and provide a model for similar international agreements in other parts of the world.⁴

The proposed Agreement would have obvious importance for United States-Canadian relations and the efforts of the two governments to deal with the increasingly urgent problems of Great Lakes pollution. But, as the Ministers' statements suggest, it might also have broader significance. The announcement by the two governments comes at a time of emerging global concern with environmental issues and possible international approaches to their solution⁵

1. U.S.-Canadian Joint Communique issued by the Joint U.S.-Canada Ministerial Meeting on Great Lakes Pollution, Washington, D.C., June 10, 1971, Dept. State Press Release No. 129, published in 64 DEPT. STATE BULL. 828 (1971) [hereinafter Joint Communique]. See N.Y. Times, June 15, 1971, at 85, col. 7. The Joint Communique indicated the two governments' intention to conclude the agreement before the end of 1971. The negotiations, however, have been delayed and the agreement will probably not be completed and signed until possibly the spring of 1972. (Information supplied by U.S. Dept. of State.)

2. Treaty with Great Britain Relating to Boundary Waters, and Questions Arising Between the United States and Canada, Jan. 11, 1909, 36 Stat. 2448 (1910), T.S. No. 548 (effective May 13, 1910) [hereinafter 1909 Treaty], art. VII.

3. N.Y. Times, June 11, 1971, at 11, col. 1.

4. *Id.*

5. The recent literature in this area is vast. See, e.g., B. COMMONER, *THE CLOSING CIRCLE: NATURE, MAN AND TECHNOLOGY* (1971); R. FALK, *THIS ENDANGERED PLANET* (1971); *MAN'S IMPACT ON THE GLOBAL ENVIRONMENT, REPORT OF THE STUDY OF CRITICAL ENVIRONMENTAL PROBLEMS* (C. Wilson ed. 1970); Ritchie-Calder, *Mortgaging the Old Homestead*, 48 FOREIGN AFFAIRS 207 (1970); Wolman, *Pollution as an International Issue*, 47 FOREIGN AFFAIRS 164 (1968). Particularly relevant here are the various papers in *LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT* (J. Hargrove ed. 1972); Schachter & Serwer, *Marine Pollution Problems and Remedies*, 65 AM. J. INTL. L. 84 (1971); *Symposium, The International Legal Aspects of Pollution*, 21 U. TORONTO L.J. 173 (1971).

—a concern symbolized in the forthcoming United Nations Conference on the Human Environment, which will convene in Stockholm in June 1972.⁶ The Stockholm Conference will have the tasks of focusing the attention of governments and the public on the importance and urgency of problems of the human environment and of identifying those aspects of environmental and pollution problems appropriate for international cooperation and agreement. It will also consider various proposals for the creation of international institutions and other cooperative measures. Yet, in considering these questions and in attempting to forge any cooperative arrangements, the Conference will have little guidance from the past. Precedents for international cooperation and regulation in the environmental area have thus far been sparse and the relevant international law is relatively undeveloped.⁷ This dearth of experience will increase the

6. See G.A. Res. 2398, 23 U.N. GAOR Supp. 18, at 2, U.N. Doc. A/7218 (1968); G.A. Res. 2567, 24 U.N. GAOR Supp. 30, at 38, U.N. Doc. A/7630 (1969); G.A. Res. 2581, 24 U.N. GAOR Supp. 30, at 44, U.N. Doc. A/7630 (1969). Cf. Report of U.N. Secretary General to the 47th Session of the Economic and Social Council on Problems of the Human Environment, U.N. Doc. E/4667 (1969); Reports of the Preparatory Committee for the U.N. Conference on the Human Environment for its three working sessions held in New York in March 1970, Geneva in Feb. 1971, and New York in Sept. 1971, U.N. Doc. A/Conf.48/PC.6, .9 and .13.

7. See authorities cited in note 5 *supra*. Cf. notes 156 & 167 *infra*. International activities in the environmental area are, however, rapidly proliferating, and more than a score of U.N. organs and agencies and other international organizations are presently engaged in environmental programs. See generally CONG. RESEARCH SERV., STAFF OF ENVIRONMENTAL POLICY DIV., 92D CONG., 1ST SESS., REPORT ON ENVIRONMENTAL ACTIVITIES OF INTERNATIONAL ORGANIZATIONS (Comm. Print 1971) (a report prepared for the use of the Senate Committee on Commerce); COUNCIL ON ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT 200-06 (1970) [hereinafter CEQ 1970 REPORT]; COUNCIL ON ENVIRONMENTAL QUALITY, SECOND ANNUAL REPORT 29-31 (1971) [hereinafter CEQ 1971 REPORT]; and the various papers included in LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT, *supra* note 5. The activities of international organizations include the World Meteorological Organization's (WMO) World Weather Watch; the World Health Organization's (WHO) work on fresh water supplies and sewage disposal; the Food and Agricultural Organization's (FAO) broad concerns with resource management; the International Labour Organization's (ILO) regulation of the environment of the work place; the U.N. Educational, Scientific and Cultural Organization's (UNESCO) Intergovernmental Oceanographic Commission (IOC) and Man and the Biosphere Program; the International Maritime Consultative Organization's (IMCO) activities in the field of marine pollution; the International Civil Aviation Organization's (ICAO) work on air and noise pollution connected with civil air transport; and the International Atomic Energy Agency's (IAEA) surveillance of radioactive substances in the environment. The Environment Committee of the Organization for Economic Cooperation and Development (OECD) is conducting significant work on the international economic effects of member countries' environmental policies. The North Atlantic Treaty Organization's (NATO) Committee on Challenges of Modern Society is studying special problems of industrialized societies. The Economic Commission for Europe is serving as a valuable forum for information exchange between Eastern and Western European nations on pollution control; it held an important symposium on this subject at Prague, Czechoslovakia, in May 1971 and has established a permanent body of Senior Environmental Advisers. In 1969, the International Council of Scientific Unions (ICSU) established a Special Committee on Problems of the Environment

difficulties the Conference may encounter both in developing practical programs for effective international action and in securing their acceptance by governments.

In this context, a study of the proposed Agreement and, more particularly, of the long history of developing United States-Canadian cooperation that preceded it may be of use.⁸ First, this United States-Canadian experience offers guidance for the solution of some of the specific problems that programs for international environmental cooperation may face: questions of framework and approach; institutional organization, function, and authority; determination of objectives; apportionment of burdens; coordination; and implementation. Second, at a time when international discussion has focused principally on global approaches to the solution of environmental problems, it calls attention to the important, if less dramatic, contribution that can be made by more limited bilateral and regional cooperative arrangements; indeed, it is arguable that such bilateral and regional arrangements will ultimately prove to be the most significant forms of international environmental cooperation.⁹

(SCOPE), which is coordinating global research on a number of environmental problems.

8. While this study deals primarily with U.S.-Canadian cooperation with respect to problems of pollution of the Great Lakes and other boundary waters, the two countries have also developed cooperative arrangements with respect to other aspects of environmental problems. The work of the International Joint Commission [hereinafter IJC] respecting boundary air pollution problems, which is briefly mentioned in this Article, is more fully discussed in Note, *International Air Pollution—United States and Canada—A Joint Approach*, 10 ARIZ. L. REV. 138 (1968). The Treaty with Great Britain and Ireland for the Protection of Migratory Birds in the United States and Canada, Aug. 16, 1916, 39 Stat. 1702 (1916), T.S. No. 628, which was involved in the famous case of *Missouri v. Holland*, 252 U.S. 416 (1920), is still in force. On June 1, 1971, the National Aeronautics and Space Administration announced that the United States and Canada had agreed on a joint program to use satellites and aircraft in surveying the natural environment. The joint program will advance remote sensing technology through monitoring of air, water, land, forest, and crop conditions, the mapping of ice movements and ocean currents in Canadian and U.S. waters, and the mapping of geologic, hydrologic, vegetation, and soil phenomena. NASA Press Release No. 71-95 (June 1, 1971). The United States is also in the process of developing bilateral relations on environmental problems with Mexico, Japan, and other countries. See CEQ 1971 REPORT, *supra* note 7, at 30.

9. See generally Stein, *The Potential of Regional Organizations in Managing Man's Environment*, in LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT, *supra* note 5. See also Frey-Wouters, *The Prospects for Regionalism in World Affairs*, in THE FUTURE OF THE INTERNATIONAL LEGAL ORDER 461 (R. Falk & C. Black ed. 1969).

The agenda for the 1972 U.N. Conference on the Human Environment, in its section concerned with the international organizational implications of action proposals, includes an item on "particular organizational requirements for meeting needs at regional levels." Report of the Preparatory Committee for the U.N. Conference on the Human Environment, 2d sess., Feb. 8-19, 1971, U.N. Doc. A/Conf.48/C.9, ¶ 20 (Agenda Item 6). The Secretary-General of the U.N. Conference on the Human Environment, Mr. Maurice Strong, has suggested as among the principles which might guide the decision of governments on organizational questions: "7. That it should

Finally, this experience may serve to suggest that the concept of international environmental cooperation has limitations as well as potentialities, and thus may provide a more realistic basis for the Stockholm Conference's work.

I. BACKGROUND

United States-Canadian cooperation regarding Great Lakes pollution problems has developed within a special geographical, economic, legal, and political context. A brief description of this setting may suggest the significance of these pollution problems and some of the reasons for the particular form this cooperation has taken.¹⁰

The United States-Canadian boundary is one of the longest in the world, extending for about 3,500 miles from Passamaquoddy Bay on the Atlantic to the Fuca Straits of Vancouver on the Pacific, and, along the Alaskan-Canadian boundary, for another 1,500 miles from the Pacific to the Arctic Ocean. About 2,000 miles of this boundary is water; it passes along rivers such as the St. Croix, St. John, and the St. Lawrence, through Lake Ontario, the Niagara River, Lake Erie, the Detroit River, Lake St. Clair, the St. Clair River, Lake Huron, the St. Marys River, and Lake Superior, and on to Rainy Lake and Lake of the Woods. In addition, a number of rivers, such as the Red, the Columbia, and the Yukon, flow across the boundary.

The Great Lakes constitute the largest fresh-water system in the world, representing about a quarter of the world's total fresh water

be an important consideration in the establishment of any additional or new machinery to provide strong capability at the regional level." Quoted in Gardner, *The International Organizational Implications of Action Proposals*, in *LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT*, *supra* note 5, manuscript at 6. See also *MAN'S IMPACT ON THE GLOBAL ENVIRONMENT*, *supra* note 5, at 6; Schachter & Serwer, *supra* note 5, at 111 ("[T]here has come to be a greater recognition of the need for regional pollution control organs since it is apparent that, although pollution is a global problem, it is not uniformly global. Regional arrangements in the Baltic, the North Sea, Mediterranean, Caribbean and perhaps the Arctic are now underway, and it is likely that these organs will have a decisive part to play in achieving day-to-day practical controls.")

10. The factual information in this section is drawn or collated principally from the following sources: GREAT LAKES BASIN COMM. & GREAT LAKES PANEL OF THE COMM. ON MULTIPLE USE OF THE COSTAL ZONE, NATL. COUNCIL ON MARINE RESOURCES & ENGR. DEV., GREAT LAKES INSTITUTIONS: A SURVEY OF INSTITUTIONS CONCERNED WITH THE WATER AND RELATED RESOURCES IN THE GREAT LAKES BASIN 1-2, 7, 12 (1969) [hereinafter GREAT LAKES INSTITUTIONS]; INTERNATIONAL JOINT COMM., CANADA AND UNITED STATES, POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST. LAWRENCE RIVER (1970) [hereinafter IJC LOWER LAKES REPORT]; D. PIPER, *THE INTERNATIONAL LAW OF THE GREAT LAKES* (1967); MacNish & Lawhead, *History of the Development of the Great Lakes and Present Problems*, in *ENGINEERING INST. OF CANADA & AM. SOC. CIVIL ENGRS., PROCEEDINGS OF THE GREAT LAKES WATER RESOURCES CONFERENCE 1*, June 24-26, 1968, Toronto; Great Lakes Basin Comm. Communicator, March 1971 (monthly newsletter).

supply. Of the total Great Lakes water area of 95,000 square miles, about two thirds is within United States jurisdiction and one third in Canadian jurisdiction. Of the total Great Lakes drainage basin area of some 300,000 square miles, about 59 per cent is in the United States and 41 per cent in Canada. Eight states, Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin, border on the Great Lakes and a number of others have close economic links with the region. In Canada, only the Province of Ontario borders on the Lakes, although the Province of Quebec also has considerable concern with Great Lakes problems.

In 1966 some 30 million people lived on or near the Great Lakes, comprising about one out of every three Canadians and one out of every eight Americans.¹¹ All indications are that the Great Lakes population is rapidly expanding; projections for the year 2000 suggest the emergence of a Great Lakes megalopolis with a population approaching 60 million people.¹²

The immense importance of the Great Lakes region to the two countries is indicated by the fact that the region accounts for over one half of the Canadian gross national product and about one fifth of the American gross national product. About 50 per cent of United States steel production and much of its automotive production is concentrated about the Lakes. With the development of the St. Lawrence Seaway the Great Lakes have now become part of a major international waterway stretching over 2,300 miles from the Atlantic Ocean to Duluth, Minnesota. Each year over 600 foreign vessels utilize the Great Lakes system, in addition to a domestic United States-Canadian fleet of another 600 vessels; over 250,000 pleasure craft are estimated to use Lakes Erie and Ontario alone.¹³

In view of the length of this common boundary and the substantial clustering of people and industry along certain portions of it, it is not surprising that problems of boundary waters and transboundary pollution have assumed a growing importance in United States-Canadian relations. While the concern of the two governments with

11. IJC LOWER LAKES REPORT, *supra* note 10, at 17. Major cities on the rim of the Lakes include Toronto, Hamilton, Port Huron, and Windsor in Canada; and Duluth-Superior, Milwaukee, Chicago, Gary, Detroit, Toledo, Cleveland, Erie, Buffalo, and Rochester in the United States.

12. MacNish & Lawhead, *supra* note 10, at 19.

13. IJC LOWER LAKES REPORT, *supra* note 10, at 75-76. In 1966, a total of about 246 million net tons of cargo moved via the Great Lakes. Of this total, about 185 million net tons were domestic, within either the U.S. or Canada; 47 million net tons moved between the two countries; and 14 million net tons were overseas traffic. In terms of ton miles, over 40% of all traffic on U.S. waterways moved on the Great Lakes. MacNish & Lawhead, *supra* note 10, at 26.

boundary pollution problems dates back at least to the early years of the twentieth century, these problems have assumed a new dimension and importance as a result of rapid industrial and population development during and after the Second World War.

It is now widely recognized that at a time when water demand problems have become more pressing and complex the environmental quality of the Great Lakes is rapidly deteriorating.¹⁴ Recent studies have confirmed that Lake Erie, particularly its western basin, is in an advanced state of eutrophication, largely as a result of excessive enrichment by nutrients, especially phosphorus; indeed, Lake Erie has become a prime example of the consequences of environmental neglect.¹⁵ Accelerated eutrophication is also occurring in Lake Ontario and the other Lakes are considered seriously threatened.¹⁶ A number of industries, such as fishing and recreation, have already been affected and there is growing concern that future industrial and urban development may be impeded. The sources of pollution include waste disposal from municipalities and industries, agricultural run-off, dredging, sedimentation, and waste from commercial vessels and pleasure craft.¹⁷ The consequences of this pollution on the water of the Lakes include eutrophication, oxygen depletion, biological changes, organic contamination from substances such as DDT and PCB, accumulation of solids, and accumulation

14. The IJC LOWER LAKES REPORT, *supra* note 10, represents the most current and comprehensive discussion of the problem of pollution in the Lower Lakes, and this discussion is broadly applicable to many aspects of Upper Lakes problems as well. For good summaries of sources, processes, effects, and costs of water pollution and water pollution control programs more generally, see, e.g., CEQ 1970 REPORT, *supra* note 7, at 29-59; CEQ 1971 REPORT, *supra* note 7, at 99-153; A. KNEESE & B. BOWER, *MANAGING WATER QUALITY: ECONOMICS, TECHNOLOGY, INSTITUTIONS* (1968); *WATER POLLUTION CONTROL AND ABATEMENT* (T. Willrich & N. Hines ed. 1967). See also D. ZWICK & M. BENSTOCK, *WATER WASTELAND* (1971) (Ralph Nader's Study Group Report on Water Pollution).

15. See, e.g., IJC LOWER LAKES REPORT, *supra* note 10, Conclusion 9, at 140-41. For comprehensive discussions of Lake Erie problems, see B. COMMONER, *supra* note 5, ch. 6; U.S. DEPT. OF INTERIOR, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, *LAKE ERIE REPORT: A PLAN FOR WATER POLLUTION CONTROL* (1968); Reitze, *Wastes, Water, and Wishful Thinking: The Battle of Lake Erie*, 20 CASE W. RES. L. REV. 5 (1968).

16. See IJC LOWER LAKES REPORT, *supra* note 10, Conclusion 9, at 140-41. See also U.S. DEPT. OF INTERIOR & N.Y. STATE DEPT. OF HEALTH, *WATER POLLUTION PROBLEMS AND IMPROVEMENT NEEDS: LAKE ONTARIO AND ST. LAWRENCE RIVER BASINS* (1968). The U.S. National Oceanic and Atmospheric Administration and the Canadian Centre for Inland Waters have recently announced plans for a joint U.S.-Canadian year-long intensive study of Lake Ontario. This effort, which is called the International Field Year for the Great Lakes, will begin April 1, 1972, and will be the most ambitious research effort ever directed at any of the Great Lakes, involving some 600 scientists and technicians and an estimated cost of \$15 million. N.Y. Times, Jan. 22, 1972, § M, at 31, col. 4.

17. IJC LOWER LAKES REPORT, *supra* note 10, at 72-83.

of oil and toxic materials, such as mercury, in trace amounts.¹⁸ While pollution occurs on both sides of the border, the bulk of the problem appears to originate from the larger concentrations of population and industry on the American side.¹⁹

As these dangers have become more widely perceived, public concern on both sides of the border has mushroomed, and the problem of control of Great Lakes pollution has now achieved a leading place on both governments' agendas. A measure of government recognition of the seriousness of this problem is the statement by Mitchell Sharp, made at the recent Joint Ministerial Meeting, that pollution of the Great Lakes had reached the point where "two of the richest societies on earth are knowingly and wantonly poisoning this unique resource, and by extension, each other."²⁰ A variety of national and international measures to cope with this situation are now being undertaken, but it has become increasingly clear that effective solutions will involve major governmental commitments, years of intensive effort, and very substantial costs.

Solutions may also involve more subtle difficulties. In view of the federal character of both governments, efforts to control pollution in the Great Lakes raise particularly complex jurisdictional questions. The waters of the Lakes are not "high seas" for international purposes; each nation treats the Lakes' waters on its side of the international boundary as its own "internal waters." United States law regards each of the eight riparian states as owning, in its respective public capacity, the Lake beds adjacent to its coast out to the international boundary and also as having certain broad regulatory powers in its adjacent waters, at least in the absence of federal assertions of authority.²¹ The same principle appears to be appli-

18. *Id.* at 84-107. On the mercury pollution problem, which in April 1970 resulted in Canada's banning fishing on its side of the St. Clair River and Detroit River and Lake St. Clair, and in partial bans by Ohio in Lake Erie, see, e.g., *TIME*, May 4, 1970, at 85; *Wall St. J.*, April 28, 1970, at 1, col. 1. This situation gave rise to the case of *Ohio v. Wyandotte Chem. Corp.*, 401 U.S. 493 (1971), discussed in note 176 *infra*.

19. As to the Lower Lakes, see IJC LOWER LAKES REPORT, *supra* note 10, Table 2 at 80, and Table 3 at 82. This U.S. concentration is particularly true of phosphorus inputs into Lake Erie. In 1967 the input of total phosphorus from U.S. municipal sources into Lake Erie was 35.7 million pounds, of which 25 million pounds came from detergents; whereas the input of total phosphorus from Canadian municipal sources into Lake Erie was 2.5 million pounds, of which 1.3 million pounds came from detergents. As to Lake Ontario, the U.S. municipal input of phosphorus was 7.7 million pounds, of which 5.4 million came from detergents, and the Canadian municipal input was 7.0 million pounds, of which 3.5 million came from detergents. *Id.* at 83.

20. *N.Y. Times*, June 11, 1971, at 11, col. 1.

21. See, e.g., D. PIPER, *supra* note 10, at 19. The principle of state ownership of the Lake beds is affirmed in § 3 of the Submerged Lands Act of 1953, 43 U.S.C. § 1311

cable in Canada with respect to the Province of Ontario, the only Great Lakes riparian province.²² In each country, however, the federal government retains substantial regulatory powers with respect to matters affecting the Lakes, though the division of power between the respective federal and state or provincial governments appears to differ somewhat between the two countries. In the case of the United States, there is little question that the federal government has broad constitutional authority under the commerce power and other constitutional grants to regulate and control virtually any activity contributing directly or indirectly to Great Lakes pollution. Should the federal government choose to exercise its authority, any state or local government interference with such regulation would be considered unconstitutional and invalid.²³ Moreover, the treaty power may constitute an additional source of federal authority in this area.²⁴ In Canada, however, it is less clear that federal powers are so broad. Respectable arguments have been made that under relevant provisions of the British North America Act provincial authority over

(1970). See also *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892); *Hilt v. Weber*, 252 Mich. 198, 200, 233 N.W. 159, 161 (1930). The Supreme Court has recognized the vital interest of the states in the control of water resources and has specifically conceded the power of the states to exercise control over navigable waters for the interests of their citizens until Congress in some way asserts a superior power. *United States v. Rio Grande Dam & Irrigation Co.*, 174 U.S. 690, 703 (1899).

22. D. PIPER, *supra* note 10, at 19.

23. Congress has power to regulate all navigable waters under the commerce clause, U.S. CONST. art I, § 8, cl. 3, and navigability is broadly defined. See, e.g., *Gibbons v. Ogden*, 22 U.S. (9 Wheat.) 1 (1824); *Pollard's Lessee v. Hagan*, 44 U.S. (3 How.) 212 (1845). With respect to pollution, see *United States v. Republic Steel Corp.*, 362 U.S. 482 (1960). See also Hines, *Nor Any Drop To Drink: Public Regulation of Water Quality, Part III: The Federal Effort*, 52 IOWA L. REV. 799, 800 (1967), who suggests: "It seems relatively clear that constitutionally Congress could preempt nearly the entire field of water quality control, if it so elected." See generally 2 R. CLARK, *WATERS AND WATER RIGHTS* ch. 7 (1967); H. ELLIS, J. BEUSCHER, C. HOWARD & J. DEBRAAL, *WATER USE LAW AND ADMINISTRATION IN WISCONSIN* ch. 17 (1970); Edelman, *Federal Air and Water Control: The Application of the Commerce Power To Abate Interstate and Intrastate Pollution*, 33 GEO. WASH. L. REV. 1067 (1965).

24. U.S. CONST. art. VI. A treaty dealing with Great Lakes pollution problems appears to be a clearly legitimate subject of U.S. foreign policy concern. See, e.g., *Missouri v. Holland*, 252 U.S. 416 (1920). See generally RESTATEMENT (SECOND) OF FOREIGN RELATIONS LAW §§ 117, 121 (1965). The interests of the nation are more important than those of any state, and the federal government may act to prevent a state from interfering with a national treaty obligation. *Sanitary Dist. v. United States*, 266 U.S. 405, 425-26 (1925). Cf. *First Iowa Hydro-Elec. Coop. v. FPC*, 328 U.S. 152, 171 (1946); *Missouri v. Holland*, 252 U.S. 416 (1920). Treaty obligations may give the federal government an additional basis for authorizing improvements in international waterways. *Arizona v. California*, 283 U.S. 423, 457-58 (1931). However, in view of the broad expanse of the article I powers of Congress it may be questioned whether the exercise of the treaty power with respect to Great Lakes problems would in practice constitute any significant addition to existing congressional authority. See, e.g., Henkin, *The Treaty Makers and the Law Makers: The Law of the Land and Foreign Relations*, 107 U. PA. L. REV. 903 (1959).

most aspects of water pollution affecting the Great Lakes is constitutionally protected from federal intrusion and that Canadian federal authority in this field, even when exercised pursuant to treaty, is inherently limited.²⁵

In any event, whatever the theoretical reach of American and Canadian federal powers, in practice the regulation of water pollution in each country has remained largely in state, provincial, and local hands. It is only recently that the respective federal governments have begun to exercise their regulatory authority in any substantial way, and the burden of regulation is still primarily nonfederal in character.²⁶ As a result, the law governing Great Lakes pollution continues to be a complex hodgepodge of proliferating and occasionally inconsistent laws, regulations, and ordinances issued separately by the two federal governments and their various agencies, the eight riparian states of the United States, the Province of Ontario, and the hundreds of cities, towns, and other local jurisdictions that exercise relevant authority. This jurisdictional complexity has been a major obstacle in efforts for the coordinated handling of over-all Great Lakes problems.²⁷

Finally, it is worth noting that United States-Canadian efforts to deal with Great Lakes pollution problems are but one aspect of a broader system of relations between the two countries, which has a unique and special character. On the one hand, United States-Canadian relations have been remarkably amicable: the two countries have been at peace since 1814, the border has been demilitarized since 1817,²⁸ and the two nations have long been linked by strong cultural and economic bonds. Moreover, the two governments have developed a strong tradition of formal and informal peaceful adjustment of their disagreements and disputes. They have relied heavily on such formal legal techniques as international agreement, the

25. See Landis, *Legal Control in Canada of Pollution in the Great Lakes Drainage Basin*, in PROCEEDINGS OF THE GREAT LAKES RESOURCES CONFERENCE, *supra* note 10, at 158-200; Landis, *Legal Controls of Pollution in the Great Lakes Basin*, 48 CAN. B. REV. 66, 96-106 (1970). See also Gibson, *The Constitutional Context of Canadian Water Planning*, 7 ALBERTA L. REV. 71 (1969); Note, *An Opinion on the Constitutional Validity of the Proposed Canada Water Act*, 28 U. OF TORONTO FACULTY OF L. REV. 74 (1970).

26. See text accompanying notes 228-52 *infra*.

27. See pt. III. F. *infra*.

28. The Rush-Bagot Agreement, April 28-29, 1817, 8 Stat. 231 (1817), T.S. No. 110 1/2. On the U.S.-Canadian disarmament arrangement, see generally D. PIPER, *supra* note 10, at 104-11; 3 M. WHITEMAN, DIGEST OF INTERNATIONAL LAW 741-52 (1964). On international boundary arrangements and the Permanent International Boundary Commission established by the Treaty with Great Britain in Respect of Boundary Between the United States and Canada, Feb. 24, 1925, 44 Stat. 2102 (1925), T.S. No. 720, see D. PIPER, *supra* note 10, at 8-17.

establishment of joint institutions, and arbitration.²⁹ There are, for example, presently some 200 bilateral agreements in force between the two countries, as well as numerous lower-level and less formal arrangements.³⁰ On the other hand, United States-Canadian relations have also been marked by certain strong and continuing differences. In particular, Canada has manifested a persistent, strongly felt, and understandable fear of political, economic, and cultural domination by its more populous and powerful neighbor to the south, and Canadian nationalists have frequently responded with resentment to any United States policies that appeared to exploit superior American power or wealth at Canada's expense.³¹ When issues of this nature have arisen United States-Canadian relations have on occasion proved sensitive and delicate.

In recent years, the problem of Great Lakes pollution appears to have become, to some extent, one of those sensitive issues between the two countries.³² The Great Lakes are regarded by Canada as crucial to its future. Not only does a substantial part of Canada's population and industry cluster on the Lakes, but in addition Canada is currently experiencing a broad reawakening of national pride in its natural environment, and the government has been militant in efforts to protect the Canadian environment from harm by external interests.³³ Since much of Great Lakes pollution stems from the giant urban and industrial concentrations on the American side of the border, the situation from a Canadian viewpoint may seem to call for the most urgent and far-reaching measures by the United States in order to prevent irreversible harm to Canadian environmental interests and economic development. Canadians may consider that, in view of Canada's lesser contribution to the problem, it should arguably assume less of the burden of correction. The United States

29. See generally D. DEENER, CANADA-UNITED STATES TREATY RELATIONS (1963); D. PIPER, *supra* note 10.

30. U.S. DEPT. OF STATE, TREATIES IN FORCE 30-42 (1970).

31. See generally NEIGHBORS TAKEN FOR GRANTED (L. Merchant ed. 1966), esp. ix-xv, 148-64; THE AMERICAN ASSEMBLY, THE UNITED STATES AND CANADA (J. Sloan ed. 1964), esp. ch. 6; and the various proceedings of the recent series of annual Seminars on Canadian-American Relations held at the University of Windsor. Cf. Lynch, *Canada's New Anti-Americanism*, Wall St. J., Nov. 12, 1971, at 12, cols. 4-6.

32. Certain aspects of this issue, in particular the questions of apportionment and detergents, are more fully discussed in pt. II. D. & E. *infra*.

33. I have described this Canadian concern in another context also involving some element of United States-Canadian policy conflict. Bilder, *The Canadian Arctic Waters Pollution Prevention Act: New Stresses on the Law of the Sea*, 69 MICH. L. REV. 1 (1970). It is relevant that Canada chose as its project for exploration in connection with the NATO program on "Challenges of Modern Society" (see note 7 *supra*) the subject of control of pollution in inland waters, with particular reference to the Great Lakes.

would, of course, prefer that Canada share with it the costs and burdens of remedial action to the fullest extent possible. Moreover, while the United States views the problem of Great Lakes pollution as an important one, it has a relatively smaller proportion of its population and industry centered on the Lakes and tends to see this issue as only one among a great many problems that press with equal urgency for its limited resources. These differences between the two countries have only rarely surfaced publicly and, it is hoped, have been at least temporarily resolved by the proposed Agreement. Should current efforts to resolve these Great Lakes pollution problems prove ineffective, however, significant foreign relations issues could re-emerge.

II. THE DEVELOPMENT OF GREAT LAKES ENVIRONMENTAL COOPERATION: FRAMEWORK, INSTITUTIONS, AND HISTORY

A. *The 1909 Treaty*

The basic framework for American-Canadian cooperation respecting boundary waters problems is the 1909 Treaty,³⁴ which establishes the International Joint Commission between the United States and Canada.³⁵ The Treaty, which developed out of earlier ad hoc efforts

34. The 1909 Treaty was signed by Great Britain on behalf of Canada, which did not acquire full powers in treaty-making until 1923. However, the Treaty has been implemented completely by Canada. See D. PIPER, *supra* note 10, at 5-7. See generally C. BÉDARD, *LE RÉGIME JURIDIQUE DES GRANDS LACS DE L'AMÉRIQUE DU NORD ET DU SAINT-LAURENT* (1966).

35. The literature on the 1909 Treaty and the International Joint Commission is surprisingly extensive, if relatively inaccessible. L. BLOOMFIELD & G. FITZGERALD, *BOUNDARY WATERS PROBLEMS OF CANADA AND THE UNITED STATES (THE INTERNATIONAL JOINT COMMISSION 1912-1958)* (1958), is an extremely useful, concise study containing a history of the Commission, a summary of its dockets through 1958, and appendices that include the Treaty, Rules of Procedure, national implementing legislation, membership on the Commission between 1911-1958, related treaties, lists of boundary waters and waters crossing the boundary, a selected bibliography, and maps showing the location of the various references and applications. For an earlier study, see C. CHACRO, *THE INTERNATIONAL JOINT COMMISSION BETWEEN THE UNITED STATES OF AMERICA AND THE DOMINION OF CANADA* (1932). The Commission is also described and its dockets through the early 1960's summarized in 3 M. WHITEMAN, *supra* note 28, at 826-71. See also D. PIPER, *supra* note 10, at 72-90.

Various IJC Commissioners have also written excellent brief descriptions of the Commission and its work. I have drawn particularly on Welsh, *Role of the International Joint Commission*, in *ENGINEERING INST. OF CANADA & AM. SOC. CIVIL ENGRS., PROCEEDINGS OF THE GREAT LAKES WATER RESOURCES CONFERENCE 1969*, Toronto, at 871-75; Welsh, *The Work of the International Joint Commission*, published in 59 *DEPT. STATE BULL.* 311 (1968); Welsh & Heeney, *International Joint Commission—United States and Canada*, in 5 *INTL. CONFERENCE ON WATER FOR PEACE 104-09* (1967) (Paper P/217 presented at Conference held in Washington, D.C., on May 23-31, 1967); C. Ross, *The International Joint Commission*, March 7, 1970 (address at the International Symposium on Legal Aspects of Pollution, University of Manitoba, on file with the *Michigan Law Review*). See also Heeney, *Diplomacy with a Difference: The Inter-*

to deal with boundary waters questions,³⁶ was designed primarily to protect the levels and navigability of the Great Lakes and other boundary waters against unilateral diversion or obstruction, but it has provided the basis for an increasing involvement by the Commission in pollution and other problems as well. While the Treaty is usually referred to as the "Boundary Waters Treaty," its full title, "Treaty with Great Britain Relating to Boundary Waters, and Questions Arising Between the United States and Canada," is significant. According to its Preamble, the purpose of the Treaty is

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

Thus, the potential reach of the Treaty extends beyond boundary waters issues to all boundary questions, and arguably to other questions of common concern as well.

The Treaty distinguishes (1) "boundary waters," which are defined as those waters along which the international boundary runs; (2) "tributary waters," which are defined as the waters flowing into

national Joint Commission, reprinted from INCO [International Nickel Co.] MAGAZINE, Oct. 1960, on file with the *Michigan Law Review*; G. Kyte, *Organization and Work of the International Joint Commission* (pamphlet issued at Ottawa in 1937); Weber, *Activities of the International Joint Commission, United States and Canada*, 31 SEWAGE & INDUS. WASTE 71 (1959); Weber, *Functions of the International Joint Commission*, J. OF POWER DIV., PROC. OF AM. SOC. CIVIL ENGRS., Nov. 1968, at 177.

For scholarly discussions, see the excellent recent articles by Erichsen-Brown, *Legal Implications of Boundary Water Pollution*, 17 BUFFALO L. REV. 65 (1967); Jordan, *Recent Developments in International Environmental Pollution Control*, 15 MCGILL L.J. 279 (1969). See also Adams, *Water Pollution Control in the Great Lakes Region*, 37 U. DET. L.J. 96 (1959); Griffin, *A History of the Canadian-United States Boundary Waters Treaty of 1909*, 37 U. DET. L.J. 76 (1959); Waite, *The International Joint Commission—Its Practice and Its Impact on Land Use*, 13 BUFFALO L. REV. 93 (1963); Note, *supra* note 8.

36. The history of the Treaty is summarized in L. BLOOMFIELD & G. FITZGERALD, *supra* note 35, at 2-14; G. Kyte, *supra* note 35; D. PIPER, *supra* note 10, at 72-82; Griffin, *supra* note 35; Heeney, *supra* note 35. Briefly, the Treaty grew out of the work of an Ad Hoc Temporary International Waterways Commission created by concurrent legislation of the U.S. and Canada in 1903 for the purpose of investigating and reporting upon the condition and uses of the boundary waters and making recommendations for navigational improvements and regulations. The temporary group, and particularly its Chairman George Gibbons, an Ontario lawyer, became convinced that effective development of the boundary water resources required some prior agreement on principles and a permanent body to apply them. Gibbons went to Washington in 1907 to explore possibilities. U.S. Secretary of State Elihu Root was at first unenthusiastic but was finally won over. The International Waterways Commission was discontinued after the 1909 Treaty entered into force.

boundary waters; (3) waters flowing from boundary waters; and (4) the waters of rivers flowing across the boundary.³⁷ For example, since the International Boundary does not run through Lake Michigan, that Lake is considered a tributary water rather than a boundary water.

The rights and obligations of the countries under the Treaty differ among these various categories of waters. Thus, the Treaty provides that navigation of all boundary waters shall be free and open to the inhabitants and vessels of each country without discrimination; this same right shall apply to the waters of Lake Michigan and to canals connecting boundary waters.³⁸ On the other hand, the Treaty provides that each country retains exclusive jurisdiction and control over the use and diversion of all waters on its own side of the boundary that in their natural channels would flow across the boundary or into boundary waters.³⁹ However, if through interference with or diversion of such waters injury is caused on the other side of the boundary, any injured party is entitled to the same legal remedies as if that injury had taken place in the country where the diversion or interference occurred.⁴⁰ Moreover, neither party surrenders rights it may have to object to interference with or diversion of waters on the other side of the boundary that would have the effect of materially injuring navigation on its own side of the boundary.⁴¹

A principal purpose of the 1909 Treaty is the regulation of uses, obstructions, or diversions of the boundary waters, and the Commission is given broad powers in this respect, which again are stated with reference to particular categories of waters. Unless otherwise provided by special agreement, the Commission's approval is required for any uses, obstructions, or diversions of boundary waters on either side of the boundary that affect the natural level or flow of boundary waters on the other side of the boundary.⁴² Moreover, the Commission's approval is required for the construction or maintenance "of any remedial or protective works or any dams or other obstructions in waters flowing from boundary waters or in waters at a lower level than the boundary in rivers flowing across the boundary, the effect of which is to raise the natural level of waters on the other side of

37. 1909 Treaty Preliminary Article.

38. 1909 Treaty art. I.

39. 1909 Treaty art. II, first para.

40. 1909 Treaty art. II, first para.

41. 1909 Treaty art. II, second para.

42. 1909 Treaty art. III, first para.

the boundary."⁴³ In passing upon such cases, the Commission is to be guided by certain rules and principles.⁴⁴ One of these is that each party shall have, on its own side of the boundary, equal and similar rights in the use of the boundary waters.⁴⁵ Another is that an order of precedence is established among various uses of the waters, namely: (1) uses for domestic and sanitary purposes; (2) uses for navigation; and (3) uses for power and irrigation purposes. No use shall be permitted by the Commission that tends materially to conflict with or restrain a preferred use.⁴⁶

Article IV of the Treaty includes a provision that "boundary waters and water flowing across the boundary shall not be polluted on either side to the injury of health or property on the other."⁴⁷ Neither the term "pollution" nor the term "injury" is defined, and the Treaty is silent with respect to any procedures for enforcement of this obligation.

Finally, the Treaty establishes broad and flexible provisions concerning the handling of disputes and other questions between the governments. Article IX authorizes the Commission to render advisory reports to the governments at their request. It provides that "any other questions or matters of difference arising between [the two countries] involving the rights, obligations, or interests of either in relation to the other or to the inhabitants of the other, along the common frontier . . . shall be referred from time to time to the . . . Commission for examination and report" whenever either government requests such reference. The Commission is authorized in each case so referred to examine and report upon the facts and circumstances of the particular questions, together with such conclusions and recommendations as may be appropriate, subject, however, to any restrictions that may be imposed by the terms of the reference. "Such reports of the Commission shall not be regarded as decisions of the questions or matters so submitted either on the facts or the law, and shall in no way have the character of an arbitral award."⁴⁸ Procedures are set forth governing such advisory references. In addition, Article X provides detailed procedures under which questions or matters of differences may be referred to the Commission, by the consent of the two governments, for a binding arbitral decision or

43. 1909 Treaty art. IV, first para.

44. 1909 Treaty art. VIII.

45. 1909 Treaty art. VIII, second para.

46. 1909 Treaty art. VIII, third para.

47. 1909 Treaty art. IV, second para.

48. 1909 Treaty art. IX, third para.

finding. To date, however, the provisions of Article X have never been utilized.⁴⁹

B. *The International Joint Commission and Its Procedures*

The provisions of the Treaty are implemented principally through the activities of the International Joint Commission. The Commission consists of six members, three (including a chairman) from each country.⁵⁰ United States Commissioners are appointed by and serve at the pleasure of the President; Canadian Commissioners are appointed by order-in-council of the Canadian government and serve at the pleasure of that government.⁵¹ Each of the two national sections has appointed a permanent secretary; the two national secretaries act as joint secretaries at Commission meetings.⁵² Otherwise the Commission maintains an exceptionally small staff, typically drawing on personnel of agencies of the respective governments, as need has arisen, for the performance of specific tasks. Permanent IJC offices are maintained in Washington and Ottawa,⁵³ but meetings and public hearings are held wherever convenient,⁵⁴ the Canadian chairman presiding at meetings in Canada and the United States chairman presiding at meetings in the United States.⁵⁵ Under its rules the Commission is required to meet at least semiannually,⁵⁶ but in practice, especially in recent years, it has met much more frequently. Decisions of the Commission are made by a majority of the Commissioners, irrespective of their nationality, with provision for separate dissenting reports.⁵⁷

Broadly speaking, the IJC's responsibilities fall into two principal categories. First, under Articles II, IV, and VIII, it exercises the essentially regulatory or licensing function of passing upon applications for works that affect boundary water levels or flows. No individual or corporation may erect a mill or dam upon a boundary water or certain other waters without securing the Commission's prior approval.

This licensing process is initiated with the filing of an application

49. See, e.g., 3 M. WHITEMAN, *supra* note 28, at 816.

50. 1909 Treaty art. VII.

51. 1909 Treaty art. VII.

52. 1909 Treaty art. XII, second para.; IJC R.P. 4. (The Commission's various activities are governed by published Rules of Procedure. 1909 Treaty art XII, final para. The Rules are available from the Commission in pamphlet form.)

53. IJC R.P. 3.

54. 1909 Treaty art. XII, first para.; IJC R.P. 5.

55. IJC R.P. 2.

56. IJC R.P. 5(1).

57. 1909 Treaty art. VIII, final para.

for approval by the persons or corporate bodies concerned.⁵⁸ Such applications have concerned work ranging from simple log booms on the Rainy River to major hydroelectric developments on the St. Lawrence. The applicant has the burden of furnishing all necessary information and data, and other persons interested may intervene in support of or opposition to the application. The Commission usually holds public hearings on the application, frequently in both countries. The Commission then issues its order, which is final. If it wishes, the Commission may make its approval conditional upon the construction of remedial or protective works to compensate as far as possible for the particular use or diversion proposed, and may also require suitable and adequate provision for protection against injury of any interests on either side of the boundary. In some cases, when the IJC has given only conditional approval, it has appointed an international board of control to exercise continuing supervision and ensure compliance with the conditions.⁵⁹

The Commission's responsibilities under Article IX of the Treaty, which concerns requests by the two governments for investigation of and recommendation on specific problems, are performed pursuant to "references."⁶⁰ Only the national governments can initiate investigations; the Commission has no independent power of inquiry. Moreover, while the Treaty suggests that a single government may make a reference, in practice all references have been made by joint or concurrent requests.⁶¹ Under Article IX, the subject of a reference is not restricted to boundary waters or to even closely related problems but may embrace "any other questions or matters of difference arising between [the two countries] involving the rights, obligations, or interests of either in relation to the other or to the inhabitants of the other, along the common frontier." References have in fact been made on an extremely wide range of subjects,⁶² including regulation of the level of the Great Lakes,⁶³ preservation

58. The application procedures are contained in IJC R.P. 12-25.

59. Fourteen international boards of control are presently operating; they cover Kootenay Lake, St. Lawrence River, Niagara River, Rainy Lake, Osoyoos Lake, Skagit River, Columbia River, Souris River, Prairie Portage, Lake Champlain, St. Croix River, Lake Superior, Lake of the Woods, and the apportionment of the waters of the St. Marys and Milk Rivers.

60. Reference procedures are contained in IJC R.P. 26-29.

61. See, e.g., Waite, *supra* note 35, at 111.

62. See, e.g., the listing and description of the various dockets, including references, in L. BLOOMFIELD & G. FITZGERALD, *supra* note 35, and in 3 M. WHITEMAN, *supra* note 28, at 826-72.

63. IJC Doc. No. 82 (1964).

of the American Falls at Niagara,⁶⁴ the water resources of the Columbia River region,⁶⁵ the tidal power potential of Passamaquoddy Bay,⁶⁶ and a considerable number and variety of water and air pollution problems.⁶⁷ Some of these references have been of outstanding significance: The 1944 Columbia River reference laid the basis for the negotiation of the landmark Columbia River Treaty of 1961 between the two countries;⁶⁸ the 1964 Great Lakes water levels reference, which is in effect today, involves the most extensive hydrological survey ever attempted;⁶⁹ and the 1964 Lake Erie-Lake Ontario-International St. Lawrence Pollution Reference involved what is probably the most extensive, detailed, and scientifically sophisticated study of a major water environment yet undertaken and has led to current negotiation of the proposed Agreement.⁷⁰

A reference is normally initiated by identical letters from each government to the IJC specifically describing the subject matter for investigation and the action requested.⁷¹ The letters typically authorize the Commission in conducting its investigation to utilize the services of specially qualified personnel of the technical agencies of the two countries, acting in an expert rather than a representative capacity, and also to draw upon such information and technical data as those agencies may possess.⁷²

Upon receipt of the reference, the Commission has occasionally held an initial round of public hearings to acquaint itself with the problem. When appropriate it has frequently carried out the investigative phase of its assignment through appointment of an international technical advisory board, which normally includes personnel

64. IJC Doc. No. 86 (1967).

65. IJC Doc. No. 51 (1944).

66. IJC Doc. No. 60 (1948).

67. See pt. II. C. *infra*.

68. See, e.g., J. KRUTILLA, *THE COLUMBIA RIVER TREATY: THE ECONOMICS OF AN INTERNATIONAL RIVER BASIN DEVELOPMENT* (1967), esp. ch. 4.

69. See, e.g., Piper, *A Significant Docket for the International Joint Commission*, 59 AM. J. INTL. L. 593 (1965).

70. See notes 110-16 *infra* and accompanying text.

71. See, e.g., the questions presented in the Lower Lakes Pollution Reference, IJC Doc. No. 83 (1964), set forth in text accompanying notes 125 *infra*. For the text of the Reference in that matter, see IJC LOWER LAKES REPORT, *supra* note 10, at 161-62.

72. See, e.g., the language in the Lower Lakes Pollution Reference:

In the conduct of its investigation and otherwise in the performance of its duties under this reference, the Commission may utilize the services of engineers and other specially qualified personnel of the technical agencies of Canada and the United States and will so far as possible make use of information and technical data heretofore acquired or which may become available during the course of the investigation.

IJC LOWER LAKES REPORT, *supra* note 10, at 162.

from federal, state, provincial, or other official departments or agencies of the two governments, who have particular responsibilities and expertise concerning the subject matter of the reference.⁷³ The technical board organizes and carries out the necessary technical work and field studies, drawing when necessary upon the facilities of relevant agencies of the two governments and consulting with interested and knowledgeable persons. Progress reports may be submitted to the Commission as appropriate. Upon completion of its work the board files its formal report and recommendations with the Commission.

Upon receipt of the board's report the Commission normally publishes and distributes it to interested persons and organizations in both countries. It will then usually schedule public hearings, typically in each country in the particular areas concerned, during which interested persons may under informal procedures present evidence or comment on the board's findings and recommendations. Then, drawing upon the board's report, material presented at the hearings, and other information and advice received, the Commission prepares and submits its own report and recommendations to the two governments. In contrast with applications, the Commission's recommendations respecting references are not binding, and either government is free to accept or reject them. With but few exceptions, the governments have formally "accepted" the recommendations,⁷⁴ although such acceptance does not necessarily imply that further governmental action has been taken pursuant to those recommendations.

While the IJC's role in the reference procedure has typically ended with the submission of its report, in recent years the Commission has on occasion recommended that the governments authorize it to appoint an international advisory board to maintain continuing surveillance over compliance with objectives recommended in the Commission's report. The governments have in several instances complied with this recommendation and five such advisory boards are presently operating.⁷⁵ In addition to the regular activities of the

73. Eight international investigative boards are currently operating; these concern the American Falls, St. Clair-Detroit Rivers air pollution, Lake Ontario-St. Lawrence River water pollution, Lake Erie water pollution, Great Lakes levels, St. John River engineering, Souris-Red Rivers engineering, and Roseau River engineering.

74. The Commission's 1967 Report on the 1962 reference on cooperative development of the water resources of the Pembina River Basin, Doc. 76, has not yet been accepted.

75. International Air Pollution Advisory Board; International Red River Pollution Board; International Rainy River Water Pollution Board; Advisory Board of Control of Water Pollution St. Croix River; and Advisory Board to the IJC on Control of

advisory boards, the IJC has recently experimented with the technique of calling public international meetings to inquire into the progress being made with respect to recommendations accepted by the governments.⁷⁶ These developments have involved the Commission in a continuing, though very limited, administrative role.

Since the IJC commenced operations in 1912, it has dealt with 92 applications and references.⁷⁷ During this sixty-year period, there has been a gradual but steady shift in the burden of the Commission's work from applications to references: During the period 1912 to 1944, the Commission dealt with 39 applications and 11 references; in the period since 1944, it has handled 19 applications and 23 references.⁷⁸ Moreover, many of the recent applications have been comparatively minor in importance, whereas a number of the recent references have involved issues of major significance. The fact that references now comprise the major work of the Commission reflects the increased willingness and desire of the two governments to employ the IJC for a widening range of common problems and tasks, a situation which imposes upon the Commission a far greater role than the limited one originally envisioned in 1909. It also demonstrates the remarkable adaptability of the 1909 Treaty, which through this change of emphasis in the nature of the Commission's work has assumed a growing importance in United States-Canadian relations.

Pollution of Boundary Waters (Lake Erie-Ontario Section and Lakes Superior-Huron-Erie Section). For an example of the work of such boards, see the Report prepared by the Lakes Erie-Ontario Advisory Board, *The Niagara River Pollution Abatement Progress* (Aug. 1971).

76. See Welsh, *The Work of the International Joint Commission*, *supra* note 35, at 313. The first such meeting was held in January 1968; it concerned pollution of the Niagara River. Similar meetings have been held at St. Stephen, New Brunswick (pollution of the St. Croix River), at Sault Ste. Marie, Michigan (pollution of the St. Marys River), and Windsor, Ontario (pollution of the St. Clair and Detroit Rivers). See, e.g., the IJC Notice of Oct. 8, 1971, of the convening of a public meeting on Dec. 16, 1971, in Niagara Falls, N.Y., "to inquire into the progress made in the U.S. and Canada since 1967 in the abatement of pollution of the Niagara River from municipal and industrial sources and to ascertain why the Water Quality Objectives for the River are not being met," and also informing the public of the availability of the Advisory Board Report on this subject, *supra* note 75.

77. See IJC Doc. Index. The dockets are also listed and described in L. BLOOMFIELD & G. FITZGERALD, *supra* note 35, at 65-205 (through Doc. No. 72, Aug. 1956), and in 3 M. WHITEMAN, *supra* note 28, at 826-72 (through Doc. No. 80, March 1964). The latest docket number is No. 93 (1971), an application concerning Cominco Kootenay Lake. The discrepancy in the docket numbers may be explained by the fact that Doc. No. 50 was assigned to the Rainy Lake Investigation under the Protocol, which was technically neither an application nor a reference.

78. See IJC Doc. Index. For a similar breakdown of the docket as of several years ago, see Welsh & Heeney, *supra* note 35, at 106; Welsh, *The Work of the International Joint Commission*, *supra* note 35, at 313.

C. *The Commission's Activities Regarding Pollution*

Our particular concern, of course, is the IJC's work in dealing with problems of boundary waters pollution and, in particular, pollution of the Great Lakes. While Article IV of the Treaty provides that boundary and transboundary waters shall not be polluted on either side of the boundary to the injury of health or property on the other, it does not confer any specific power on the IJC to enforce the provision or provide any other procedures for implementing this obligation. Nevertheless, the IJC has been gradually entrusted with a growing role in dealing with pollution matters through a series of references under Article IX, and pollution has become one of the Commission's principal concerns. To date, the IJC has handled ten references relating to pollution, eight of which have been received since the Second World War.⁷⁹

It is interesting to note that one of the first references to the IJC under Article IX of the Treaty, made only shortly after the Commission was constituted, was a 1912 request that it investigate and report upon the causes, extent, location and remedies of pollution of boundary waters on one side of the boundary which extended to and affected the boundary waters on the other side.⁸⁰ The request was apparently related to recurrent outbreaks of typhoid fever in various of the Great Lakes and connecting waters communities, and the Commission's subsequent investigation was essentially a bacteriological study of this region. The Commission submitted a comprehensive report in September 1918 with a finding that, while the Great Lakes beyond the coastal waters and mouths of tributary rivers were pure, the shore waters and river mouths themselves were in various states of serious pollution to an extent that rendered the water unpure and unfit for drinking purposes.⁸¹ The survey disclosed "a situation along the frontier which [was] generally chaotic,

79. These pollution references have the following IJC docket numbers and titles: No. 4, Pollution of Boundary Waters (1912); No. 25, Trail Smelter (1928); No. 54, Pollution of Boundary Waters (1946); No. 55, Pollution of Boundary Waters from Lake Erie, Lake Ontario-Waters of Niagara River (1948); No. 61, Smoke Abatement Investigation (1949); No. 71, St. Croix River (1955); No. 73, Pollution of Rainy River and Lake of the Woods (1959); No. 81, Pollution of the Red River (of the North) (1964); No. 83, Pollution of Lake Erie, Lake Ontario, and International Section of the St. Lawrence River (1964); No. 85, Air Pollution (1966). The St. Croix River reference (Doc. No. 71) was not by its terms a pollution reference, but since the IJC dealt with basin pollution problems in some detail, I have included it in the subsequent discussion.

80. Pollution of Boundary Waters, IJC Doc. No. 4 (1912).

81. IJC, FINAL REPORT ON THE POLLUTION OF BOUNDARY WATERS REFERENCE (1918).

everywhere perilous, and in some cases disgraceful."⁸² Pollution was "very intense along the shores of the Detroit and Niagara Rivers" and "conditions exist[ed] which imperil[ed] the health and welfare of the citizens of both countries in direct contravention of the treaty."⁸³ To deal with this situation, the IJC recommended that the two governments confer jurisdiction upon the Commission to regulate and prohibit such transboundary pollution. The governments accepted the report and requested the IJC to prepare reciprocal legislation or a draft convention for this purpose.

The IJC submitted a draft convention in October 1920.⁸⁴ In view of the current proposed Agreement, some history of this early effort may be of interest. In submitting the draft convention, the IJC stated that it was

firmly of the view that the method best adapted to avoid the evils which the Treaty is designed to correct is to take proper steps to prevent dangerous pollution crossing the boundary line rather than to wait until it is manifest that such pollution has actually physically crossed, to the injury of health or property on the other side; and that to this end the Convention should clothe the Commission with authority and power, subject to all proper limitation and restrictions, to make such orders, rules and regulations . . . as may be proper and necessary to maintain boundary waters in as healthful a condition as practicable in view of conditions already created, and should contain proper provisions for the enforcement of such orders, rules and directions.⁸⁵

Under the draft convention, the Commission would have been given authority to investigate any alleged violation of Article IV of the Treaty and to report its findings to the governments. On the basis of the Commission's findings of fact, which were to be "final and conclusive," the governments would have been obligated to take such measures as might be necessary to prevent a continuation of the breach. The Commission would also have been given authority to define classes of vessels "in which apparatus for the disinfection of the sewage, bilge-water or water ballast discharged therefrom should be installed to prevent the pollution of waters,"⁸⁶ and the parties could not have granted licenses to vessels that failed to meet IJC requirements. Finally, the parties would have agreed to enact or

82. *Id.* at 31.

83. *Id.* at 51, quoted in IJC LOWER LAKES REPORT, *supra* note 10, at 2.

84. Draft Convention of October 6, 1920, on file with the *Michigan Law Review*.

85. Letter accompanying Draft Convention, *supra* note 84, at 5, on file with the *Michigan Law Review*.

86. Draft Convention, *supra* note 84, art. V.

recommend legislation for full enforcement of the convention. The draft convention was discussed by the governments, but they were unable to reach agreement and negotiations terminated in 1929.⁸⁷ Apparently, one obstacle was the objection of the United States to the provision that the Commission's findings of fact regarding the existence of pollution and its injurious nature would be final.⁸⁸ Canada attempted to reopen the negotiations in 1942, but the State Department took the position that the time was not propitious.⁸⁹ Many years were to pass before the governments were again to consider an expansion of the IJC's formal authority,⁹⁰ and even then the proposal was framed in much less sweeping terms than in the Commission's 1920 draft.

The IJC's activities regarding pollution were limited during the interwar years. However, the Commission did play a role in the famous *Trail Smelter* arbitration,⁹¹ a landmark case in the development of pollution law. In 1928 a reference was filed by the United States and concurred in by Canada concerning the extent to which property in the State of Washington had been damaged by fumes drifting from a smelter located at Trail, British Columbia; the amount of indemnity to compensate for past damage caused by such fumes; the probable effects of future operations of the smelter on the State of Washington; and the method of providing indemnity for any future damages. In its report of February 28, 1931, the IJC recommended payment of \$350,000 to cover damages sustained in the State of Washington by reason of the operation of the Trail Smelter to the end of 1931.⁹² The two governments decided to entrust the remaining aspects of this problem to a special tribunal and under the terms of a 1935 convention⁹³ established an ad hoc arbitral tribunal to determine, *inter alia*, whether further damage had been caused in the State of Washington by the Trail Smelter subsequent to January 1, 1932, and, if so, the amount of that damage. In its decision, reported to the two governments on April 16, 1938, the arbitral tribunal concluded that damage had indeed been caused

87. See D. PIPER, *supra* note 10, at 86; 3 M. WHITEMAN, *supra* note 28, at 828-29.

88. See D. PIPER, *supra* note 10, at 86.

89. *Id.*

90. See pt. II. D. *infra*.

91. Trail Smelter, IJC Doc. No. 25 (1928).

92. See 3 M. WHITEMAN, *supra* note 28, at 789.

93. Convention with the Dominion of Canada Relative to the Establishment of a Tribunal To Decide Questions of Indemnity and Future Regime Arising from the Operation of Smelter at Trail, British Columbia, April 15, 1935, 49 Stat. 3245 (1935), T.S. No. 893 (effective Aug. 7, 1935).

between January 1932 and October 1937, and that an indemnity of \$78,000 with interest should be paid.⁹⁴ In its final decision, reported March 11, 1941, the tribunal concluded that no damage had occurred since 1937, but recommended a "prescribed regime to avoid future damage."⁹⁵ In the course of its opinion, the tribunal made what is still the broadest judicial suggestion of international liability for transnational pollution:

[U]nder 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 property or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.⁹⁶

Following the Second World War, the problem of pollution of boundary waters, as well as other transboundary pollution problems, assumed a position of increasing importance in the two countries. In view of the provisions of Article IV of the 1909 Treaty and the expertise and patterns of United States-Canadian cooperation already developed by the IJC, it is not surprising that the two governments turned increasingly to the Commission in an effort to deal with these problems.

In 1946 the two governments requested that the IJC investigate problems arising from pollution in the St. Clair River, Lake St. Clair, the Detroit River, and the St. Marys River—the so-called *Connecting Channels Reference*.⁹⁷ A further reference was submitted in 1948 to include the Niagara River as well,⁹⁸ and the two references were thereafter administered as one. The Commission's 312-page report on the *Connecting Channels Reference*,⁹⁹ submitted on October 11, 1950, constituted a major advance in international pollution control experience in terms of both its technical comprehensiveness and the nature of its recommendations. The report disclosed serious pollu-

94. Trail Smelter Arbitration (United States v. Canada), 3 U.N.R.I.A.A. 1911 (1949), 33 AM. J. INTL. L. 182 (1938).

95. Trail Smelter Arbitration (United States v. Canada), 3 U.N.R.I.A.A. 1938 (1949), 35 AM. J. INTL. L. 684 (1941).

96. Trail Smelter Arbitration (United States v. Canada), 3 U.N.R.I.A.A. 1965 (1949), 35 AM. J. INTL. L. 716 (1941). Since Canada had accepted liability by the terms of the arbitral agreement, the statement is technically dictum. The history of the arbitration is well covered and the decisions analyzed in Read, *The Trail Smelter Dispute*, 1 CAN. Y.B. INTL. L. 213 (1963); Rubin, *Pollution by Analogy: The Trail Smelter Arbitration*, 50 ORE. L. REV. 259 (1971).

97. IJC Doc. No. 54 (1946).

98. Pollution of Boundary Waters from Lake Erie, Lake Ontario-Waters of Niagara River, IJC Doc. No. 55 (1948).

99. IJC, REPORT ON THE POLLUTION OF BOUNDARY WATERS (1951).

tion in the various connecting channels, which resulted principally from the discharge of domestic sewage and industrial wastes and which, the Commission suggested, required urgent action. As a method of dealing with the problem the Commission recommended adoption by the two governments of a number of specific "Objectives for Boundary Water Quality Control." In essence, these objectives were technical criteria to be met in order to maintain the waters in a satisfactory condition. The idea of recommending technical water quality objectives was a major innovation, which the Commission has followed in subsequent pollution references. The objectives, which were the first of their kind to be formulated on an international basis, anticipated national action in both countries;¹⁰⁰ the concept was ultimately embodied in the federal Water Quality Act of 1965¹⁰¹ fifteen years later. The Commission also recommended appointment of two advisory boards on control of pollution—one for the Superior-Huron-Erie section connecting channels and the other for the Erie-Ontario section connecting channels. The boards were to assist the Commission in surveillance of the connecting channels to ensure compliance with the recommended objectives, notifying those responsible for objectionable pollution, and, in the absence of corrective measures, making appropriate recommendations to authorities having jurisdiction. Again, it has now become standard practice for the Commission to recommend that an advisory board be established to maintain surveillance on developments surrounding a particular reference. The Connecting Channels Report was approved by the governments, and the two boards were established and have since functioned continuously. A program of periodic conferences with interested persons was also commenced to assist in promoting compliance, and this practice has also continued.

In 1949 the IJC was asked to investigate the contribution made by vessels on the Detroit River to atmospheric pollution in the Detroit-Windsor area.¹⁰² The Commission established a technical board on atmospheric pollution to conduct the investigations. The IJC's report, issued May 31, 1960, found serious air pollution on both sides of the river causing health and economic injuries.¹⁰³ The Commission concluded, however, that the major sources of atmospheric pollution were industrial and transportation activities in the

100. IJC LOWER LAKES REPORT, *supra* note 10, at 4.

101. 33 U.S.C. §§ 1151-75 (1970).

102. Smoke Abatement Investigation, IJC Doc. No. 61 (1949).

103. IJC, REPORT ON THE POLLUTION OF THE ATMOSPHERE IN THE DETROIT RIVER AREA (1960).

surrounding land areas and that fumes from vessels contributed only a minimal amount to this pollution. It recommended that the governments adopt certain regulations for the emission of smoke from vessels and concluded that for other sources there was already adequate legal and administrative authority in each country to enforce proper controls on emission of wastes into the atmosphere. On January 30, 1961, the governments authorized the IJC to continue its surveillance program pending communication of the views of the governments on the report. An advisory board has been established and its work continues.

On June 10, 1955, the two governments submitted a reference to the IJC requesting it to investigate and study redevelopment of the St. Croix River Basin for the purpose of the improvement of the use, conservation, and regulation of the waters of the basin.¹⁰⁴ While the reference did not expressly refer to pollution the Commission dealt with that subject extensively. The Commission established the International St. Croix River Engineering Board to conduct the investigation. In 1957 the Engineering Board completed a preliminary report and on October 13, 1959, the Commission reported to the two governments on the regulation and pollution of the waters of the Basin.¹⁰⁵ The report recommended, *inter alia*, that the "Objectives for Boundary Waters Quality Control," which were set forth in the Commission's Report on the Pollution of Boundary Waters (the Connecting Channels Report) be adopted by the governments of Canada, the United States, New Brunswick, and Maine as the criteria to be met in maintaining the Basin Waters in satisfactory condition; that those responsible for existing or potential pollution put into effect remedial measures necessary to meet these "Objectives"; and that the Commission be authorized to establish and maintain supervision over boundary waters pollution problems in the Basin through a technical advisory board. On October 2, 1961, the governments announced that they had approved the recommendations of the Commission, with an exception not here pertinent. The advisory board was established and is presently functioning.

In May 1959 the two governments submitted a reference to the IJC concerning pollution of Rainy River and the Lake of the Woods.¹⁰⁶ The Commission established a technical board on water

104. St. Croix River, IJC Doc. No. 71 (1955).

105. IJC, REPORT ON THE DEVELOPMENT OF THE WATER RESOURCES OF THE ST. CROIX RIVER BASIN (1959).

106. IJC Doc. No. 73 (1959).

pollution, which submitted a comprehensive report to the Commission on April 4, 1963. The Commission issued its report in February 1965, which concluded that the waters of the Rainy River were being seriously polluted, primarily by the discharge of wastes from pulp and paper industries, but that the water quality of Lake of the Woods appeared satisfactory.¹⁰⁷ It recommended that the concerned state and provincial governments adopt specified water quality objectives for the Rainy River; that appropriate authorities require the industries and municipalities concerned to initiate, at the earliest possible date and pursuant to a definite time schedule, construction of pollution abatement facilities; and that the Commission be authorized to establish and maintain supervision over pollution of the waters of the Rainy River. The report was accepted by the governments and a supervisory board established.

In October 1964, in the only pollution reference concerning a river that was not a boundary water, the two governments requested the IJC to investigate pollution of the Red River.¹⁰⁸ The Commission created the International Red River Pollution Board to undertake the necessary technical investigations and studies, and the Board submitted a two-volume report in October 1967. In its final report, submitted in April 1968,¹⁰⁹ the Commission concluded that during the survey period the river waters crossing the boundary were not polluted to an extent that caused injury to health or property in Canada, and that injury was unlikely to occur if standards established pursuant to legislation in Minnesota and North Dakota were adhered to in those states. It further concluded that to ensure maintenance of satisfactory water quality conditions at the boundary it was necessary to adopt mutually acceptable water quality objectives for the Red River at the international boundary and to provide for continuous supervision to assure compliance with such objectives. Accordingly, the IJC recommended general and specific water quality objectives for the area and the establishment of an international board to maintain supervision. These recommendations were accepted and the board established.

Also in October 1964, in one of the most significant and broad-ranging postwar pollution references, the two governments requested that the IJC inquire into the extent, causes, and location of pollution of Lake Erie, Lake Ontario, and the International Section of the St.

107. IJC, REPORT ON THE POLLUTION OF RAINY RIVER AND LAKE OF THE WOODS (1965).

108. IJC Doc. No. 81 (1964).

109. IJC, REPORT ON THE POLLUTION OF THE RED RIVER (1968).

Lawrence River—the so-called *Lower Great Lakes Pollution Reference*.¹¹⁰ The Commission established two international technical advisory boards, the International Lake Erie Water Pollution Board and the International Lake Ontario-St. Lawrence Water Pollution Board, to conduct the technical investigations. The Boards' investigation was the most extensive water pollution study to be undertaken anywhere to date, involving the concerted efforts of twelve agencies of the two national governments, the states of New York, Pennsylvania, Ohio, and Michigan, and the Province of Ontario, and the work of several hundred scientific, engineering, and technical experts from a variety of disciplines.¹¹¹ During the period from 1964 to 1970 the Boards submitted 10 semiannual progress reports and two interim reports to the IJC.¹¹² The IJC itself made three interim reports to the two governments. In September 1969 the Boards submitted to the Commission a comprehensive 800-page joint final report on the subject of the reference, containing detailed technical findings and a wide variety of recommendations.¹¹³ During the period of December 1969 through February 1970 the IJC held six hearings on this report in eight United States and Canadian cities. On January 14, 1971, the IJC issued its own final report to the two governments¹¹⁴ which adopted most of the Board's recommendations.¹¹⁵ These recommendations, which were to play a crucial role in the proposal and negotiation of the proposed Agreement, will be described later in greater detail.¹¹⁶

On September 23, 1966, the governments expanded upon the 1949 Detroit River air pollution reference by requesting the IJC to

110. IJC Doc. No. 83 (1964). See also Dept. of State Press Release No. 441 (Oct. 8, 1964). The reference is reprinted in full in the IJC LOWER LAKES REPORT, *supra* note 10, at 161-62. The Commission's procedures and method of work with respect to this reference are set out in detail in IJC LOWER LAKES REPORT, *supra* note 10, at 1-6, 25-33.

111. IJC LOWER LAKES REPORT, *supra* note 10, at 25. The Board's multimillion dollar investigation required nearly 450 man years of work by scientists, engineers, and technical experts. The offshore studies involved over 100 cruises on Lake Erie and 200 on Lake Ontario to obtain water samples on a regular basis and to retrieve data at 13,000 stations. The Ontario Water Resources Commission alone deployed as many as 12 survey vessels to collect data at 50,000 sampling locations. In all, 600,000 samples were analyzed for various constituents. *Id.* at 26-27.

112. See, e.g., International Great Lakes Levels Bd., Interim Report to the IJC: Regulation of Great Lakes Levels, Feb. 1968.

113. International Lake Erie Water Pollution Bd. & International Lake Ontario-St. Lawrence River Water Pollution Bd., Report to the IJC on Pollution of Lake Erie, Lake Ontario and the International Section of the St. Lawrence River, Sept. 1969 (3 vols.).

114. IJC LOWER LAKES REPORT, *supra* note 10. The Report is summarized in 64 DEPT. STATE BULL. 203 (1971).

115. IJC LOWER LAKES REPORT, *supra* note 10, at 149-57.

116. See text accompanying notes 125-29 *infra*.

ascertain whether the air in the Port Huron, Michigan-Sarnia, Ontario, and Detroit, Michigan-Windsor, Ontario vicinities was being polluted on either side of the boundary to an extent that was detrimental to the public health, safety, or general welfare of citizens or property on the other side of the boundary.¹¹⁷ If this question were answered in the affirmative, the Commission was to indicate the sources and extent of the air pollution and to recommend to the governments the most practical preventive or remedial measures. This reference also authorized the IJC to call the attention of the governments to any air pollution situation along the entire boundary meriting concern.¹¹⁸ The Commission assigned this study to its existing International St. Clair-Detroit Air Pollution Board.

On February 4, 1971, the Board submitted a report to the Commission.¹¹⁹ The report concluded that the transboundary flow of air pollutants produces pollution levels that are in excess of the air quality standards established in Ontario and about to be established in Michigan. In the Detroit-Windsor area far more sulfur oxides and particulate matter are being transported from the United States into Canada than are carried in the opposite direction. In the Sarnia-Port Huron area the contribution of sulfur oxides and particulate matter from each country to transboundary air pollution is approximately equal; however, odors that have long been a source of complaint by residents in the Port Huron area are considered in the Board report to be a mixture caused by petroleum refining and petroleum-related organic chemical manufacturing in Sarnia. The report recommends that the responsible control agencies in both countries accelerate abatement programs to bring all sources of air pollution into compliance; that both countries and their respective air pollution control agencies establish uniform air quality standards as soon as possible; and that the governments of Canada, the United States, the State of Michigan, and the Province of Ontario cooperate to control transboundary air pollution from existing sources and to prevent creation of new sources. At the time of this writing, a final report on this reference is reportedly in preparation.

117. Air Pollution, IJC Doc. No. 85 (1966).

118. The penultimate paragraph of the reference states:

The Commission is also requested to take note of air pollution problems in boundary areas other than those referred to in Question I [the vicinity of Port Huron-Sarnia and Detroit-Windsor] which may come to its attention from any source. If at any time the Commission considers it appropriate to do so, the Commission is invited to draw such problems to the attention of both governments.

119. Joint Air Pollution Study of St. Clair-Detroit River Areas for International Joint Commission, Canada and the United States, Jan. 1971.

Following the Santa Barbara Channel oil pollution incident off the coast of California in the winter of 1969,¹²⁰ the two governments became concerned with the situation in Lake Erie, where some oil and gas exploration has been carried on in Canadian waters since 1913. In March 1969 the governments requested the IJC, within the framework of its existing study of Lower Lakes pollution and as a matter of urgency, to investigate and make a special report on the adequacy of existing safety requirements applicable to underwater drilling and production operations to prevent oil from spilling into Lake Erie; the adequacy of known methods of clearing up any major oil spill that may occur from any source; and the adequacy of existing contingency plans in both countries for dealing with oil spills.¹²¹ The Commission instructed its existing International Lake Erie Water Pollution Board to carry out the technical investigation. Five months later the Board issued a report¹²² concluding that the current regulations of Ontario, New York, and Pennsylvania pertaining to oil and gas exploration and production are adequate and if effectively enforced would provide satisfactory protection for the water resources of the Lake. It further found that while oil and gas exploration and development is a potential source of oil pollution in Lake Erie, other potential sources might pose a greater threat. It pointed out that the daily discharge of oil to the Detroit and St. Clair Rivers exceeds the peak daily flow that escaped from the well off Santa Barbara and that possibly the greatest threat to the water resources of the Lake is the significant amount of oil carried in ships for their own use, on the average 1,000 tons per vessel, as well as the oil and other hazardous cargoes carried by some ships. The Board carefully examined technical aspects of containment and clean-up of major oil spills and existing contingency plans in both countries and emphasized the urgent need for international coordination and cooperation to set up procedures to deal effectively with a major oil spill. It recommended an accelerated and expanded program for containment and clean-up of oil spills; the development of a coordinated international contingency plan and more complete national contingency plans; the temporary limitation of drilling and production in certain parts of Lake Erie pending development of such plans and programs;

120. See, e.g., N.Y. Times, Jan. 31, 1969, at 50, col. 3.

121. The text of the request is set forth in the IJC LOWER LAKES REPORT, *supra* note 10, at 163-64. The U.S. letter, which is identical to the Canadian letter, is reprinted in 60 DEPT. STATE BULL. 296 (1969).

122. International Lake Erie Water Pollution Bd., Report to the IJC on Potential Oil Pollution Incidents from Oil and Gas Well Activities in Lake Erie: Their Prevention and Control, Sept. 1969.

the exclusion from the Great Lakes of ships and masters likely to present unreasonable risks of oil pollution; and provisions to alert appropriate officials when hazardous materials are in transit over Lake waters.

The Commission held public hearings on the Board's report in December 1969. On May 21, 1970, the IJC submitted to the two governments its third interim report on the progress of its Lower Lakes study. The report, entitled "Special Report on Potential Oil Pollution, Eutrophication, and Pollution from Watercraft," adopted, *inter alia*, most of the conclusions of the Board with respect to the oil pollution question.¹²³ The Commission's interim conclusions were subsequently confirmed in its January 1971 final Report on the Lower Great Lakes Pollution Reference.¹²⁴

This survey may be concluded by returning to a fuller description of the final Report on the Lower Great Lakes Pollution Reference, perhaps the most important reference on the topic of pollution. Briefly stated, the questions posed to the Commission in the reference were as follows:

1. Were the boundary waters of Lake Erie, Lake Ontario, and the international section of the St. Lawrence River being polluted on either side to an extent injurious to health or property on the other side?
2. If so, to what extent, by what causes, and in what localities was such pollution taking place?
3. What remedial measures would be the most practical from economic, sanitary, and other points of view, and what would the probable cost of these measures be?¹²⁵

The IJC's Report is extremely comprehensive. It contains an extensive discussion, based on the Joint Boards' technical studies, of all aspects of the Lower Great Lakes pollution problems; a number of specific conclusions; a listing of both general and specific proposed water quality objectives; and twenty-two specific recommendations for action by the two governments and responsible jurisdictions in both countries.

In response to the particular questions posed, the Commission found that the waters of the Lower Great Lakes are being seriously polluted on both sides of the boundary to the detriment of both countries. While it is difficult to establish positively that the concentration of a particular pollutant on one side of the boundary is due

123. The report is summarized in 62 DEPT. STATE BULL. 807 (1970).

124. IJC LOWER LAKES REPORT, *supra* note 10, at 52-61.

125. *Id.* at 5. The full reference is reprinted in *id.* at 161-62.

to a specific source on the other side, there is no doubt that contaminants originating in one country do move across the boundary and degrade the quality of water in the other country to the extent of causing injury to health and property on that side of the boundary.

In answer to the second question, the Commission found that water pollution extends throughout the Lower Lakes; that the principal causes are wastes discharged into the boundary waters and tributaries by municipalities and industries; and that pollution is taking place in all jurisdictions sharing the boundary waters. It found that Lake Erie, particularly its western basin, is in an advanced state of eutrophication, or aging, and that accelerated eutrophication is occurring in Lake Ontario. A controlling factor in this process is the discharge of phosphorus from detergents and other municipal and industrial wastes.

Finally, in answer to the third question, and as a result of its previous answers, the Commission found that urgent measures are required, and it recommended that both Canada and the United States adopt specific water quality objectives—as set out in the Report—and enter into agreement on a wide range of programs, measures, and schedules to achieve them. The Report lists specific remedial actions to be taken on an urgent basis, including immediate reduction of the phosphorus content in detergents and the prompt implementation of a vigorous program to treat municipal and industrial waste to reduce phosphorus inputs. Estimated cost in terms of 1968 dollars for municipal and industrial treatment facilities in Canada is 211 million dollars and in the United States 1,373 million dollars.¹²⁶ The Commission recommends that, until it is in a position to recommend quality objectives for Lake Huron and Lake Superior, the states of Michigan, Wisconsin, and Minnesota, and the Province of Ontario recognize the objectives recommended for the Lower Lakes as the initial basis for the establishment of water pollution control programs for the Upper Lakes.

The Commission Report, however, is not limited to technical evaluations and recommendations. It also deals extensively with the surveillance, monitoring, and implementation required to achieve the recommended remedial measures,¹²⁷ and, to this end, concludes by recommending a substantial expansion of its own authority and jurisdiction. Recommendation 20 urges that the two governments extend, at the earliest practicable date, the existing Lower Lakes

126. *Id.* at 137-38.

127. *Id.* at 130-35.

Reference to authorize the Commission to investigate pollution in the remaining boundary waters of the Great Lakes system and the waters tributary thereto.¹²⁸ The final recommendation of the Report is more far-reaching. The Commission recommends that

The Governments of Canada and the United States specifically confer upon this Commission the authority, responsibility and means for coordination, surveillance, monitoring, implementation, reporting, making recommendations to governments all as outlined in Chapter XIII of this Report [which contains a detailed discussion of needs respecting surveillance, monitoring, and implementation], and such other duties related to preservation and improvement of the quality of the Great Lakes-St. Lawrence System as may be agreed by the said Governments; the Commission to be authorized to establish, in consultation with the Governments, an international board or boards to assist it in carrying out these duties and to delegate to said board or boards such authority and responsibility as the Commission may deem appropriate.¹²⁹

D. *The Proposed Great Lakes Water Quality Agreement*

The completion in September 1969 of the two Lower Lakes technical boards' intensive study of Lower Great Lakes pollution, and the boards' strong conclusions and recommendations to the IJC concerning the grave deterioration of water quality in many areas of the Lakes, coincided with several factors that surely aided their effectiveness: a surge of public anxiety over environmental problems in both the United States and Canada, public demands in both countries for government action to deal with these problems, and strong international pressures by the Canadian government upon the United States government for the adoption of more effective measures to cope with Great Lakes pollution. Influenced no doubt by all these factors, President Nixon charged the Council on Environmental Quality to work with Canada on this matter.¹³⁰

On June 23, 1970, the two governments convened a high level ministerial meeting in Ottawa to discuss common Great Lakes pollution problems.¹³¹ The Canadian delegation was led by Mitchell Sharp and the American delegation by Russell Train. Both delegations included state and provincial as well as federal officials and representatives. At the conclusion of the initial meeting the

128. *Id.* at 155.

129. *Id.* at 156.

130. Information based on interviews with U.S. government officials.

131. See Dept. State Press Release No. 189 (June 23, 1970) (Communique of the Canada-United States Ministerial Meeting on Great Lakes Pollution), published in 63 DEPT. STATE BULL. 36 (1970).

Ministers expressed deep concern about the critical situation in the Great Lakes, noted the determination of the governments to take decisive action, and agreed on a number of specific remedial measures.¹³² The Ministers further agreed to the establishment of a joint Working Group, composed of representatives of federal, state, and provincial agencies with responsibilities in the field of water quality, to consider various aspects of the problems of Great Lakes pollution, possible common water quality objectives, and such implementing programs as either government might wish to propose. The Working Group was charged to report back to the Ministerial Conference, which would be reconvened subsequent to the IJC's issuance of its final Report on the Lower Great Lakes Pollution Reference.¹³³

The Working Group divided into ten subgroups, each dealing with particular aspects of the Great Lakes problem. The reports of the subgroups were presented to the full Working Group in February and March 1971, and the final report of the Working Group was approved by the full Group in April 1971 and presented to the Ministerial Meeting in June 1971.¹³⁴ The central recommendation of the Working Group report was that the United States and Canada enter into a comprehensive new agreement on Great Lakes water quality control and that the agreement should include adoption of common water quality objectives for the Great Lakes, programs for achieving these objectives, and an expansion of the IJC's authority to permit it to monitor effectively these efforts.

On June 10, 1971, the Ministerial Conference reconvened in Washington to review the Working Group's report. The result of that meeting was broad acceptance of the Working Group's major recommendations, including its proposal for a new agreement on Great Lakes water quality control. A Joint Communique was issued at the conclusion of that meeting committing the two governments to conclude such an agreement.¹³⁵

The details of the proposed Agreement are still in the process of negotiation by the two governments. However, the general character and coverage of the proposed Agreement and associated arrangements are spelled out at some length in the Joint Communique, and at

132. *Id.* The agreed measures included coordination of national contingency plans for spills of oil and hazardous materials, reduction of inputs of phosphates into the Lakes, and achievement of compatible regulations concerning waste disposal by commercial vessels and watercraft.

133. *Id.*

134. Information supplied by U.S. government officials.

135. Joint Communique, *supra* note 1.

least some of the probable details may be surmised from the recommendations in the IJC's Report and other sources.¹³⁶

The Agreement will be a formal and binding international agreement, which will, however, reportedly be entered into by the United States as an executive agreement rather than as a treaty ratified pursuant to formal constitutional processes.¹³⁷ It will presumably first establish certain broad general objectives for water quality throughout the boundary waters of the Great Lakes system. These will probably conform closely to the general objectives stated in the IJC's Report and will include, for example, such objectives as keeping the waters free from substances in concentrations that are toxic or harmful to human, animal, or aquatic life; free from nutrients in concentrations that create nuisance growths of aquatic weeds or algae; and free from floating debris or other materials in amounts sufficient to be deleterious or objectionable.¹³⁸

To achieve these general objectives, the parties will agree to adopt specific common water quality objectives,¹³⁹ perhaps with associated target loadings and target dates, applicable to specific areas. Most likely, these specific water quality objectives will again be essentially the same as those recommended by the IJC in its Report; these suggest specific technical criteria for the quality of the receiving waters with regard to microbiology, dissolved oxygen, total dissolved solids, temperature, taste and odor, pH, iron, phosphorus, radioactivity, and, as required, toxic materials, oils, and heavy metals.¹⁴⁰ Presumably there will be some arrangement under which these

136. See, e.g., OCEAN SCIENCE NEWS, Sept. 10, 1971, at 1, which reports that the heart of the Agreement will be contained in nine annexes dealing with water quality objectives, contingency plans, vessel construction, vessel wastes, a navigation study, dredged spoils, onshore and offshore facilities, transportation by land, and coordination of research. It also notes that the 1975 target date for implementation of objectives will be set back to 1976 and that among the differences remaining to be negotiated is the fact that, while Canada wants a definite financial commitment from the U.S. for setting up the Joint Water Quality Board under the IJC, the U.S. must anticipate variations in the funds that will be approved by the House Appropriations Committee, whose Chairman, Representative John Rooney, has not reacted favorably to IJC funding requests.

137. The proposed Agreement will presumably be an "umbrella-type" arrangement in that it will commit each government to use the legislative and regulatory powers available to it from time to time to take action to control pollution. Thus, the initial U.S. programs will not require additional legislation, but, with enactment of new legislation, the U.S. will be able to expand such programs. (Information supplied by U.S. government officials.)

138. See IJC LOWER LAKES REPORT, *supra* note 10, at 144-45, set out in note 191 *infra*.

139. Joint Communique, *supra* note 1, ¶ 5.

140. See IJC LOWER LAKES REPORT, *supra* note 10, at 145-48, set out in part in note 192 *infra*.

objectives, loadings, and dates may be supplemented or modified from time to time under agreed procedures without the necessity for revising the Agreement as a whole.

To meet these specific objectives, each party will undertake to establish, through its own legal procedures, a broad range of national water quality standards for the boundary waters of the Great Lakes system; these standards must be compatible with and, it is hoped, may exceed the common water quality objectives set forth in the Agreement.¹⁴¹

As a further measure to achieve the common water quality objectives, the two governments will exchange commitments to carry out a variety of pollution control programs within agreed time periods, or as rapidly as feasible, including:

- (a) construction of treatment facilities for municipal and industrial wastes and animal husbandry operations, (b) reduction of phosphorus discharges, (c) elimination of mercury and other toxic metals from discharges, (d) control of thermal pollution, (e) control of pollution from radioactive wastes, (f) control of pollution from pesticides, and (g) development of controls for pollution from combined sewer overflows.¹⁴²

The two governments will also agree to effective and compatible regulations "(a) for ship design and construction to prevent fuel and cargo loss, (b) for control of vessel waste discharges, (c) for disposition of polluted dredge spoils, and (d) for preventing discharges of oil and hazardous polluting substances from on- and off-shore facilities and transportation on land."¹⁴³ The Agreement will also provide for a joint investigation by the two governments for the purpose of agreeing upon measures respecting new navigation equipment, establishing traffic lanes on the Lakes, and the manning and operating of vessels.¹⁴⁴ The Communique also announces that, without waiting for the negotiation of the Agreement, the governments are proceeding immediately with certain additional measures, including "a joint contingency plan for a coordinated response to pollution incidents involving spills of oil and other hazardous materials" on the Great Lakes.¹⁴⁵

The Communique expresses the two governments' agreement

141. Joint Communique, *supra* note 1, ¶ 5.

142. *Id.*

143. *Id.*, ¶ 7.

144. *Id.*, ¶ 8.

145. *Id.*, ¶ 13.

that they should assign additional responsibilities and authority to the IJC to assist the governments in their efforts to restore and protect Great Lakes water quality and gives considerable emphasis to the enhanced role envisioned for the Commission.¹⁴⁶ More specifically, the Commission will be given a greater role in collecting, analyzing, and disseminating relevant data and information; surveillance of water quality in the Great Lakes system; monitoring of the effectiveness of governmental programs to achieve the common water quality objectives; coordinating activities to improve water quality; tendering advice and assistance; and recommending legislation and programs.¹⁴⁷ Arrangements will be established within the IJC for the coordination of water quality research. Presumably the IJC will render regular reports on progress made under the Agreement. The Communique also states that the governments intend to extend new references to the IJC, requesting it (a) to conduct an investigation of water quality in Lake Superior and Lake Huron and (b) to extend its surveillance of water quality to Lake Huron and Lake Superior.¹⁴⁸ A separate reference may provide for a study by the IJC of pollution from agriculture, forestry, and other land sources.

The Communique also addresses the question of IJC institutional arrangements to carry out these new responsibilities.¹⁴⁹ The two governments agreed that it will be necessary to provide the Commission additional staff and resources; the new appointments will be the Commission's responsibility, although the governments will be consulted. The establishment of an IJC office in the Great Lakes area is suggested. The Ministers further suggest establishment of a special pollution advisory board under the Commission to assist in implementing the new Agreement; it is also suggested that subboards might be created to deal with specific functional responsibilities and specific geographical areas within the Great Lakes basin. The pollution advisory board or boards should have a balanced binational membership. The Communique makes clear, however, that the two governments do not intend to grant the Commission any specific enforcement authority. While the Commission is to aid the governments by providing an independent overview and other assistance, the various agencies of the federal, state, and provincial governments will

146. *Id.*, ¶ 9.

147. *Id.* The authority contemplated is presumably a reflection of the arrangements for surveillance, monitoring, and implementation suggested and more fully discussed in IJC LOWER LAKES REPORT, *supra* note 10, at 130-35.

148. Joint Communique, *supra* note 1, ¶ 13.

149. *Id.*, ¶¶ 10-11.

continue to implement the programs and measures required to achieve the water quality objectives.¹⁵⁰

In the Joint Communique, each government addressed itself briefly to certain domestic measures that it was already undertaking to meet these problems and various related issues.¹⁵¹ American representatives reviewed the extensive federal programs directed toward remedying Great Lakes pollution that were underway. The Canadian Ministers indicated the desirability of a 1975 deadline for completion of certain of the proposed Lower Great Lakes programs, particularly those directed to the reduction of phosphorus inputs. They also noted that implementation of many of the Canadian commitments under the proposed agreement will be the joint responsibility of the Canadian federal government and the government of Ontario and that the apportionment of responsibility among the Canadian government, the government of Ontario, and the municipalities concerned for the financing of the required accelerated program of improvements to municipal sewage treatment facilities in the Lower Lakes area will be the subject of a detailed agreement to be negotiated between the Canadian government and the government of Ontario.

Both groups of Ministers expressed in the Communique their optimism for the future. But in a significant note of caution they added: "In designing the agreement, it was accepted that programs and other measures established to meet urgent problems would in no way affect the rights of each country in the use of its Great Lakes waters."¹⁵² In an interesting conclusion to the substantive part of the Communique, the Ministers noted that the process of intergovernmental cooperation employed in designing the proposed Agreement might be applied to the solution of other common environmental problems—for example, air pollution.¹⁵³ Finally, it should be noted that the Communique makes no mention of any special procedures for dispute-settlement for use in the case of claims of noncompliance with the proposed Agreement. Presumably, such claims will be dealt with under the dispute-settlement provisions of the 1909 Treaty.

III. SOME ASPECTS OF THE UNITED STATES-CANADIAN EXPERIENCE

While every international environmental arrangement is necessarily unique, there are certain common problems that the parties will face in reaching any agreement. These include the initial de-

150. *Id.*, ¶ 12.

151. *Id.*, ¶¶ 13-18.

152. *Id.*, ¶ 17.

153. *Id.*, ¶ 18.

cision that a particular environmental problem or set of problems is an appropriate subject for international treatment; the determination of the form any international cooperation should take; the structuring of required institutions; the determination of objectives; the apportionment of burdens; the establishment of coordination; and the formulation of provisions for implementation. It may be useful to take a closer look at how the United States and Canada have dealt with these problems.

A. *The Need for International Cooperation*

A threshold stage of any arrangement for international environmental cooperation is a recognition by governments that the particular problems involved are appropriate matters for international treatment. With a few exceptions,¹⁵⁴ pollution and other environmental problems were long regarded as primarily of national rather than international concern. It is only within the past few years that this view has undergone substantial change and the propriety of broader international involvement in environmental issues has become more widely accepted. Nevertheless, states are still inclined to think of these questions as primarily national in character and, unless they see some national interest that can be pursued through international environmental cooperation, will have little inclination to participate. Thus, with respect to each proposal for international environmental measures, it is useful to ask why such measures are needed and what they can add to approaches based on national action alone.¹⁵⁵ There are at least three types of situations in which international treatment seems generally advisable.

First, the clearest case for international cooperation is the one in which a particular environmental problem both produces significant and potentially harmful international effects and is of such a nature, or manifested in such a context, that measures to deal effectively with it inherently require some type of joint or coordinated international action. The typical case arises where several countries share a river, a lake, or an enclosed sea, or where all nations share an environment beyond the reach of any single national jurisdiction, such as the high seas or outer space. Clearly, pollution problems in these settings cannot be adequately assessed or controlled except through

154. See note 178 *infra*.

155. See generally CEQ 1970 REPORT, *supra* note 7, at 199-200; Russell & Landsberg, *International Environmental Problems: A Taxonomy*, 172 SCIENCE 1307 (1971); Report of the U.N. Secretary General on Problems of the Human Environment, *supra* note 6; authorities cited in note 5 *supra*.

common or joint action by all of the states that are contributing to the problem or sharing control of the relevant environments. Over time a broad consensus has developed favoring international treatment of many of these issues.¹⁵⁶ In the broadest sense, perhaps all environmental problems are of this character because of their ultimate effect on the global environment. Of course, different types of measures may be appropriate to different cases: some situations may suggest only limited programs of exchange of information and data, coordinated or joint monitoring or surveillance, or, as in the case of recent American-Canadian cooperation, the setting of minimum common objectives; other situations may call for more far-reaching techniques of international or supranational regulation or enforcement.

Second, international measures may be useful when a state fails for some reason to control adequately what is primarily its own national environmental problem, with consequent spill-over effects of a type that damage other countries. The passage of fumes from a smelter across an international boundary, as in the *Trail Smelter* arbitration,¹⁵⁷ is an example of such a situation. The type of international measures suggested may vary with the case. Thus, a state may

156. See note 178 *infra*. The principal convention dealing with pollution of the oceans is the International Convention for the Prevention of the Pollution of the Sea by Oil, opened for signature May 12, 1954, [1961] 12 U.S.T. 2989, T.I.A.S. No. 4900, 327 U.N.T.S. 3, as amended April 11, 1962, [1966] 17 U.S.T. 1523, T.I.A.S. No. 6109, 600 U.N.T.S. 332, and 1969 (annexed to IMCO Ass. Res. A.175(VI) (Oct. 21, 1969)). See also Geneva Convention on the High Seas, opened for signature April 29, 1958, [1962] 13 U.S.T. 2312, T.I.A.S. No. 5200, 450 U.N.T.S. 82, art. 24 (oil pollution); art. 25 (pollution by radioactive materials and other harmful agents); Geneva Convention on the Continental Shelf, opened for signature April 29, 1958, [1964] 15 U.S.T. 471, T.I.A.S. No. 5578, 499 U.N.T.S. 311, art. 5(7) (coastal state engaged in exploring or exploiting the resources of the shelf must take appropriate measures for protection of the living resources of the sea from harmful agents); International Convention on Civil Liability for Oil Pollution Damage, opened for signature Nov. 29, 1969, reprinted in 64 AM. J. INTL. L. 481 (1970); International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, opened for signature Nov. 29, 1969, reprinted in 64 AM. J. INTL. L. 471 (1970); Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil, June 9, 1969, between the various states bordering on the North Sea, reprinted in 9 INTL. LEGAL MATERIALS 359 (1969). During the past several years, the U.N. General Assembly has adopted a number of resolutions dealing with various aspects of marine pollution. See generally Hardy, *International Control of Marine Pollution*, 11 NATURAL RESOURCES J. 296 (1971); Schachter & Serwer, *supra* note 5.

Both the Antarctic Treaty, Dec. 1, 1959, [1961] 12 U.S.T. 794, T.I.A.S. No. 4780, 402 U.N.T.S. 71, and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, [1967] 18 U.S.T. 2410, T.I.A.S. No. 6347, contain provisions directed at protecting these unique environments. The Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water, signed at Moscow Aug. 5, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43, was also motivated largely by global environmental considerations.

157. See text accompanying notes 91-96 *supra*.

simply be unaware of the international impact of its environmental policies, in which case international admonitions may alert it to the problem. Or a state may be indifferent to the international environmental consequences of its actions, in which case some type of international persuasion or pressure may be required to induce it to change its attitude. A state may be concerned that, in taking national measures to control pollution, it will be put at an economic or military disadvantage vis-à-vis other states that have similar problems but do not take any corrective action. This situation is illustrated by the current widespread concern regarding the impact of different national environmental quality programs on international trade and investment.¹⁵⁸ Problems of this nature might be met by international measures requiring similar levels of national action by all, or at least most, of the states concerned.¹⁵⁹ Finally, a state may simply not have the financial resources or scientific and technical expertise necessary to develop and maintain required pollution control programs; measures of international financial and technical assistance could help to fill such a gap.

Third, even in cases in which the international impact of particular environmental problems is minimal and in which the national governments are prepared to take necessary action to control them, if the problems are common to various countries, there may be substantial mutual gains to governments from sharing and exchanging relevant scientific data, technology, and institutional experience.

The problem of pollution of the internationally shared environment of the Great Lakes and other United States-Canadian boundary waters is one in which both countries have an obvious common concern and in which the solution can clearly be advanced by international cooperation; indeed, it is perhaps the best example of a situation for which international treatment is appropriate. A major accomplishment of the 1909 Treaty was its early recognition of this

158. See, e.g., CEQ 1971 REPORT, *supra* note 7, at 131-33. The Organization for Economic Cooperation and Development is currently experimenting with techniques for harmonizing environmental standards, as in its introduction, for an initial period of two years, of a "Procedure for Notification and Consultation on Measures for Control of Substances Affecting Man or His Environment," adopted on May 18, 1971, O.E.C.D. Doc. C (71), 73/Annex (1971) (described by Stein, *The Potential of Regional Organizations in Managing Man's Environment*, in LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT, *supra* note 5, manuscript at 15-16).

159. Compare the analogous concept of mutual limitation in the Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water, signed at Moscow Aug. 5, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43. Similar considerations are an important factor in the negotiation of international commodity arrangements. See, e.g., Bilder, *The International Coffee Agreement. A Case History in Negotiation*, 28 LAW & CONTEMP. PROB. 328 (1963).

fact at a time when most other countries with similar problems still regarded pollution as strictly a matter of national concern. By including in the Treaty the provision of Article IV prohibiting pollution, the United States and Canada not only recognized this common concern but established a broad international jurisdictional basis for subsequent joint treatment of environmental problems. Indeed, pollution references under Article IX of the Treaty have traditionally contained language directing the IJC to conduct its investigations "with reference to the principles contained" in Article IV, and it can be assumed that the Preamble to the proposed Agreement will contain a similar direction.

However, while Article IV provides a broad jurisdictional basis for further cooperative efforts between the United States and Canada to implement its prohibition of pollution, it does not in itself require such action. Despite the broad acceptance by both countries of the principle of international concern in Article IV, they have in practice continued to exercise careful control over the extent to which specific boundary waters environmental problems are dealt with on an international basis.

The technique by which the two governments make a particular boundary waters pollution problem the subject of international treatment is submission of a joint reference on the problem to the Commission under Article IX of the Treaty.¹⁶⁰ While unilateral Article IX references are theoretically possible,¹⁶¹ neither government has sought to make a unilateral reference. The suggestion and initiative for particular pollution references may come from various sources—from concerned agencies of the federal, state, or provincial governments of either country; from complaints by affected groups or individuals; or from information brought to the attention of the governments by the Commission itself. The governments have not as yet seen fit broadly to authorize the Commission to institute investigations on its own motion, though on occasion, as in the case of the "watching brief" given the Commission under an air pollution reference, the governments have in effect conferred certain limited investigatory powers.¹⁶² If one of the governments considers a proposed reference too sensitive, it will simply refuse to agree to its submission.

160. The reference procedure is described in text accompanying notes 60-70 *supra*.

161. Article IX provides that questions or matters of differences shall be referred to the IJC for examination and report "whenever *either* the Government of the United States *or* the Government of the Dominion of Canada shall request that such questions or matters of difference be so referred." 1909 Treaty art. IX, first para. (emphasis added).

162. See note 118 *supra* and accompanying text.

In any event, the terms of the reference will be carefully negotiated. Moreover, the Commission's jurisdiction, and thus the scope of international cooperation, is limited by the terms of the reference. The reference procedure permits each country to retain an effective veto over the Commission's investigation, and consequently over the international handling of particular problems; and such vetoes have occasionally been exercised.¹⁶³ The reference procedure is nonetheless important, for, as previously discussed,¹⁶⁴ the history of United States-Canadian Great Lakes cooperation is in effect a history of the various references agreed to by the two governments.

The proposed Agreement and its related arrangements will presumably serve to bring the entire range of Great Lakes problems into the sphere of the IJC's concern and will involve at least limited joint action by the two countries. But the caution and reluctance of the two governments to abandon the prerogatives of sovereignty remain evident. The proposed Agreement will probably provide little in the way of effective international enforcement procedures and the Commission's role in this respect continues to be carefully restricted.

B. *The Role of Legal Prohibitions and Remedies*

One way of attempting to prevent transnational pollution is simply to prohibit it through some operation of international law, with resort by an injured state to the usual processes of international claim and adjudication. One interesting aspect of American-Canadian experience is that, while this technique is expressly available to each country, it has been employed on only one occasion—the *Trail Smelter* arbitration,¹⁶⁵ which dealt with air rather than water pollution. Instead, the two countries have chosen to deal with their common pollution problems through the establishment of ongoing institutional arrangements and cooperative techniques of investigation and assessment, or, more recently under the proposed Agreement, through the establishment of broad cooperative programs and agreed minimum water quality objectives.

As previously noted, the 1909 Treaty contains a specific prohibition on transnational pollution. The relevant provision states that "It is further agreed that the waters herein defined as boundary waters and water flowing across the boundary shall not be polluted

163. For example, Canada has reportedly been reluctant to extend a pollution reference to the Commission concerning pollution of the St. John's River. (Information based on interviews with U.S. government officials.)

164. See pt. II. C. *supra*.

165. See text accompanying notes 91-96 *supra*.

on either side to the injury of health or property on the other."¹⁶⁶ This provision is an early and still significant precedent in international environmental law, for even today there is considerable question whether customary international law has progressed to the point where transnational water pollution is clearly prohibited.¹⁶⁷ While

166. 1909 Treaty art. IV, second para.

167. See generally the excellent discussions in Bourne, *International Law and Pollution of International Rivers and Lakes*, 21 U. TORONTO L.J. 193 (1971); Jordan, *supra* note 35, at 285-89; Lester, *River Pollution in International Law*, 57 AM. J. INTL. L. 828 (1963); Lester, *Pollution*, in *THE LAW OF INTERNATIONAL DRAINAGE BASINS* 89 (A. Garretson, R. Hayton & C. Olmstead ed. 1967). The authors appear to agree that relevant international law is sparse, general in terms, and often closely related to specific situations and agreements—in the words of one of the authors, "rudimentary" and "embryonic" (Jordan, *supra* at 285).

International agreements that do refer to water pollution problems generally do so in differing terms and with respect to special situations, so no clear rule can be adduced from them other than a very general tendency to condemn pollution, a term which is usually undefined. See Lester, *River Pollution*, *supra* at 841-42. See also Bourne, *supra* at 200; Jordan, *supra* at 287-88; Lester, *Pollution*, *supra* at 102-06. See generally the compilation in *Legal Problems Relating to the Utilization and Uses of International Rivers*, U.N. Doc. A/5409 (1963); 3 M. WHITEMAN, *supra* note 28, at 1043-45. Bourne, *supra* at 200, notes that up to 1965 there were some fifty-two treaties that referred to pollution. Of these, some forty were European and twelve were non-European; and only six dealt exclusively with pollution questions, all of these six being European and all being entered into between 1960 and 1965. The agreements establishing permanent international commissions are, of course, of particular interest. See note 178 *infra*. State practice is similarly sporadic and specialized and does not permit assertion of any clear customary norms. See Lester, *Pollution*, *supra* at 109. Relevant decisions by international tribunals are few in number and largely dicta. Thus, in the Corfu Channel Case (United Kingdom v. Albania), [1949] I.C.J. 3, in dealing with the alleged responsibility of the Albanian government for the mining of an international strait, the Court referred to "[e]very State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States." [1949] I.C.J. 22. In the Lake Lanoux Arbitration (Spain v. France), which involved the right of France to divert and use certain waters of a transnational river system that flowed into Spain when it eventually returned those waters to the system unchanged in quantity or quality, the tribunal, while refusing relief to Spain, commented that its decision might have been otherwise if pollution of the waters had been established. The arbitral decision is reported in 53 AM. J. INTL. L. 156 (1959), and commented on in Laylin & Bianchi, *The Role of Adjudication on International River Disputes: The Lake Lanoux Case*, 53 AM. J. INTL. L. 30 (1959). In the *Trail Smelter* arbitration (see text accompanying notes 91-96 *supra*), the tribunal asserted in very broad language the existence of a principle of international responsibility for transnational air pollution of serious consequence (see text accompanying note 96 *supra*), but since Canada had already assumed responsibility, the tribunal's statement is essentially dictum.

A recent effort to restate the international legal principles relating to international drainage basins is the International Law Association's Committee on the Uses of the Waters of International Rivers HELSINKI RULES, adopted by the International Law Association in 1966. See INTERNATIONAL LAW ASSN., FIFTY-SECOND REPORT—HELSINKI 484-533 (1967); *THE LAW OF INTERNATIONAL DRAINAGE BASINS*, *supra* at 779-830. Article IV of the Rules provides that "[e]ach basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin." Article V provides that "[w]hat is a reasonable and equitable share within the meaning of Article IV is to be determined in the light of all the relevant factors in each particular case." With reference to pollution, the Rules provide as follows:

Article IX

As used in this Chapter, the term "water pollution" refers to any detrimental

provisions in treaties relating to water pollution have become more numerous, they vary widely in content, context, and application.

The 1909 Treaty is silent about specific procedures to be followed in the event that either country claims a violation of Article IV and seeks traditional international legal remedies. However, since Article IX permits either government to refer "any other questions or matters of difference arising between them" to the IJC for examination and an advisory report, each country may, at least in theory, unilaterally compel an advisory opinion on its claim that the other has violated Article IV. Article X goes further by providing procedures under which both governments, by common consent, may submit questions or differences to the Commission for a binding decision. Since the Treaty predates the establishment of either the Permanent Court of International Justice or its successor, the International Court of Justice, there is, of course, no reference in the Treaty to the submission of disputes to those bodies. However, between the years 1946 and 1970 international pollution disputes under the 1909 Treaty would arguably have been within the compulsory jurisdiction of the International Court of Justice under the terms of both the United States and Canadian acceptances of the International Court's

change resulting from human conduct in the natural composition, content, or quality of the waters of an international drainage basin.

Article X

1. Consistent with the principle of equitable utilization of the waters of an international drainage basin, a State

- (a) 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
- (b) 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.

2. The rule stated in paragraph 1 of this Article applies to water pollution originating

- (a) within the territory of the State, or
- (b) outside the territory of the State, if it is caused by the State's conduct.

Article XI

1. In the case of a violation of the rule stated in paragraph 1(a) of Article X of this Chapter, the State responsible shall be required to cease the wrongful conduct and compensate the injured co-basin State for the injury that has been caused to it.

2. In a case falling under the rule stated in paragraph 1(b) of Article X, if a State fails to take reasonable measures, it shall be required promptly to enter into negotiations with the injured State with a view toward reaching a settlement equitable under the circumstances.

See Bourne, *supra* at 195-98 for a recent analysis of the Rules.

On the law of international drainage basins more generally, see, e.g., THE LAW OF INTERNATIONAL DRAINAGE BASINS, *supra*, which contains a number of excellent monographs and reprints; 3 M. WHITEMAN, *supra* note 28, at 872-1075; the HELSINKI RULES, *supra*; Bourne, *The Development of International Water Resources: "The Drainage Basin Approach,"* 47 CAN. B. REV. 62 (1969); Griffin, *The Use of Waters of International Drainage Basins Under Customary International Law*, 53 AM. J. INTL. L. 50 (1959); Shapiro-Libai, *Development of International River Basins: Regulation of Riparian Competition*, 45 IND. L.J. 20 (1969).

jurisdiction through the "optional clause" of the Court's Statute; and either country could have sought to invoke the Court's jurisdiction.¹⁶⁸ While the Connally Amendment¹⁶⁹ might have been invoked by the United States to attempt to defeat the Court's jurisdiction over any such claim brought by Canada or invoked on the basis of reciprocity by Canada with respect to a claim brought by the United States, the propriety of the reservation's use in a case so clearly involving international treaty as well as customary rights would at least have been open to serious question.¹⁷⁰ Thus, while the Treaty's dis-

168. The jurisdiction of the International Court of Justice generally depends upon specific consent of the parties to the dispute, expressed either in a special agreement or in a dispute settlement provision of a more general international agreement. However, under Article 36(2) (the so-called "optional clause" of the Statute of the Court (59 Stat. 1055 (1945), T.S. No. 993)) the state parties to the Statute may at any time declare that they recognize the jurisdiction of the Court in certain broad classes of legal disputes as compulsory without special agreement in relation to any other state accepting the same obligation.

Canada made such a declaration, with certain conditions, with respect to the Permanent Court of International Justice, on September 20, 1929, and this declaration was made applicable to the International Court of Justice, as the Permanent Court's successor, by I.J.C. STAT. art. 36(5). The 1929 Canadian Declaration is reprinted in [1960-61] I.C.J.Y.B. 198; J. CASTEL, *INTERNATIONAL LAW* 844 (1965).

The U.S. made a declaration accepting the compulsory jurisdiction of the International Court under the "optional clause" on Aug. 14, 1946, 61 Stat. 1218 (1947), T.I.A.S. No. 1598, reprinted in [1960-61] I.C.J.Y.B. 217; 15 DEPT. STATE BULL. 452 (1946). The U.S. acceptance, however, includes a "self-judging" reservation added by the much-criticized Connally Amendment. By the terms of that Amendment the U.S. acceptance does not apply to "disputes with regard to matters which are essentially within the domestic jurisdiction of the United States of America as determined by the United States of America" (emphasis added).

On April 7, 1970, the Canadian representative to the United Nations presented to Secretary General U Thant a declaration amending Canada's acceptance of the compulsory jurisdiction of the International Court by adding a reservation that Canada retains jurisdiction over

disputes arising out of or concerning jurisdiction or rights claimed or exercised by Canada in respect of the conservation, management or exploitation of the living resources of the sea, or in respect of the prevention or control of pollution or contamination of the marine environment in marine areas adjacent to the coast of Canada.

See N.Y. Times, April 9, 1970, at 12, col. 1. The full text of the present Canadian declaration is reprinted in 9 INTL. LEGAL MATERIALS 598 (1970). There is some question whether the language "prevention or control of pollution or contamination of the marine environment in marine areas adjacent to the coast of Canada" was intended to cover or could be interpreted to cover pollution control in the Great Lakes. If so, since the U.S. acceptance of the "optional clause" is on terms of reciprocity, the U.S. could presumably now invoke the Canadian reservation as a bar to any attempt by Canada to bring the U.S. before the Court under the "optional clause."

169. See note 168 *supra*.

170. The reciprocal availability of such a self-judging reservation was sustained by the International Court in the Case of Certain Norwegian Loans, [1957] I.C.J. 9. The Department of State was subjected to heavy criticism when it invoked the Connally Reservation in the Interhandel Case, [1959] I.C.J. 6, with respect to the limited issue of its right to sell or otherwise dispose of General Aniline and Film Co. shares after Switzerland had taken that case to the International Court. The case was ultimately disposed of on other grounds. For references to the criticism of the U.S. action in the *Interhandel Case*, and on the Connally Amendment problem gen-

pute-settlement procedures leave something to be desired, traditional international claims procedures for Treaty violation would appear to have been available to the United States and Canada with respect to Great Lakes pollution problems, at least in principle, for over sixty years. Pollution problems between the two countries have been of growing urgency and significance in this period, and Canada has not been remiss in charges that the United States bears major responsibility. Nevertheless, the provisions of Article IV have never been invoked by either government as the basis of a formal specific international claim.

This is not to suggest that Article IV has not had an important influence in the handling of pollution problems. As previously indicated, the Article has traditionally been invoked as an additional jurisdictional basis for pollution references to the IJC under Article IX of the Treaty; typically, the reference directs the Commission to conduct its investigation "with reference to the principles contained in Article IV," and the first question usually asked by the governments in each pollution reference is, in effect, whether the situation in question reveals a general violation of Article IV.¹⁷¹ But, with a few exceptions such as the *Trail Smelter* reference,¹⁷² the terms of such references have been broad rather than specific, with their thrust clearly toward technical assessment and the recommendation of ongoing and future-directed proposals rather than the determination of legal responsibility and specific remedies for past treaty violations.

Various explanations have been suggested for this failure of the United States and Canada to use traditional legal techniques as a method of dealing with boundary waters pollution problems.¹⁷³ First, any specific claim by one government that the other is in violation of Article IV would probably encounter both legal and evidentiary difficulties. The scope of the prohibition is unclear; the terms "pollution" and "injury" are undefined, and their interpretation would raise difficult issues of policy. Evidentiary issues likewise abound. It may be relatively easy for one country to show broadly the existence of specific sources of pollution on the other side of the boundary waters and specific injury from pollution on its side. But to establish

erally, see, e.g., Bilder, *The Office of the Legal Adviser: The State Department Lawyer and Foreign Affairs*, 56 AM. J. INTL. L. 633 n.77 (1962).

171. See, e.g., Question I of the Lower Great Lakes Pollution Reference, indicated in text accompanying note 125 *supra*.

172. See text accompanying notes 91-96 *supra*.

173. See, e.g., Erichsen-Brown, *supra* note 35, at 65-66; Jordan, *supra* note 35, at 292-93; Lester, *River Pollution*, *supra* note 167, at 848.

the necessary causal link between the two will usually be extremely difficult. Absent exceptional situations, such as a massive oil spill or possibly a significant discharge of particularly toxic heavy metals or chemicals, the pollution of a large body of water such as a lake typically occurs through gradual and cumulative processes. Normally, pollution arises from a variety of sources on both sides and the effluents and other inputs into the lake's waters slowly mix under complex hydrological processes. In general, the most that can be said with confidence is that mutual transboundary pollution does occur. Thus, in the IJC's Report on the Lower Great Lakes Pollution Reference, the Commission concluded:

It is difficult to establish positively that the concentration of a particular pollutant on one side of the boundary in the lakes is due to a specific source on the other side. However . . . there is no doubt that contaminants originating in one country do move across the boundary and degrade the quality of the waters in the other country.¹⁷⁴

Second, even if a causal link could be established, obtaining a binding decision with traditional international legal remedies may be difficult, cumbersome, and, in the end, impractical. Article X permits a binding decision only with the consent of both governments. While it has been suggested that the International Court of Justice might arguably have had compulsory jurisdiction over such matters during most of the postwar period, this question is not free from doubt. Even if resort to an international tribunal is possible, the process of adjudication is likely to be expensive and time-consuming. Moreover, in view of the rudimentary state of international pollution law, the outcome will necessarily be uncertain. Finally, the impact of pollution is most typically an accumulation of small and often subtle harms, affecting large numbers of people, and money damages may be hard to calculate and ineffective as a solution. The injunctive powers of international tribunals are limited, and, in any event, injunctions appropriate to the complexities of large scale Great Lakes pollution would be difficult to fashion and administer.

174. IJC LOWER LAKES REPORT, *supra* note 10, at 70. These considerations may also help to explain why there has been no use made of the following provisions of Art. II, first para. of the 1909 Treaty:

[I]t is agreed that any 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

Both the U.S. courts (including state courts) and the Canadian courts are open to foreigners. See generally D. PIPER, *supra* note 10, at 77-78; Scott, *The Canadian-American Boundary Waters Treaty: Why Article II?*, 36 CAN. B. REV. 511 (1958);

Third, each country has been well aware of its own contributions to boundary waters pollution and consequently of its own potential exposure to complaints under Article IV. A resort to formal claims by one country might have invited a retaliatory submission of counterclaims by the other, with considerable risk to both and little possibility of gain to either.

Finally, governments have traditionally been reluctant to entrust their own significant national concerns to the unpredictable and inflexible outcomes of international adjudicative processes and have in general preferred the less risky technique of negotiated settlement of their mutual differences.¹⁷⁵

In view of these considerations, it is not surprising that the two governments have chosen not to adopt liability-based approaches to Great Lakes pollution problems and have tended instead to use the technique of advisory references to the Commission under Article IX of the Treaty. In effect, the Article IX technique offers each country significant advantages at little risk. It permits the two countries to explore the possibilities of useful international cooperation while retaining full control over the most significant decisions and policy. Moreover, it reflects their judgment that the most sensible way of dealing with such technically complex and politically sensitive problems is through flexible and ongoing programs that take account of a multiplicity of factors and are founded on the necessity for compromise and balancing of interests, rather than through legal techniques based on rigid rules and adjudication of past liability.¹⁷⁶

Waite, *International Law Affecting Water Rights in the Western States*, 4 LAND & WATER L. REV. 67, 74-79 (1969). Cf. 3 M. WHITEMAN, *supra* note 28, at 767-68.

175. See, e.g., L. BLOOMFIELD, LAW, POLITICS AND INTERNATIONAL DISPUTES, (Intl. Conciliation Pamphlet No. 516, 1958); Falk, *Realistic Horizons for International Adjudication*, 11 VA. J. INTL. L. 314 (1971).

176. The desirability of handling international pollution problems through cooperative procedures rather than through adjudicative techniques has been stressed by a number of commentators. See, e.g., Jordan, *supra* note 35, at 288-89; Lester, *Pollution*, *supra* note 167, at 109-10. See also Hines, *Nor Any Drop to Drink: Public Regulation of Water Quality, Part II: Interstate Arrangements for Pollution Control*, 52 IOWA L. REV. 432, 434 (1966):

Although it has long been settled that one state may maintain an action against another state to enjoin harmful pollution of shared waters, the states almost never resort to litigation to settle their water quality differences. Instead, where real or potential conflicts appear in the uses to be made of water in a watershed encompassing two or more states, the states involved usually seek to resolve their differences through cooperative arrangements.

While the Supreme Court has adjudicated pollution controversies between one state and another state or citizens of another state (see *New Jersey v. New York City*, 283 U.S. 473 (1931); *New York v. New Jersey*, 256 U.S. 296 (1921); *Georgia v. Tennessee Copper Co.*, 206 U.S. 230 (1907); *Missouri v. Illinois*, 180 U.S. 208 (1901), 200 U.S. 496 (1906)), it has noted the difficulties involved in such adjudications. A recent illustration is *Ohio v. Wyandotte Chem. Corp.*, 401 U.S. 493 (1971), in which the State of Ohio

C. Institutional Structure

International environmental cooperation can be implemented through a variety of formal or informal institutional arrangements.¹⁷⁷ The United States and Canada, of course, have employed principally the technique of the binational commission,¹⁷⁸ thus far with considerable success.

As previously indicated, the IJC is composed of six members, three of whom are nationals of each country selected by their respective governments. The Commissioners need not be technical experts; they have in general tended to be well qualified, though varied in background.¹⁷⁹ During recent years at least, only the chairman of the United States section has received a regular salary; other members for some time received only expenses but are presently being paid when they are actually working on Commission affairs. Up to the present, the Commission's permanent staff has been very small, consisting principally of permanent secretaries for each of the two national sections, who together act as the Commission's administrators.

filed a motion for leave to file a bill of complaint invoking the Court's original jurisdiction against Wyandotte Chemicals Corp. (incorporated in Michigan), Dow Chemical Co. (incorporated in Delaware), and Dow Chemical Company of Canada, Ltd. (incorporated in Ontario). The complaint was directed at an alleged nuisance resulting from the contamination and pollution of Lake Erie by the dumping of mercury into its tributaries. The Court, in an eight-to-one decision with Justice Douglas dissenting, declined to exercise jurisdiction since the issues involved local law that the Ohio courts were competent to consider, several national and international bodies were actively concerned with the pollution problems involved, and the nature of the case required the resolution of complex and novel technical questions that the Court felt did not implicate important problems of federal law, which are the primary responsibility of the Court.

177. See generally LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT, *supra* note 5. See also the various arrangements noted in notes 7 and 156 *supra* and note 178 *infra*.

178. A number of international agreements relating to international rivers or lakes establish international commissions to implement certain of their provisions. For listings of agreements establishing such commissions, see Stein, *The Potential of Regional Organizations in Managing Man's Environment*, in LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT, *supra* note 5, manuscript at 46; Yates, *Unilateral and Multilateral Approaches to Environmental Problems*, 21 U. TORONTO L.J. 182, 187-88 n.27 (1971). See generally Ely & Wolman, *Administration*, in THE LAW OF INTERNATIONAL DRAINAGE BASINS, *supra* note 167, at 126; Kiss & Lambrechts, *La lutte contre la pollution de l'eau en Europe occidentale*, 15 ANNUAIRE FRANCAIS DE DROIT INTL. 718 (1969); Stainov, *Les Aspects Juridique de la Lutte Internationale contre la pollution du Danube*, 72 REVUE GEN. DE DROIT INTL. PUB. 97 (1968).

179. The present membership of the Commission is as follows: U.S. Section—Christain A. Herter, Jr., Chairman, an attorney and presently a high official in the U.S. State Department; Eugene W. Weber, an engineer who was for many years Chief of Civilian Planning with the U.S. Army Corps of Engineers; Charles R. Ross, an attorney and formerly a member of the Federal Power Commission; Canadian Section—Louis J. Robichaud, Chairman, an attorney and former Premier of New Brunswick; A.D. Scott, a Professor of Economics at the University of British Columbia; Bernard Beaupre, an engineer with long experience in the field of water resources.

While the Canadian section has long included an attorney and an engineer on its staff, the American section has not; this situation is in process of being changed by additions of an attorney and an environmental expert to the United States staff. The Commission has typically operated on a limited budget.¹⁸⁰ The recent Joint Communique raises a possibility that the Commission's situation, with respect to both staffing and budget, may improve.

An important characteristic of the IJC has been its tradition of independence and impartiality, a characteristic somewhat akin to an international civil service tradition. The Commission has long prided itself on the fact that, despite its binational structure, it has consistently put aside national loyalties and operated in an essentially apolitical manner. It has seen its task primarily as one of reaching reasoned judgments on the basis of scientific investigation, technological data, and impartial assessment. The strength of this tradition is suggested in a recent article by the two then joint chairmen:

The concept of the treaty negotiators was that solutions to problems in which the two countries had differing—even opposing—interests should be sought, not by the usual bilateral negotiation, but in the joint deliberations of a permanent tribunal composed equally of Canadians and Americans. In other words, the commissioners were to act, not as separate national delegations under instruction from their respective governments, but as a single body seeking common solutions in the joint interest¹⁸¹

The fact that the Commission has divided along national lines or failed to reach agreement in only three of the cases and references it has dealt with is often cited in Commissioners' writings as evidence of the effectiveness of this commitment to impartiality and a search for the common interest.¹⁸²

Another significant characteristic of the Commission has been its use of the technique of appointing special joint technical and advisory boards. As indicated, these are composed of various experts drawn from knowledgeable federal, state, and provincial agencies of the two governments, who serve in an expert rather than representa-

180. For fiscal year 1972, the total budget for the U.S. section of the IJC is approximately \$549,000. Of this amount, \$138,000 is allocated to the Environmental Protection Agency for its work on pollution references, \$221,000 to the Geological Survey for hydrologic data gathering, and the balance of \$190,000 is available for U.S. Section staff and administrative expenses. (Information supplied by IJC, U.S. Section.)

181. Welsh & Heeney, *supra* note 35, at 106.

182. See, e.g., Heeney, *supra* note 35, at 4; Welsh, *Role of the International Joint Commission*, *supra* note 35, at 4. The U.S. Section has identified one of the cases as the Belly-Waterton Rivers Investigation, Doc. No. 57 (1948), a reference in which each Section of the Commission reported separately to its government and no joint report was filed.

tive capacity. A joint board is given the task of carrying out the necessary investigations and making preliminary recommendations on the reference in question, and the Commission in most cases bases its own report largely on that of the board. The governments in their references to the IJC have frequently specifically authorized the use of this technique.¹⁸³ Through the use of such boards, the Commission, while retaining its nominally small staff, has been able to mobilize and deploy a substantial task force of highly trained experts whose collective services might not otherwise be available on a permanent basis. There is apparently an international civil service type of tradition associated with the boards as well as with the Commission itself.

A third important feature of the Commission has been its capacity to respond effectively to the varied tasks the governments have assigned it. Over the years, the Commission has dealt successfully with a remarkable variety of references involving a wide array of problems and disciplines. Its flexibility in dealing with these problems is, of course, in large part a reflection of the breadth of the reference procedures of Article IX itself. But it may also reflect both the adaptability of the joint technical board technique and the Commission's own spirit.

However, while the IJC's performance as an international institution generally merits high marks—and it has achieved considerable respect and credibility—a note of caution may be in order before any generalizations are drawn from this experience. In particular, it may be worth reflecting upon whether the Commission's independence and impartiality are necessarily inherent in its structure, or may instead be related to factors that are coincidental and temporary. It is arguable that the Commission has been left relatively free from political pressures by the two governments principally because until recently they have had only limited interest in its work and have consequently had little reason to exert such pressures. From the perspective of the United States government at least, the Commission has been relatively obscure; its work for the most part has been regarded as of minor political significance. Its functions have been largely limited to scientific and technical investigations, the results of which government officials would presumably not wish to, and probably could not, influence. It has in general had little occasion or tendency to ruffle important feathers. Moreover, the governments have been in a position readily to protect their national interests against adverse Commission action through means other than attempts at direct influence on their national sections. They have consistently retained

183. See note 72 *supra*.

careful control and veto power over the submission and the terms of references and are, in any event, free to reject, or to "accept" and ignore, the Commission's advice.

It is possible that with the growing political importance of the problems with which the IJC deals, with increasing governmental concern over those problems, and with the Commission's growing responsibilities, the two governments may in the future prove less inclined to respect its traditional independence. There may consequently be at least some pressures toward its politicization. The recent appointment of Christian A. Herter, Jr., the Director of the Office of Environmental Affairs and Special Assistant to the Secretary of State, to serve simultaneously as chairman of the United States section could herald such a trend, though that appointment was reportedly based more on budgetary than on policy considerations.

Attempts to bring governmental political influence to bear on the Commission's purely scientific and technical investigations and recommendations would, of course, have a disastrous effect on the Commission's usefulness and credibility. But there are also arguments that limited politicization of the national sections in other respects would be less threatening and might enhance rather than diminish the Commission's usefulness. Thus the governments might be more prepared to give greater regulatory or enforcement powers to a more "political" Commission, in which they could trust their national sections to better reflect and protect their respective interests, than to an "independent" Commission, whose actions they could neither predict nor control. A "political" Commission might also better reflect the real problems and differences between the countries and furnish a continuing forum for negotiation of these differences. Moreover, each national section of a "political" Commission would presumably have more direct access to and influence with the respective national agencies on whose decisions the real solutions of Great Lakes pollution problems must ultimately depend.

D. *Determining Objectives*

A basic issue in any pollution control program is deciding how to define pollution: what types of man-made changes in the environment should be regarded as unacceptable and made the target for corrective action.¹⁸⁴ Clearly, it is neither possible nor desirable to

184. On the special problems of international standard-setting in the area of pollution, see, e.g., *International Environmental Regulation: Means of Achieving Environmental Quality* (prepared by D. Serwer in consultation with O. Schachter), and Contini & Sand, *Methods To Expedite Environmental Protection: International Eco-standards*, in *LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT*, *supra* note 5.

prevent every kind of human impact on the environment. Human activity inevitably produces waste as a by-product, and the capacity of the natural environment to receive, assimilate, and recycle such waste is one of its most significant resource characteristics. As an essentially pejorative term pollution is typically applied not to all waste discharges into the environment but only to those types or levels of wastes whose adverse impact on particular receiving environments suggest a need for social action. Even within this framework scientists, engineers, economists, social planners, and politicians might each define pollution differently. Pollution control thus involves determining the kinds and levels of wastes that merit attention, assessing the costs and benefits of alternative ways of dealing with particular wastes, deciding on priorities, planning balanced programs, deploying and implementing effective measures of control, and monitoring progress made with a view to possible readjustment of programs.

There is increasing recognition that many of these tasks involve essentially policy or value judgments rather than purely scientific or technical assessment.¹⁸⁵ The role of science in this process is, of course, vital. Scientists alone can alert societies to the existence of environmental threats and provide data relevant for rational decisions—in particular, the sources, amounts, and pathways of various pollutants and the potential consequences in terms of the specific degrees of risk that may result from exposure to particular types and levels of pollutants under varying circumstances. Similarly, engineers perform an essential role in defining technological possibilities and options for control. But questions about the goals, priorities, and weights a society should properly give to the costs, risks, and benefits of alternative courses of action in differing circumstances—the basic choices about what we really want and what we are willing to pay to get it—are questions that science and technology can rarely answer, although we could, if we desired, let scientists or engineers make the necessary policy decisions for us.

The 1909 Treaty does not define pollution,¹⁸⁶ and the difficulties

185. See, e.g., J. DAVIES, *THE POLITICS OF POLLUTION* 17-21 (1970).

186. See 1909 Treaty art. IV. In practice, however, the Commission has frequently been prepared in its reports on various references to conclude that transboundary pollution was occurring to the detriment of both countries. Note also the following statement by the Commission:

The Commission regards the word "injury" when used in the reference or treaty as having a special significance—one somewhat akin to the term "injuria" in jurisprudence. It does not mean harm or damage but harm or damage which is in excess of the amount of harm or damage which the sufferer, in view of all the circumstances of the case, and of all the co-existence rights . . . and of the para-

of formulating a simple, sufficiently broad, generally applicable, and operationally useful definition are apparent.¹⁸⁷ The Commission, however, has in effect provided a way of defining pollution, applicable to varying circumstances, through its technique of recommending common water quality objectives.¹⁸⁸ Since the water quality objectives recommended in the IJC Lower Lakes Report¹⁸⁹ will reportedly be incorporated in substance in the proposed Agreement, the Commission's approach should be briefly described.

The Lower Lakes Report defines common water quality objectives as desirable levels of quality to be attained in the receiving waters, taking into account the scientific requirements or criteria for a broad spectrum of water uses: "supplies for municipal, industrial and agricultural purposes, recreation, aesthetic enjoyment and the propagation of aquatic life and wild life."¹⁹⁰ The Report recommends both "General Objectives" and "Specific Objectives." The General Objectives are the goals of an effective pollution control program stated in very broad terms.¹⁹¹ The Specific Objectives are

mount importance of human health and life, should reasonably be called upon to bear.

IJC, REPORT ON POLLUTION OF BOUNDARY WATERS (1918), *quoted in* Erichsen-Brown, *supra* note 35, at 68.

187. For an example of such a definition, see Article IX of the HELSINKI RULES, *supra* note 167, at 494:

As used in this Chapter, the term "water pollution" refers to any detrimental change resulting from human conduct in the natural composition, content, or quality of the waters of an international drainage basin.

Compare § 2(1)(k) of the Canada Water Act, STAT. CAN. c. 52 (1969-1970), which defines "waste" as

any substance that, if added to any waters, would degrade or alter or form part of a process of degradation or alteration of the quality of those waters to an extent that is detrimental to their use by man or by any animal, fish or plant that is useful to man, and includes any water that contains a substance in such a quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any waters, degrade or alter or form part of a process of degradation or alteration of the quality of those waters to an extent that is detrimental to their use by man or by any animal, fish or plant that is useful to man.

The definition of "waste" is similar in the Canadian Arctic Waters Pollution Prevention Act, STAT. CAN. c. 47, § 2(h) (1969-1970).

188. As indicated in text accompanying notes 99-100 *supra*, this technique was first used in the Commission's 1950 Report in the *Connecting Channels Reference*.

189. IJC LOWER LAKES REPORT, *supra* note 10, at 112-29, 144-48.

190. IJC LOWER LAKES REPORT, *supra* note 10, at 113.

191. The proposed General Objectives, which are described as the "five freedoms" of a pollution control program, are

The receiving waters of Lake Erie, Lake Ontario, the International Section of the St. Lawrence River and the Connecting Channels of the Great Lakes at all places and at all times should be:

- (a) free from substances attributable to municipal, industrial or other discharges that will settle to form putrescent or otherwise objectionable sludge deposits, or that will adversely affect aquatic life or waterfowl.
- (b) free from floating debris, oil, scum and other floating materials attributable

the desirable levels of water quality, stated for the most part in terms of specific scientific indices. These indices set forth the maximum permissible levels and concentrations of the pollutants in the waters considered necessary to achieve the General Objectives. These objectives are to apply to all jurisdictions sharing the waters of the Lower Great Lakes at all times and places; they apply in particular to in-shore waters. Specific Objectives are recommended for microbiology (coliform group), dissolved oxygen, total dissolved solids, temperature, taste and odor, pH, iron, phosphorus, and radioactivity; when required, appropriate specific standards will be established for water quality including, but not restricted to, toxic wastes, oils, and heavy metals.¹⁹²

The Report contemplates that these objectives will be implemented by each government through appropriate national, state, or provincial action. Thus, the Specific Objectives are intended both as the minimum basis for formulating provincial and state water quality standards and as parameters against which the effectiveness of such programs can be measured.¹⁹³ Presumably governmental authorities will establish compatible ambient water quality standards for the Lakes with at least as stringent maximum permissible levels for each relevant pollutant; will establish, as needed, effluent, discharge, or emission standards setting the maximum acceptable release of a particular pollutant from a given source to the water under specified circumstances; and will take other action to ensure that the

to municipal, industrial or other discharges in amounts sufficient to be unsightly or deleterious.

- (c) free from materials attributable to municipal, industrial or other discharges producing colour, odour or other conditions in such a degree as to create a nuisance.
- (d) free from substances attributable to municipal, industrial or other discharges in concentrations that are toxic or harmful to human, animal or aquatic life.
- (e) free from nutrients derived from municipal, industrial and agricultural sources in concentrations that create nuisance growths of aquatic weeds and algae.

Id. at 144-45.

192. *Id.* at 145-48. Examples of the Specific Objectives are

- (a) *Microbiology (Coliform Group)*—The geometric mean of not less than five samples taken over not more than a 30-day period shall not exceed 1,000/100 ml total coliforms, nor 200/100 ml fecal coliforms in local waters. Waters used for body contact recreation activities should be free from bacteria, fungi, or viruses that may produce enteric disorders, or eye, ear, nose, throat and skin infections.
- (b) *Dissolved Oxygen*—In the Connecting Channels and in the upper waters of the Lakes not less than 6.0 mg/l at any time; in the hypolimnetic waters not less than the concentrations necessary for the support of fishlife, particularly cold water species.

Id. at 145-46. Contrast the objective for: "(d) *Temperature*—No change which would adversely affect any local or general use of these waters." *Id.* at 146.

193. *Id.* at 114-15.

objectives are achieved. The Commission stresses that the important criterion of compliance is not the degree of treatment of wastes but the amount of wastes left in the effluent and, from the standpoint of a broad pollution control program, the total amount of contaminants discharged by all sources within the jurisdiction.¹⁹⁴

The Lower Lakes Report gives special emphasis to the problems of phosphorus wastes as a critical factor in Lower Lakes pollution. It points out that of the nutrients involved in eutrophication of Lake Erie and Lake Ontario, "phosphorus is the only one that is both growth-limiting in the lakes and controllable effectively by man with present technology."¹⁹⁵ The Commission takes the position that the reduction of phosphorus input into the waters will significantly delay further eutrophication and will permit the recovery of the Lakes to begin through natural processes.¹⁹⁶ It indicates that the recommended Specific Objective for phosphorus¹⁹⁷ can be achieved if all phosphorus is eliminated from detergents, and if ninety-five per cent of the predicted 1986 load of phosphorus is removed at municipal and industrial waste plants.¹⁹⁸ The Commission gives the following reasons for emphasizing a reduction in phosphorus in detergents: (1) if a replacement for detergent phosphorus can be developed rapidly, a significant reduction of phosphorus input can be achieved before completion of phosphorus removal facilities at sewage treatment plants; (2) the effect would be to reduce phosphorus input from small communities, cottages, and individual homes, in which it would be very costly to install phosphorus removal facilities; and (3) treatment costs for phosphorus removal at sewage treatment plants would be reduced substantially by removing phosphorus from detergents.¹⁹⁹

194. *Id.* at 115-16.

195. *Id.* at 141.

196. *Id.* at 123.

197. *Phosphorus*—Concentrations limited to the extent necessary to prevent nuisance growths of algae, weeds and slimes which are or may become injurious to any beneficial water use. (Meeting this objective will require that the phosphorus loading to Lake Erie be limited to 0.39 g/m²/yr and the phosphorus loading to Lake Ontario be limited to 17 g/m²/yr.)

Id. at 147.

198. *Id.* at 125. "The major source of phosphorus is municipal sewage. In the U.S. 70% of the phosphorus in sewage originates from detergents, and most of the remainder from human excreta. In Canada, approximately 50% originates from each sewage source. Apart from municipal sewage the other significant sources of phosphorus are agricultural run-off and some industrial wastes." *Id.* at 141. The research results of "Project Hypo," a joint U.S.-Canadian project carried on in Lake Erie in the summer of 1970 to obtain more precise data on Lake nutrients, suggest that the 95% removal goal may have to be attained by 1975 rather than 1986 if eutrophication of the Lake is to be effectively reversed. (Information based on interviews with U.S. government officials.)

199. *Id.* at 125.

Canada has already taken steps to limit the phosphorus content of detergents, expressed as phosphorus pentoxide, to twenty per cent by weight, effective August 1, 1970, and has announced a further reduction to five per cent by December 31, 1972. Some of the Lake states and local authorities have adopted or introduced legislation to limit the phosphorus content of detergents.²⁰⁰

The Commission's concept of establishing specific water quality objectives is a significant contribution to pollution control techniques and is being widely copied.²⁰¹ It focuses on a matter of principal international concern—the quality of the receiving waters—while leaving to each jurisdiction wide flexibility regarding the choice of the means that, in terms of local circumstances and conditions, are best suited to achieving those objectives. It embodies an approach to problems of international pollution that is based on continuing regulation and control to attain goals, rather than on rights, duties, and legal liability for past actions. It provides concrete scientific standards against which performance and compliance can be measured. Finally, it permits ready revision and adjustment of objectives in the light of new information or other current considerations.

The process by which the Commission arrives at its recommendations of Specific Objectives is not entirely clear. Presumably, the Commission will as a rule accept the Specific Objectives suggested by its technical boards. Since the boards include members from the principal federal, state, and provincial standard-setting and implementing agencies, it is not surprising that the recommended international objectives in general tend to be compatible with and do not exceed already established state and provincial standards. In some cases, however, the recommended international objectives will require a tightening of particular state or provincial standards. Despite the policy component in all such decisions, the process of establishing

200. See Joint Communiqué, *supra* note 1, ¶ 6; note 245 *infra*. Compare the European Agreement on the Restriction of the Use of Certain Detergents in Washing and Cleaning Products, adopted by the Council of Europe on Sept. 16, 1968, 16 EUROPEAN Y.B. 335 (1968), and already implemented by several member states, establishing an 80% biodegradability level.

201. See text accompanying notes 99-100 *supra*. See also, e.g., the 1971 Draft European Convention on the Protection of Freshwater Against Pollution, prepared by the Council of Europe, which now envisages the establishment of "minimum water quality standards," Report of the First Meeting (Feb. 1971) of the Expert Commission on a Draft European Convention on the Protection of Freshwater Against Pollution; and the 1971 Draft Agreement on Water Conservation and Utilization in the Lake Chad Basin, prepared by FAO and the Lake Chad Basin Commission, which provides standards for water abstraction and pollution control. FAO Doc. AGL:SF/REG/79 (1971). See Contini & Sand, *Methods To Expedite Environmental Protection: International Ecostandards*, in LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT, *supra* note 5, manuscript at 12.

objectives has apparently been treated as a matter of purely scientific and technical judgment, though some internal negotiation may occur. If the Commission were ever to consider recommending Specific Objectives considerably more stringent than those then applicable in the various states and provinces, it is conceivable that substantial policy issues might emerge. This situation would, of course, cast the Commission in a new and more difficult role.

A final issue is posed by the September 15, 1971, announcement of the United States Surgeon General, Jesse L. Steinfeld, advising housewives to continue using phosphate detergents.²⁰² The basis for the Government's shift of policy is its judgment that some phosphate substitutes are highly caustic and may constitute a health hazard. Environmental Protection Agency Administrator William A. Ruckelshaus stated, in connection with the Surgeon General's announcement, that the Government would increase its financial assistance for the removal of phosphates at sewage treatment plants as an alternative to the banning of phosphate detergents.²⁰³ The new United States position could raise doubts about its ability to achieve the Commission's recommended phosphorus objectives by the proposed Agreement's 1975 target date. First, it is questionable whether, if the use of phosphate-based detergents is permitted to continue, it will be technically possible through more intensive sewage treatment techniques alone to reduce phosphate loadings into the Lakes to the extent recommended by the Commission. Second, the additional techniques proposed will presumably involve substantial additional costs, making the programs more politically vulnerable. In view of the pivotal role of phosphorus in the solution of Great Lakes pollution problems and of Canada's particular concern over high United States phosphorus loadings²⁰⁴ and its present commitment to the

202. See N.Y. Times, Sept. 16, 1971, at 1, col. 2 (joint announcement with William D. Ruckelshaus, EPA Administrator, Russell E. Train, and Dr. Charles C. Edwards, FDA Chairman). For further comments and developments following the announcement, see *id.*, Sept. 16, 1971, at 37, col. 2; *id.*, Sept. 17, 1971, at 1, col. 4, and at 20, col. 1; *id.*, Sept. 18, 1971, at 58, col. 1; *id.*, Sept. 19, 1971, at 52, col. 3; *id.*, Sept. 22, 1971, at 46, col. 1 (editorial); *id.*, Sept. 24, 1971, at 40, col. 3 (letter to editor).

203. N.Y. Times, Sept. 16, 1971, at 1, col. 2. See also the October 27, 1971, statement by CEQ Chairman Russell E. Train before the House Government Operations Subcommittee on Conservation and Natural Resources that the elimination of phosphates would not eliminate eutrophication, that the principal strategy in controlling eutrophication will be provision of adequate waste treatment, and that, given the present state of knowledge, there is no one answer as to which discharges of phosphorus should be controlled to limit accelerated eutrophication and the possible problems with currently available substitutes for phosphates. See BNA ENVIRONMENT REP., CURRENT DEVELOPMENTS 763 (1971).

204. See, e.g., the comment by J.J. Greene, the Canadian Minister of Energy, Mines and Resources, *Policy on the Environment*, 21 U. TORONTO L.J. 241, 246 (1971):

Even between nations that do not have disparate levels of economic development,

banning of phosphate detergents,²⁰⁵ the recent United States action could raise new difficulties for the negotiators of the proposed Agreement.

E. *Apportioning Burdens*

Another major issue of international environmental cooperation is how the burden of international pollution control is to be shared or apportioned among the various governments contributing to a particular pollution problem. This question arises most clearly in situations involving pollution by several riparian states of a confined and complex mixing environment, such as the Great Lakes and enclosed or semi-enclosed seas such as the Baltic, Mediterranean, Black, Caribbean, and North Seas.

A first step in any process of apportionment is agreement on broad water quality objectives, from which can be derived at least a broad estimate of the maximum total amount of each pollutant that can be permitted to be discharged into the total basin environment. Once this total basin-wide maximum for permissible waste discharges is determined, the job of complying with the standard might then be divided or apportioned among the contributing states according to various bases or formulas.²⁰⁶ The possible apportionment formulas might include division in equal shares; in proportion to relative total populations; in proportion to relative total gross national products; in proportion to relative basin populations; in proportion to relative basin GNPs; in proportion to the ratio of basin to total populations; in proportion to the ratio of basin to total GNPs; in direct proportion to relative past waste discharges or contribution to total existing pollution; in inverse proportion to relative past waste discharges or contribution to total existing pollution; and so forth. Alternatively, a total basin-wide quota of the necessary or desired amounts of

agreement is difficult to achieve. The record of co-operation between Canada and its closest friend and neighbour, the USA, is anything but bright, notwithstanding the excellent investigatory work of the International Joint Commission. It is now clearly established on the basis of independent expert evidence that the Great Lakes water system will not be cleaned up until the USA takes the tough decision to ban phosphates from detergents. This it seems reluctant to do. I feel that the only way to achieve real progress in the cleaning of our international boundary waters would be to equip the IJC with the authority to enforce its ruling with regard to pollution of international boundary waters.

205. See Joint Communiqué, *supra* note 1, ¶ 6; note 245 *infra*.

206. See, e.g., the interesting paper by A. Sparring, Pollution Control as a Problem of International Politics: Models for a Baltic Convention, prepared for the 21st Pugwash Conference on Science and World Affairs, "Problems of World Security, Environment, and Development," Sinaia, Romania, Aug. 26-31, 1971, on file with the *Michigan Law Review*.

reductions in waste discharges could be determined, and this system of necessary cutbacks could then be apportioned on one or another of the above bases. Finally, the burden of pollution control could be indirectly apportioned through the establishment of uniform specific quality, discharge, or technological standards. Obviously, uniform rules will affect various states differently.

In the context of Great Lakes pollution, the issue of burden sharing might have been posed in considerable complexity. For example, while the United States has both greater total and Great Lakes basin population and GNP than Canada and in general contributes more wastes to the Lakes than Canada, the Canadian Great Lakes population and GNP are of considerably greater relative importance to that country than the same factors are to the United States. On the other hand, about two thirds of the Great Lakes water area is in the United States and only one third in Canada. In practice, however, the differences between the two countries have been primarily shaped less by abstract theories of apportionment than by differing interpretations of the express provisions of the 1909 Treaty.

The Canadian position is reportedly based primarily on Article VIII of the Treaty, which, *inter alia*, provides: "The . . . Parties shall have, each on its own side of the boundary, equal and similar rights in the use of the waters hereinbefore defined as boundary waters." Apparently, the Canadian view is that "use of the waters" in this provision includes their use as a receiver of wastes and that Canada is consequently entitled to an equal right to, or a share in, the use of the Lake's capacity to assimilate polluted effluents.²⁰⁷ Since the United States has already discharged wastes into its waters in amounts far in excess of the wastes that Canada has discharged into its waters, Canada argues that it is in principle entitled to continue discharging wastes into its waters until these discharges reach the level of United States discharges into United States waters. Put otherwise, if the IJC standards are to be met and Great Lakes pollution prevented, the United States must restrict its discharges to a level not to exceed fifty per cent of the total loading the Lakes can receive without exceeding the IJC's water quality objectives. Carried to the extreme, this position would place virtually the entire burden of the reduction of waste discharges and of effective Great Lakes pollution control on the United States. In practice, however, Canada apparently does recognize

207. The discussion of these differing interpretations of the Treaty by the two governments is based on interviews with government officials. The author cannot, of course, speak for either government or reflect more than his own understanding of the issues involved.

some obligation to reduce its discharges in order to help prevent pollution.

The United States reportedly rejects the Canadian position and takes the view that the broad prohibition on pollution in Article IV of the Treaty is controlling.²⁰⁸ It argues that use of the Great Lakes water as a receptor for waste effluents is not one of the uses protected by Article VIII; that Article VIII is by its terms concerned only with establishing rules and principles for the specific purpose of governing the Commission in passing upon applications for the use or obstruction or diversion of the waters;²⁰⁹ and that the "equal and similar rights" language relied upon by the Canadians consequently has no relevance to broader questions of pollution. In the American view the relevant Treaty provision is the provision in Article IV that "[i]t is further agreed that the waters herein defined as 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." Under this provision, neither country has a right to pollute the boundary waters and consequently there is no question about the division of any such right to pollute. Instead, the two countries have equal obligations to take measures to limit and control harmful discharges that the Commission has indicated emanate from both of their territories even if these in fact come principally from the United States shore. The important consideration is not how much waste each country has in the past contributed to the Lakes but the fact that the Lakes, for whatever reason, are *now* in a condition of threatened danger. Faced with such a situation each nation has, under Article IV, an equal obligation to act to correct it.

Neither country appears to have carried its position to the logical extremes the above arguments suggest, and the differences have in effect largely been bypassed and accommodated in the relevant ar-

208. *Id.*

209. Article VIII provides in relevant part:

This International Joint Commission shall have jurisdiction over and shall pass upon all cases involving the use or obstruction or diversion of the waters with respect to which under Articles III and IV of this Treaty the approval of this Commission is required, and in passing upon such cases the Commission shall be governed by the following rules or principles which are adopted by the High Contracting Parties for this purpose:

The High Contracting Parties shall have, each on its own side of the boundary, equal and similar rights in the use of the waters hereinbefore defined as boundary waters.

.....
The requirement for an equal division may in the discretion of the Commission be suspended in cases of temporary diversions along boundary waters at points where such equal division can not be made advantageously on account of local conditions, and where such diversion does not diminish elsewhere the amount available for use on the other side.

.....

rangements. In practice, Ontario has imposed strict water quality and discharge standards and other pollution controls and the United States is apparently willing to concede that control of the situation on its shore will require substantially greater expenditures—perhaps as much as six times greater—than those Canada must assume. Moreover, it would seem that the IJC's recommended Specific Objectives, if incorporated in the proposed Agreement, will as a practical matter impose a substantially heavier burden on the United States than on Canada. Since the objectives apply uniformly to inshore waters and since the United States in general contributes more waste to the Lakes, it will presumably have to take more stringent measures of control than Canada in order to maintain the same inshore water quality. The proposed Agreement may thus in effect settle this issue. However, neither government has formally abandoned its position. This is made clear by the fact that, in the Joint Communique announcing the proposed Agreement the Ministers were careful to note: "In designing the agreement, it was accepted that programs and other measures established to meet urgent problems would in no way affect the rights of each country in the use of its Great Lakes Waters."²¹⁰ The question of apportionment remains one that could on occasion reappear and in principle prove very troublesome.

F. Coordination

One of the more complex and confusing aspects of Great Lakes pollution problems is the diversity of jurisdictions and the multiplicity of official and unofficial agencies and institutions that are involved in these problems. A brief survey may indicate the dimensions of the difficulty.²¹¹

Eleven separate major governmental jurisdictions border on the Great Lakes. These are the United States and Canada (in their national governmental capacity), eight states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin), and the Province of Ontario.²¹² Each of these jurisdictions has its own laws, agencies, policies, programs, and enforcement techniques concerned with or bearing upon Great Lakes pollution problems. In addition, several hundred municipalities and local communities, each with its own ordinances and practices, border both sides of the Lakes.

210. Joint Communique, *supra* note 1, ¶ 17.

211. See generally GREAT LAKES INSTITUTIONS, *supra* note 10.

212. While the Province of Quebec is not a Great Lakes riparian, it was represented in the Ministerial Conference's Joint Working Group and may be represented on a Great Lakes Pollution Advisory Board.

Making sense of the complex governmental situation respecting Great Lakes pollution problems in any one of these jurisdictions can be difficult; when they are considered together, the problem is immense.

In the United States there are at least nine federal agencies that are heavily involved in problems of Great Lakes pollution. These include the Departments of State,²¹³ Agriculture,²¹⁴ Interior,²¹⁵ Commerce,²¹⁶ Defense,²¹⁷ Transportation,²¹⁸ and Health, Education, and Welfare,²¹⁹ the Council on Environmental Quality;²²⁰ and the Environmental Protection Agency.²²¹ Other agencies such as the Department of Housing and Urban Development, the Atomic Energy Commission, Federal Power Commission, National Council on Marine Resources and Engineering Development, National Science Foundation, and the Water Resources Council also have strong interests in this area.²²²

213. Principally, the Bureau of European Affairs, which has responsibility for relations with Canada.

214. Principally, the Soil Conservation Service, Forest Service, Agricultural Research Service, and Economic Research Service.

215. Principally, the Bureau of Commercial Fisheries, Bureau of Outdoor Recreation, Bureau of Sport Fisheries and Wildlife, U.S. Geological Survey, and National Park Service.

216. Principally, the National Oceanic and Atmospheric Administration (NOAA), Economic Development Administration, and Maritime Administration. The NOAA, established in 1970, consolidates the major federal oceanic and atmospheric research and monitoring programs. Both the Weather Bureau and the Coast and Geodetic Survey now operate within the NOAA.

217. Principally, the Army Corps of Engineers, Dept. of Navy (which is concerned with ship pollution control), and Office of Naval Research.

218. Principally, the U.S. Coast Guard (which is concerned with ship sanitation and oil spills), and the St. Lawrence Seaway Development Corporation.

219. Principally, the Public Health Service.

220. The Council on Environmental Quality (CEQ) was established January 1, 1970, by the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-47 (1970). The Act charges the Council with assisting the President in preparing an annual environmental quality report and making recommendations to him on national policies for improving environmental quality; empowers the Council to analyze conditions and trends in the quality of the environment and to conduct investigations relating to the environment; and gives the council responsibility for appraising the effect of federal programs and activities in environmental quality. *See* 43 U.S.C. § 4344 (1970).

221. The Environmental Protection Agency (EPA), officially established on December 2, 1970, consolidated into one agency the major federal programs dealing with air and water pollution, solid waste disposal, pesticides regulation, and environmental radiation. Presidential Documents: Reorganization Plan No. 3 of 1970, 35 Fed. Reg. 15623 (1970). Its offices specifically concerned with Great Lakes pollution are the Office of Waters Programs under the Assistant Administrator for Media Programs, and the Assistant Administrator for Research and Monitoring. The Great Lakes is a primary responsibility of the EPA's Region V regional office.

222. *See* GREAT LAKES INSTITUTIONS, *supra* note 10, at 22-24. On March 25, 1971, President Nixon sent to Congress legislation to create a Department of Natural Resources, which would include, *inter alia*, an Administrator for Water Resources. S. 1431, 92d Cong., 1st Sess. (1971); H.R. 6959, 92d Cong., 1st Sess. (1971). *See* CEQ 1971 REPORT, *supra* note 7, at 6-7.

All national agencies with an active interest in the Lakes are members of the Federal Inter-Agency Committee on Great Lakes Research. A considerable number of congressional committees are also concerned with various aspects of Great Lakes pollution and may on occasion seek to exercise competing jurisdiction over relevant legislation.²²³ In addition, each of the states bordering the Great Lakes has at least one, and frequently several, agencies concerned with Great Lakes pollution problems.²²⁴

Two federal-state commissions and one interstate commission have a major involvement in Great Lakes problems. The Great Lakes Basin Commission, established under the authority of the Water Resources Planning Act of 1965,²²⁵ is composed of representatives of the eight Great Lakes states, a number of concerned federal agencies, and the Great Lakes (Compact) Commission. Operating with extensive federal financial assistance, this important Commission has responsibility for improved comprehensive planning of the water and related resources in the United States portion of the Great Lakes and is designed to be the effective coordinating agent for all federal, state, and local agencies and nongovernmental entities with planning responsibilities in these fields.²²⁶ The Upper Great Lakes Regional Commission, created by the Secretary of Commerce under the Public Works and Economic Development Act of 1965,²²⁷ is composed of a federal member appointed by the President and members from the states of Michigan, Minnesota, and Wisconsin. It has the task of identifying economic problems and potentials of the Upper Lakes and recommending public investment to stimulate the lagging economy of the region. The performance of these responsibilities neces-

223. The Senate and House Committees on Public Works have been particularly concerned with water pollution problems. The Senate and House have recently passed joint resolutions to create a Joint Committee on the Environment. S.J. Res. 17, 92d Cong., 1st Sess. (1971); H.R.J. Res. 3, 92d Cong., 1st Sess. (1971). The Congress has also recently reorganized and expanded existing committees to give more explicit attention to environmental problems. See CEQ 1971 REPORT, *supra* note 7, at 8. See generally J. DAVIES, *supra* note 185, at 65-70.

224. See GREAT LAKES INSTITUTIONS, *supra* note 10, at 26-38 for a list of agencies as of June 1969. Some reorganization and consolidation of state agencies has occurred in the past several years. For more recent developments, see the BNA ENVIRONMENT REPORTER, a weekly report on national and state legislative and other developments in the environmental field, including water quality.

225. 42 U.S.C. §§ 1962-62d-3 (1970).

226. See generally GREAT LAKES INSTITUTIONS, *supra* note 10, at 24-25; GREAT LAKES BASIN COMMN., CHALLENGES FOR THE FUTURE, AN INTERIM REPORT ON THE GREAT LAKES BASIN FRAMEWORK STUDY (1971); Great Lakes Basin Commission, What It Is—What It Does (Commission pamphlet). The Basin Commission also issues a monthly newsletter, the Communicator. Its headquarters are located at Ann Arbor, Michigan.

227. 42 U.S.C. §§ 3121-3226 (1970). See 42 U.S.C. § 3182 (1970).

sarily involves the Regional Commission in consideration of Upper Lakes pollution problems.²²⁸ The Great Lakes Commission was established by the Great Lakes Basin Compact, an interstate agreement among the eight Great Lakes states, and was approved by Congress in 1968,²²⁹ which designated it as a joint state instrumentality on Great Lakes water resources development, programs, and problems.²³⁰ It serves as a clearing house for information, a council for joint consideration of common and regional Great Lakes problems, and an instrument for coordinating state views, plans, recommendations, programs, and policies.²³¹

228. *E.g.*, GREAT LAKES INSTITUTIONS, *supra* note 10, at 25.

229. Act of July 24, 1968, Pub. L. No. 90-419, 82 Stat. 414 (containing text of Compact). U.S. CONST. art. 1, § 10 requires congressional consent to such compacts.

230. The Compact was formed in 1955 through ratification by five of the eight riparian states; Ohio, Pennsylvania, and New York ratified subsequently. The text of the Compact, with notes on its legislative history, is also reprinted in H.R. Doc. No. 319, 90th Cong., 2d Sess. 177-83 (1968) (Documents on the Use and Control of the Waters of Interstate and International Streams).

It is interesting to note that Article II(B) of the Compact provides: "The Province of Ontario and the Province of Quebec, or either of them, may become states party to this compact by taking such action as their laws and the laws of the Government of Canada may prescribe for adherence thereto." 82 Stat. 414. In addition, Article VI provides that the Commission shall have power to:

J. With respect to the water resources of the Basin or any portion thereof, recommend agreements between the governments of the United States and Canada.

K. Recommend mutual arrangements expressed by concurrent or reciprocal legislation on the part of Congress and the Parliament of Canada including but not limited to such agreements and mutual arrangements as are provided for by Article XIII of the . . . [1909 Treaty].

M. At the request of the United States, or in the event that a Province shall be a party state, at the request of the Government of Canada, assist in the negotiation and formulation of any treaty or other mutual arrangement or agreement between the United States and Canada with reference to Basin or any portion thereof.

82 Stat. 417-18.

The State Department objected to these provisions when the Compact was presented to Congress for its approval on the grounds, *inter alia*, that Provincial participation and the other above-cited provisions would involve the Commission in the field of international relations. *See* D. PIPER, *supra* note 10, at 80. Section 2 of the Act of July 24, 1968, consequently limited congressional consent by providing that the consent granted does not extend to the above sections; Section 3 provided that nothing contained in the Act shall be "construed to establish an international agency or to limit or affect in any way the exercise of the treaty-making power or any other power or right of the United States." 82 Stat. 419.

231. *See, e.g.*, GREAT LAKES INSTITUTIONS, *supra* note 10, at 25. Under Art. VII(B) of the Compact, the states agree to consider the recommendations of the Great Lakes Commission with respect to "[m]easures for combating pollution," 82 Stat. 418.

The Great Lakes Commission is financed entirely by state funds. It has its headquarters at Ann Arbor, Michigan.

On interstate compacts generally, see 3 R. CLARK, *supra* note 23, at 332-48; W. BARTON, INTERSTATE COMPACTS IN THE POLITICAL PROCESS (1967); F. ZIMMERMANN & M. WENDELL, THE LAW AND USE OF INTERSTATE COMPACTS (1961).

In Canada the recently created Department of the Environment now exercises principal responsibility for Great Lakes pollution problems.²³² Other Canadian federal agencies with concerns in this area are the Departments of External Affairs; Energy, Mines and Resources; National Health and Welfare; Public Works; and Transport.²³³ Additional research responsibilities are carried out by the Canada Centre for Inland Waters, the Fisheries Research Board of Canada, and the Great Lakes Working Group of the Canadian Committee on Oceanography.²³⁴ In the Province of Ontario, the Ontario Water Resources Commission has primary responsibility for Great Lakes pollution problems; the Department of Lands and Forests and the Hydro-Electric Power Commission of Ontario are also heavily involved.²³⁵

Several United States-Canadian institutions other than the International Joint Commission are actively engaged in cooperation on Great Lakes problems. The Great Lakes Fishery Commission is a formal intergovernmental organization established by the Great Lakes Fisheries Convention of 1955;²³⁶ it is primarily a research organization but has also administered an extensive program of sea lamprey control.²³⁷ The Great Lakes Study Group is an informal international organization including representatives of Canadian and United States agencies and institutions engaged in research and investigation related to the development and utilization of Great Lakes resources and is intended to facilitate the exchange of information and provide informal coordination, including the sponsorship of a data repository. Other international cooperative institutions include

232. The Department of the Environment was established in 1971, incorporating as components the former Department of Fisheries and Forestry; essentially all of the Water Sector of the Department of Energy, Mines and Resources, including the Inland Waters Branch, the Marine Sciences Branch, the Policy and Planning Branch, and the Canada Centre for Inland Waters; the Canadian Meteorological Service; the Canadian Wildlife Service; and those units of the Department of National Health and Welfare concerned with public health engineering and air pollution. The Department will have primary responsibility for support of the IJC. Government Reorganization C-207 (1971). *See, e.g.*, Great Lakes Basin Commn. Communicator, Feb. 1971.

233. *See* GREAT LAKES INSTITUTIONS, *supra* note 10, at 8-10.

234. *Id.* at 7-8.

235. *Id.* at 10-11.

236. Convention with Canada on Great Lakes Fisheries, Sept. 10, 1954, [1955] 6 U.S.T. 2836, T.I.A.S. No. 3326, 238 U.N.T.S. 97 (effective Oct. 11, 1955), *as amended* April 5, 1966, and May 19, 1967, [1967] 18 U.S.T. 1402, T.I.A.S. No. 6297. *See also* Great Lakes Fisheries Act of 1956, 16 U.S.C. §§ 931-39c (1970).

237. *See* GREAT LAKES INSTITUTIONS, *supra* note 10, at 4-5. The sea lamprey is a species of eel native to the Atlantic Ocean that entered the Great Lakes system through the opening of the Welland Canal; it has multiplied in the absence of its natural biological controls and has preyed upon and wreaked havoc among certain Great Lakes fish species.

the St. Lawrence Seaway Commission, the International Association for Great Lakes Research, the Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data, and the International Field Year for the Lakes. A number of private scientific, professional, research, and industry associations, as well as universities and colleges in all of the Great Lakes states and Ontario, are also active with respect to Great Lakes problems.²³⁸

With so many jurisdictions concerned with controlling Great Lakes pollution and a remarkable number of agencies and institutions engaged in studying these problems, the chances of interference, overlap, and duplication are obvious.²³⁹ While various institutions in each country attempt to coordinate national approaches to Great Lakes problems, there is as yet no formal machinery for such coordination at the international level. The IJC has played an important informal role in this respect, particularly through the operation of its joint technical boards. Since the members of these boards are drawn from a variety of federal, state, and provincial agencies,²⁴⁰ the boards serve to bring responsible officials at these levels from the United States and Canada into continuing face-to-face contact in a context which facilitates the free flow of information and views among them. Presumably, some informal coordination results. Indeed, the boards have in large part been able to perform their tasks through collecting and assessing relevant work already done by the various official agencies and other institutions in both countries; typically, relatively little new research has been required.²⁴¹

Nevertheless, the IJC's role has remained informal, and the recent

238. *Id.* at 4-5, 11, 26-40.

239. *See, e.g.*, the references to these problems in the IJC LOWER LAKES REPORT, *supra* note 10, at 108, 110-11. The Commission comments that

[w]hile in some cases the differences among jurisdictions are more apparent than real, in others the differences are such that the laws as applied in the various jurisdictions are incompatible. Obviously such inconsistency presents serious obstacles to the effective implementation of any concerted programme of pollution control and abatement throughout the Lower Great Lakes.

Id. at 110. It cites as an example of this incompatibility the differing legal requirements for the control of waste discharges from watercraft using the Lakes. *Id.*

240. *See, e.g.*, the list of members of the International Lake Erie Water Pollution Board and the International Lake Ontario-St. Lawrence River Water Pollution Board, and of their respective committees, in the Appendix of the IJC LOWER LAKES REPORT, *supra* note 10, at 165-67.

241. For example, in 1960, prior to the Commission's receipt of the Lower Lakes Reference, Congress had already appropriated funds under the Federal Water Pollution Control Act of 1956, 33 U.S.C. §§ 1151-75 (1970), for a comprehensive study of Great Lakes pollution problems, and that study was already in progress at the time of the Reference. IJC LOWER LAKES REPORT, *supra* note 10, at 8. Additional research for the Lower Lakes study was conducted by the responsible government agencies of the two governments rather than by the Commission itself. *Id.* at 8-9. *See* note 111 *supra* and accompanying text.

Ministerial Conference was apparently the first effort at a concerted and sustained high-level official discussion and exchange of views on Great Lakes pollution problems. In the IJC's Lower Lakes Report, which formed a basis for the Ministers' discussions, the Commission noted:

In order to achieve effective pollution control and acceptable water quality in these boundary waters, the policies and laws of the several jurisdictions concerned must have a common goal and the programmes to achieve that goal need to be coordinated with the programmes of the other jurisdictions involved in the lakes. Otherwise, efforts put forth in one jurisdiction may be frustrated either by inaction or by inconsistent action in another jurisdiction. Water quality surveillance and monitoring to assess the effectiveness of control measures undertaken or the need for additional measures also need to be coordinated with similar activities in the other jurisdictions if meaningful results are to be obtained. A high degree of cooperation and a free exchange of relevant data and information among all jurisdictions concerned are essential elements of an effective programme to achieve and maintain a satisfactory water quality in these boundary waters.²⁴²

With the conclusion of the proposed Agreement and the Commission's strengthened mandate to promote coordination, more formal arrangements for coordination might be considered. One likely mechanism for such coordination might be the joint Great Lakes pollution advisory board suggested by the Ministers; this board would operate under the Commission but would include responsible officials from all concerned planning, research, and operating agencies. Alternatively, institutions other than the IJC might be used for this purpose. Thus, coordination might be sought, with respect to planning, through some type of "internationalized" Great Lakes Basin Commission; with respect to research, through an expanded Great Lakes Study Group; and in the area of actual policy-making, regulation, and implementation, through the establishment of a new high-level joint United States-Canadian inter-agency committee on Great Lakes pollution, which would in effect continue on a permanent basis the work of the Ministerial Conference.

In pursuing the goal of coordination, some caution may be called for. Clearly, coordination is desirable in certain areas; there is little point in different jurisdictions or groups working at cross-purposes. As the Commission suggests, coordination may also be essential to the operation of an effective monitoring and surveillance program. Moreover, a free exchange of data and information, perhaps with

242. IJC LOWER LAKES REPORT, *supra* note 10, at 111. See also *id.* at 130-31.

centralized storage and retrieval capabilities, cannot fail to provide mutual benefits. Finally, coordination may serve the function of identifying and filling gaps in research or action programs. On the other hand, coordination has its own costs and may even prove dysfunctional to the extent that it results in inflexible determinations of priorities, the stifling of competitive research, or an unwillingness to experiment with new approaches. Some overlapping, duplication, inefficiency, and even a testing of inconsistent techniques may be unavoidable in constructive attempts to solve a problem as complex as that of Great Lakes pollution.

G. Implementation

A major problem of international cooperation in the environment as in other fields is that of implementation. United States-Canadian experience supports this judgment. The IJC has no direct authority either to implement or to enforce its recommendations. The recommendations come to the governments by way of the Commission's formal reports and are typically distributed to concerned agencies within each government for comments. In the absence of strong objection from within either government they are routinely "approved." However, there is no obligation upon either government actually to implement the Commission's recommendations even if approved, and their subsequent impact is hard to determine.

Until recently, there was apparently no established procedure within the United States government for either feeding IJC recommendations into regular policy-making channels or ensuring that they were carried out. Traditionally, the State Department, through the Assistant Secretary of State for European Affairs, has carried primary authority for working with the Commission and taking action on its recommendations. The State Department, however, has little expertise or interest in the technical aspects of pollution problems, has only limited channels of regular communication with agencies that do, and has usually treated IJC matters as of comparatively limited importance and as appropriately handled at relatively low official levels. The Council on Environmental Quality now shares implementing responsibility on certain IJC recommendations concerning environmental matters,²⁴³ and the Council may provide a more interested, technically qualified, and effective United States governmental constituency for the IJC. Canada has traditionally put

243. Information supplied by U.S. government officials.

more emphasis on the Commission and its work, and has apparently accorded its recommendations more status and attention.

In practice, the Commission's influence may be somewhat greater than is suggested above, though the means by which this influence is exerted are principally informal. First, the Commission's reports are significant technical studies that undoubtedly come to the attention of many relevant policy-making officials, and, because of their high quality, may influence official decisions. This influence is, of course, the major purpose of the governments' references and the Commission's work. Second, the reports reflect the work of the joint technical boards, which are themselves composed of influential officials from a variety of concerned agencies of each government. Since these governmental officials are largely responsible for the Commission's recommendations, they will presumably carry over these findings and judgments into their work within their own agencies. Third, the wide publication of the IJC's reports, and also of the interim reports which the Commission has adopted the practice of issuing, may exert some public pressure on officials to take recommended actions, though the extent and impact of these pressures are hard to gauge. As a related technique, the Commission has recently instituted the practice of convening public meetings to acquaint the public with relevant problems and the Commission's recommendations regarding them.²⁴⁴ To a very limited extent, the Commission has communicated with concerned officials, calling their attention to the lack of progress made toward a recommended solution or to particular problems or polluters. On occasion, as in the case in which the Commission called broad public attention to the contribution of phosphorus-based detergents to Great Lakes eutrophication, it has clearly had some effect on public policy,²⁴⁵ though the recent statement by the Surgeon General and by the Administrator of the En-

244. See note 76 *supra*.

245. The Commission's 1969 interim reports on the Lower Great Lakes Pollution Reference, which stressed the role of phosphorus and particularly phosphorus-based detergents in eutrophication of the Lakes, received wide attention and apparently played some part in influencing environmental officials at that time to urge consumers to avoid phosphate detergents. In February 1970 Canada announced plans to ban all phosphates in detergents over a two-year span. *N.Y. Times*, Feb. 20, 1970, at 2, col. 3. A number of states, such as Connecticut, Florida, Indiana, Maine, Minnesota, and New York, and communities such as Dade and Lake counties in Florida, and Chicago, Detroit, and Akron have subsequently passed legislation to regulate the phosphate content of detergents. Most of this legislation is to take effect in 1972 or 1973. Many other states and communities are considering phosphates legislation. See CEQ 1971 REPORT, *supra* note 7, at 44; Madison (Wis.) Capital Times, Sept. 17, 1971, at 6, cols. 1-5.

vironmental Protection Agency, suggesting that housewives should continue to use phosphate-based detergents rather than possibly more hazardous substitutes, indicates that this particular impact may prove short-lived.²⁴⁶

Since implementation of the Commission's recommendations rests with the various national, state, and provincial governments, a brief look at the current situation in regard to measures taken by these entities may be of interest. Broadly speaking, there are considerable differences among the various jurisdictions in the type and extent of relevant legislation and programs, the level of financing, the strictness of water quality standards and other control measures, and the procedures and practical level of enforcement.²⁴⁷ As previously indicated, while the United States federal government has in recent years assumed a growing role in water pollution control programs, primary authority for establishing and enforcing regulations and standards remains in the states.²⁴⁸ The Council on Environmental Quality has noted that, although remarkable progress has been made with respect to the scope of both federal and state legislation and programs in the past five years, standards remain in many respects inadequate and compliance and enforcement leave much to be desired.²⁴⁹ Nevertheless, the federal government appears to have adequate authority under existing legislation to implement both the Commission's recommendations respecting Great Lakes pollution and the provisions of the proposed Agreement. The federal government also clearly has con-

246. See notes 202-03 *supra* and accompanying text.

247. See, e.g., IJC LOWER LAKES REPORT, *supra* note 10, at 108.

248. See § 1(b) of the Federal Water Pollution Control Act, 33 U.S.C. § 1151(b) (1970), which declares that the policy of Congress is "to recognize, preserve, and protect the primary responsibilities and rights of the States in preventing and controlling water pollution"; § 10(b) of that Act, 33 U.S.C. § 1160(b) (1970), which provides that, except when the Attorney General has actually obtained a court order of pollution abatement on behalf of the United States, "State and interstate action to abate pollution of . . . navigable waters . . . shall not . . . be displaced by Federal enforcement action." See also Environment Quality Improvement Act of 1970, Pub. L. No. 91-224, § 202(b)(2), 84 Stat. 114, which, while stating the general policy of Congress in protecting the environment, also states: "The primary responsibility for implementing this policy rests with State and local governments."

For excellent and comprehensive discussions of federal and state water quality legislation and practice, see generally H. ELLIS, J. BEUSCHER, C. HOWARD & J. DEBRAAL, *supra* note 23; Hines, *Nor Any Drop To Drink: Public Regulation of Water Quality, Part I: State Pollution Control Programs*, 52 IOWA L. REV. 186 (1966); *Part II: Interstate Arrangements for Pollution Control*, 52 IOWA L. REV. 432 (1966); *Part III: The Federal Effort*, 52 IOWA L. REV. 799 (1967). For a critical view, see D. ZWICK & M. BENSTOCK, *supra* note 14.

249. See, e.g., CEQ 1970 REPORT, *supra* note 7, at 44. See also D. ZWICK & M. BENSTOCK, *supra* note 14. For several interesting case studies of the problems involved, see, e.g., Polikoff, *The Interlake Affair*, THE WASHINGTON MONTHLY, March 1971, at 7; Reitze, *supra* note 15.

stitutional authority to enact such further legislation in this respect as it deems necessary.²⁵⁰

The principal federal legislation in the water pollution area is the Federal Water Pollution Control Act.²⁵¹ A 1965 amendment to the Basic Act requires the states to establish water quality standards for their interstate waters²⁵² and these state standards can then be approved as federal standards by the Environmental Protection Agency (EPA).²⁵³ The states retain primary responsibility both for drawing up and for enforcing the standards. If the states fail to set standards, the EPA may set and enforce them.²⁵⁴ Currently, the standards of all of the states are "approved," though many of them have serious deficiencies.²⁵⁵ The Act also provides certain federal enforcement mechanisms for abating interstate water pollution, but the procedures are limited and cumbersome.²⁵⁶ It is interesting to note that section 10 (d)(2) of the Act specifically provides that a foreign state affected by interstate pollution may participate in the Act's enforcement conference on the basis of reciprocity;²⁵⁷ Canada, however, has never sought to utilize this procedure.²⁵⁸

250. See note 23 *supra*.

251. 33 U.S.C. §§ 1151-75 (1970).

252. Federal Water Pollution Control Act § 10(c)(1), Act of Oct. 2, 1965, Pub. L. No. 89-234, § 5(a)(1), 79 Stat. 907, *amending* 33 U.S.C. § 466(g) (1964) (codified at 33 U.S.C. § 1160(c)(1) (1970)).

253. The Environmental Protection Agency [hereinafter EPA] has taken over the Secretary of Interior's functions under the Act. Exec. Order No. 11,548, 35 Fed. Reg. 11677 (1970), 33 U.S.C. § 1151 (1970).

254. 33 U.S.C. § 1160(c)(1) (1970). See note 253 *supra*.

255. See, e.g., CEQ 1970 REPORT, *supra* note 7, at 44.

256. Federal Water Pollution Control Act § 10(c)(5), (d)-(g), 33 U.S.C. 1160(c)(5), (d)-(g) (1970). Two basic procedures are provided. The first is a three-step procedure consisting of a conference of federal, state, and interstate water quality agency representatives, a public hearing, and finally court action. 33 U.S.C. § 1160(d)-(g) (1970). Among the conferences convened under the Act are the four-state Lake Michigan Enforcement Conference, which convened in 1968 and focused on the need to protect Lake Michigan from waste heat discharges; the Lake Superior Enforcement Conference, which convened in 1969 and involved, *inter alia*, discharges of taconite tailing into the Lake from a Reserve Mining Company facility in Minnesota; and the Lake Erie Enforcement Conference, which convened in 1970 and studied all forms and sources of pollution affecting Lake Erie. The second enforcement procedure calls for notification of the applicable water quality standards both to the violator and to interested parties, followed by court action if necessary in cases of noncompliance. 33 U.S.C. § 1160(c)(5) (1970). The EPA issued a violation notice to Reserve Mining Company because of its failure to present an acceptable abatement plan to the Lake Superior Enforcement Conference. See CEQ 1971 REPORT, *supra* note 7, at 12-13. Senator Muskie is reported to have noted that there has been almost no enforcement under the Act, with only one case reaching the courts. N.Y. Times, Nov. 3, 1971, at 22, col. 3.

257. 33 U.S.C. § 1160(d)(2) (1970). Similar provisions are contained in the Clean Air Act § 115, 42 U.S.C. 1857 (1970).

258. Canada does not have reciprocal legislation, and, in any event, may view the

In addition to authority exercised under the Federal Water Pollution Control Act, the federal government has recently initiated an important program under the authority of the Rivers and Harbors Appropriation Act of 1899,²⁵⁹ which makes permits mandatory for all industrial discharges into navigable waters of the United States.²⁶⁰ Other federal legislation provides for federal control of water pollution in various special contexts (such as oil pollution and pollution from vessels), authorizes extensive federal financial and technical assistance to state and local water pollution control programs, and supports federal efforts in the field of research and development, monitoring, and surveillance.²⁶¹ The Administration is presently

language of § 10(d)(2) giving it "the rights of a state water pollution agency" as unacceptable in terms of its national dignity.

259. 33 U.S.C. §§ 403-04, §§ 406-09, §§ 411-16, § 418 (1970). The Act makes it unlawful, without a permit, to ". . . throw, discharge, or deposit . . . any refuse matter of any kind or description whatever other than that flowing from streets and sewers and passing therefrom in a liquid state, into any navigable water . . . or into any tributary of any navigable water . . ." 33 U.S.C. § 407 (1970). Knowing violation of the Act is a misdemeanor, subject to a \$2500 fine or six months imprisonment. Violators are also subject to civil suits for injunctive relief. The Act was upheld and broadly interpreted by the Supreme Court in *United States v. Republic Steel Corp.*, 362 U.S. 482 (1960).

260. On December 23, 1970, the President announced a new program to control water pollution from industrial sources through the permit authority of the Rivers and Harbors Appropriation Act. Exec. Order No. 11,574, 3 C.F.R. 188 (1970). See *N.Y. Times*, Dec. 24, 1970, at 1, col. 1. See also Dept. of Army Corps of Engrs. Proposed Reg. § 209.131, 35 Fed. Reg. 20005 (1970); *id.*, 36 Fed. Reg. 983 (1971). Violators of water quality standards—including standards imposed by the EPA when federal-state or state standards do not apply or are clearly deficient—are ineligible for permits and liable for enforcement proceedings. All dischargers were required to file information on discharges by October 1, 1971. See, e.g., CEQ 1971 REPORT, *supra* note 7, at 10-12; Rodgers, *Industrial Water Pollution and the Refuse Act: A Second Chance for Water Quality*, 119 U. PA. L. REV. 761 (1971).

But see the recent opinion of the U.S. District Court for the District of Columbia in *Kalur v. Resor*, Civil No. 1331-71 (D.D.C., Dec. 21, 1971), ruling that under the Act all discharges into nonnavigable waters are illegal and that the government may not even issue permits for navigable waters unless it first prepares an environmental impact statement for each permit application. The ruling, if it stands, may raise questions as to the administrative practicability of the present permit program. See *TIME*, Jan. 10, 1972, at 61-62.

261. Much of this legislation is in the form of amendments to the Federal Water Pollution Control Act—for example, the Water Quality Improvement Act of 1970, Pub. L. No. 91-224, 84 Stat. 91, approved April 3, 1970, which embodies comprehensive federal legislation covering the control of vessel wastes. Section 5(f) of the Federal Water Pollution Control Act, 33 U.S.C. § 1155(f) (1970), specifically directs the Secretary of the Interior (now transferred to the Administrator of the EPA) to "conduct research and technical development work, and make studies, with respect to the quality of the waters of the Great Lakes." Section 15 of the Act, 33 U.S.C. § 1165 (1970), authorizes the Secretary (the EPA), in cooperation with other government agencies, to enter into agreements with state or other public agencies, with the federal government paying up to 75% of the costs

to carry out one or more projects to demonstrate new methods and techniques and to develop preliminary plans for the elimination or control of pollution, within all or any part of the watersheds of the Great Lakes. Such projects shall

seeking broader authority in this area, including authority to require states to set specific effluent discharge requirements, and is seeking congressional approval of legislation providing six billion dollars of federal funds to support a twelve billion dollar total national program; a significant portion of these funds will be directed toward the Great Lakes.²⁶² At the present time even more far-reaching legislation is under consideration by Congress.²⁶³

Each of the Great Lake states has its own water control legislation, programs, and agencies; and these differ substantially in breadth and effectiveness.²⁶⁴ In general, during the past several years

demonstrate the engineering and economic feasibility and practicality of removal of pollutants and prevention of any polluting matter from entering into the Great Lakes in the future and other abatement and remedial techniques which will contribute substantially to effective and practical methods of water pollution elimination or control.

33 U.S.C. § 1165(a) (1970). See generally HOUSE COMM. ON PUBLIC WORKS, 91ST CONG., 2D SESS., LAWS OF THE UNITED STATES RELATING TO WATER POLLUTION AND ENVIRONMENTAL QUALITY (Comm. Print 1970).

262. See President Nixon's Message to Congress, Feb. 8, 1971, Program for a Better Environment, H.R. Doc. No. 92-46, 92d Cong., 1st Sess. (1971), set out in CEQ 1971 REPORT, *supra* note 7, at 284-305. See also Joint Communique, *supra* note 1, ¶ 16.

263. On November 2, 1971, the Senate approved 86-0, a far-reaching and comprehensive 180-page bill, The National Water Quality Standards Act of 1971, sponsored by Senator Muskie and approved by the Senate Public Works Committee, which was designed to eliminate the discharge of all pollutants into navigable waterways by 1985 and in large measure to shift responsibility for controlling water pollution from the states to the federal government and the Environmental Protection Agency. S. 2770, 92d Cong., 1st Sess., 117 CONG. REC. S. 17464 (daily ed. Nov. 2, 1971). This bill would, *inter alia*, broaden the 1899 Rivers and Harbors Act by establishing federal effluent or discharge standards; by extending the ban on dumping without a permit to municipal wastes, industrial wastes discharged into sewer systems, outfalls into the ocean, and agricultural wastes for livestock over certain numbers on an acre of land; and by transferring the permit system from the Army Corps of Engineers to the EPA. The bill would permit the states to administer the permit programs once the EPA approved their programs for achieving federal effluent standards, but the EPA could cancel the state's authority to issue permits if the state did not administer its program in conformity with federal law. Moreover, the EPA could veto any state permit and also take a violator to court if the state failed to act against him. The bill contemplates a two-phase program to achieve the national no-discharge standard. Under phase one, cities must have secondary treatment plants for sewage under construction by 1974, and industries must be using the "best practicable control technology" by 1976. Under phase two, to be in force by 1981, all industries and communities, if they have been unable to achieve the goal of no discharge at reasonable cost, must be able to demonstrate that they are at least using the "best available technology." The burden of proof is on the cities and industries. The bill would also authorize \$14 billion for sewage treatment construction grants for fiscal 1972-1975 and increase the percentage of federal sewage treatment plant construction aid. See N.Y. Times, Nov. 3, 1971, at 1, col. 10. See also BNA ENVIRONMENT REP., CURRENT DEVELOPMENTS 719-20 (1971); N.Y. Times, Nov. 8, 1971, at 1, col. 4.

264. For a listing of the principal current water pollution control laws of the various Great Lakes riparian states, and a collection of the relevant state rules, regulation, standards, and criteria, see BNA ENVIRONMENT REP., STATE WATER LAWS (2 vols.). See also J. DAVIES, *supra* note 185, at 120-25; GREAT LAKES INSTITUTIONS, *supra* note 10, at 26-38; Hines, *Nor Any Drop To Drink: Public Regulation of Water Quality, Part I: State Pollution Control Programs*, 52 IOWA L. REV. 186 (1966).

there has been a tendency toward rationalization of pollution control administration and a strengthening of legislation.²⁶⁵ The states clearly have legal authority to enact legislation and standards implementing the Commission's recommended objectives if they so desire. It is interesting to note that the Great Lakes states have enthusiastically backed the concept of an international Great Lakes Water Quality Agreement and of a strengthened IJC,²⁶⁶ perhaps partly in the hope that "internationalizing" the problem will increase the likelihood of more extensive federal funding.

The Canadian federal government has also recently legislated extensively in the area of water pollution, though primary responsibility in this regard remains in the Province of Ontario. As previously indicated, there is apparently some question among Canadian constitutional experts about the permissible reach of Canadian federal power with respect to the broad regulation of Great Lakes pollution, even pursuant to treaty; it has been argued that provincial authority may be, for the most part, paramount in this field.²⁶⁷ These doubts buttress the likelihood that the Province of Ontario will carry the major burden of implementing the IJC's recommendations and the provisions of the proposed Agreement. The Joint Communique

265. See, e.g., the recent Illinois Environmental Protection Act, H. Bill No. 3788, Ill. Laws of 1970 (1 BNA ENVIRONMENT REP., STATE WATER LAWS 766:0101-09); New York Environmental Conservation Law, ch. 140, N.Y. Laws of 1970 (2 BNA ENVIRONMENT REP., STATE WATER LAWS 861:0081-90); Pennsylvania Department of Environmental Resources Law, Act No. 275, H. Bill No. 2213, Pa. Laws of 1970, effective Jan. 19, 1971 (2 BNA ENVIRONMENT REP., STATE WATER LAWS 891:0051-54). See generally CEQ 1970 REPORT, *supra* note 7, at 50; CEQ 1971 REPORT, *supra* note 7, at 170-75.

266. The Environmental Conference of Great Lakes Governors and Premiers, meeting at Mackinac Island, Michigan, August 16-17, 1971, adopted resolutions strongly supporting the proposed Agreement. See N.Y. Times, Aug. 18, 1971, at 62, cols. 1-2. The resolutions commended the proposal to extend the IJC's surveillance responsibilities to Lakes Huron and Superior (Res. No. 1); supported the establishment of a single IJC Water Quality Board for all of the Great Lakes (Res. No. 2); urged that the new Agreement provide the IJC with an independent staff and allied resources (Res. No. 3); and recommended that the role of the IJC be strengthened by authorizing its Water Quality Board to monitor the effectiveness of governmental water pollution control programs, to recommend legislative and program improvements as warranted, to coordinate water quality control activities, to direct specific recommendations relative to individual waste discharges to appropriate water pollution control agencies, and to make public its finding and recommendations (Res. No. 4). Other resolutions included a recommendation that national governments expand current programs to provide financial assistance to aid communities to construct facilities to abate water pollution from combined sewer overflows (Res. No. 6); recommendation of the implementation of a no-discharge concept for sewage from vessels in the Great Lakes and the retention of all sewage for discharge at approved land treatment facilities (Res. Nos. 7 and 11); acknowledgement of the importance of shoreland management policies and control programs (Res. No. 5); and recommendation of the establishment of a Michigan-Ontario committee to prepare a proposal for a cooperative program for abatement of transboundary air pollution (Res. No. 9). Copy of Resolutions, supplied by Office of the Governor of Wisconsin, on file with the *Michigan Law Review*.

267. See note 25 *supra* and accompanying text.

indicates that the Canadian government contemplates that a federal-provincial agreement will be entered into for this purpose.²⁶⁸

The major Canadian federal legislation in this area is the Canada Water Act of 1970.²⁶⁹ The Act provides a framework for federal-provincial planning and cooperation. Among other things it provides for the creation of joint water quality management agencies for waters designated for such treatment by the federal and provincial governments. These agencies would be empowered by regulation to set water quality standards and to implement programs to achieve these standards. With regard to international waters and boundary waters, it is provided that if provincial cooperation cannot be achieved, the federal government itself may designate the waters, establish the agencies and standards, and implement the programs.²⁷⁰ Other federal legislation is applicable to particular aspects of Great Lakes pollution problems.²⁷¹

The responsibilities of the Province of Ontario respecting Great Lakes pollution are exercised principally under the provisions of the Ontario Water Resources Commission Act.²⁷² The Act establishes the Ontario Water Resources Commission and gives it broad jurisdiction over provincial water management. The Act generally prohibits any pollution that might impair the quality of the water in the Province and empowers the Ontario Commission to seek injunctions against and prohibit such activities. In addition, the Commission is authorized to construct treatment facilities for municipalities, investigate water pollution and its causes, make regulations prescribing standards of water quality, set operating standards for sewage works, and make rules for discharges of wastes from boats. In general, the Ontario Water Resources Commission has adopted strict standards and broad programs, compatible with those recommended by the IJC, and is enforcing them vigorously.

The proposed Agreement is in effect a formal endorsement of the Commission's recommendations in its Report on the Lower Lakes Reference and lifts these recommendations to the level of an international obligation. As such, the probabilities of compliance by the governments will be greatly enhanced. Nevertheless, the Joint Communique makes clear that the Commission will not be vested with

268. Joint Communique, *supra* note 1, ¶ 15.

269. CAN. STAT. c. 52 (1969-1970). The Act is briefly described in the IJC LOWER LAKES REPORT, *supra* note 10, at 109.

270. Canada Water Act, CAN. STAT. c. 52, § 5(2) (1969-1970).

271. See, e.g., the Navigable Waters Protection Act, CAN. REV. STAT. c. 41 (1952); Canada Shipping Act, CAN. REV. STAT. c. 29 (1952), as amended, STAT. CAN. c. 34, vol. I, § 25 (1956); Fisheries Act, CAN. REV. STAT. c. 119 (1952).

272. ONT. REV. STAT. c. 281 (1960).

any new powers in the area of enforcement. The Communique states:

While the International Joint Commission would aid the Governments by providing an independent overview and other assistance, the various agencies of the Federal, State and Provincial Governments would continue to implement the programs and measures required to achieve the water quality objectives.²⁷³

However, the Commission's prestige and informal influence on both governments and polluting municipalities and enterprises will presumably increase.

IV. PROSPECTS AND PROBLEMS

To attempt any detailed assessment of the proposed Agreement at this time, before its negotiation is even completed, would clearly be premature. However, some comments might be ventured regarding both the Agreement's general significance and the longer-term prospects for American-Canadian Great Lakes cooperation.

The proposed Agreement would clearly constitute a major accomplishment. It represents a significant advance in United States-Canadian efforts to control Great Lakes pollution and an important addition to broader global experience in international environmental cooperation. The Agreement expressly recognizes the problem of Great Lakes pollution as a major and independent subject of United States-Canadian concern rather than as an adjunct of other water problems and reflects firm national commitments by both governments to take urgent and effective measures to solve the problem. It emphasizes the fact that these governmental commitments are a matter of international as well as national obligation, provides technical criteria by which the extent of each government's compliance can be determined, and thereby buttresses the pressures within each country for adoption of meaningful pollution control programs. Moreover, it reflects a more comprehensive, integrated and "basin-wide" approach to Great Lakes pollution problems than has previously been taken. Finally, the Agreement serves to strengthen considerably the IJC's international institutional role by recognizing the Commission as the primary intergovernmental agent, coordinator, and overseer for all Great Lakes pollution control programs. It can be expected that the IJC's effectiveness with respect to its monitoring, surveillance, and coordinating activities will increase; that its recommendations will carry added weight; and that, through such devices as regular public reports, it will be in a position to exert growing pressure for effective government action.

²⁷³ Joint Communique, *supra* note 1, ¶ 12.

Yet, without discounting the considerable achievement the Agreement represents, it must still be asked whether this step goes far enough—whether even the new Agreement is likely to prove a sufficient answer to the complex and pressing problems of Great Lakes pollution. The IJC has conducted a number of Great Lakes pollution studies in the past twenty-five years and the two governments already have instituted a number of separate and joint Great Lakes pollution control programs. But, despite those measures, the process of Great Lakes deterioration has continued and indeed seems to grow worse. And in substance the new Agreement is simply “more of the same,” representing only a relatively limited departure from the past. The Agreement, in concept and structure, is still primarily a matter of binational cooperation rather than international regulation. The choice of specific standards and techniques for meeting the international water quality objectives remains firmly in each government’s discretion, and procedures for inducing international compliance are weak. Existing IJC powers are strengthened, but the role of the Commission and the scope of cooperation continue to be limited to monitoring, surveillance, and coordination; the key functions of implementation, enforcement, and funding are solely in the governments’ hands. Presumably, each government will continue to be free to ignore Commission recommendations and to check any Commission activities that prove embarrassing to government policies.

There have been many suggestions that something more—some different, more innovative and far-reaching approach—is needed.²⁷⁴ The range of possibilities is obviously broad. Some of these possibilities include simple expansion of the IJC’s authority, while essentially retaining the existing Treaty framework. For example, the IJC could be given at least limited powers to establish pollution standards, to approve or license particular waste disposal facilities, and to initiate complaints of noncompliance before the courts or agencies of either country. Other more far-reaching possibilities might involve abandoning the present framework of limited cooperation and establishing in its place a supranational Great Lakes Authority, exercising direct and comprehensive investigatory, planning, regulatory, and enforcement powers over all aspects of Great Lakes environmental problems. Conceivably, the Authority might administer and allocate

274. See Jordan, *supra* note 35, at 300-01; L. Craine, Development and Use of the Great Lakes: Policy and Institutional Needs (presentation to the Great Lakes Panel of the National Council on Marine Resources and Engineering Development at Symposium held in Ann Arbor, Michigan, Oct. 29-30, 1968), on file with the *Michigan Law Review*. See also Heeney, *supra* note 35, at 6; C. Ross, *supra* note 35, at 8. For a broad survey of relevant problems and experience, see A. KNEESE & B. BOWER, *supra* note 14.

a substantial pollution control fund, financed by mandatory contributions from the two governments or through special taxes or effluent charges on polluting enterprises. It might even enforce its rules through a special international tribunal. International and federal experience suggests a number of models for broader experiments in Great Lakes regulation, such as the European Coal and Steel Community,²⁷⁵ the Tennessee Valley Authority²⁷⁶ and the Delaware River Basin Commission.²⁷⁷ Such proposals for granting the IJC broad regulatory powers or for establishing some type of supranational Great Lakes agency might, of course, raise constitutional problems for each government.²⁷⁸

There is much validity in the argument that effective solutions to Great Lakes pollution problems may ultimately require a more broad-ranging international approach than the present structure and authority of the current Commission, or even of the Commission under the proposed Agreement, permits. Great Lakes pollution is but one aspect of a total Great Lakes Basin ecological and social system and cannot be dissociated from the complex and interrelated web of physical, hydrologic, geographic, demographic, economic, cultural, and political factors which together define and comprise that system. For example, approaches in terms of separate programs aimed at individually controlling water pollution, air pollution, or land use management make little sense when measures taken in one area inevitably affect the others. The establishment of a supranational Great Lakes Authority would permit a rational, comprehensive, integrated,

275. Established by a Treaty signed at Paris, April 18, 1951, effective July 23, 1952, 26 U.N.T.S. 140, 1 EUROPEAN Y.B. 359 (1955). See L. LISTER, EUROPE'S COAL AND STEEL COMMUNITY (1960); H. MASON, THE EUROPEAN COAL AND STEEL COMMUNITY (1955).

276. See, e.g., D. LILIENTHAL, TVA: DEMOCRACY ON THE MARCH (20th anniv. ed. 1953); C. PRITCHETT, THE TENNESSEE VALLEY AUTHORITY: A STUDY IN PUBLIC ADMINISTRATION (1943).

277. The Delaware River Basin Commission is a federal-state agency, established by the Delaware River Basin Compact between Delaware, New Jersey, New York, Pennsylvania, and the United States, consented to by Congress by Act of Sept. 27, 1961, Pub. L. No. 87-328, 75 Stat. 688. The text of the Compact, together with congressional conditions and reservations to consent, is set forth in H.R. Doc. No. 319, 90th Cong., 2d Sess. 95-127 (1968) (Documents on the Use and Control of the Waters of Interstate and International Streams). The Commission reviews all projects that might have a substantial effect on the resources of the Delaware River Basin and, as part of this review, requires that any project affecting water quality must conform to applicable water quality standards. See generally the Commission's Annual Reports; A. KNEESE & B. BOWER, *supra* note 14, at 274-81; Grad, *Federal-State Compact: A New Experiment in Co-operative Federalism*, 63 COLUM. L. REV. 825 (1963); Hines, *Nor Any Drop To Drink: Public Regulation of Water Quality, Part II: Interstate Arrangements for Pollution Control*, 52 IOWA L. REV. 432, 454-55 (1966).

278. These questions would involve not only issues of delegation of national and state or provincial power to an international authority but also the differing complexities of U.S. federal-state and Canadian federal-provincial relations. Cf. P. HAY, FEDERALISM AND SUPRANATIONAL ORGANIZATIONS, PATTERNS FOR NEW LEGAL STRUCTURES ch. 6 (1966).

and coordinated approach to these problems in accord with modern concepts of "problem-shed" management; it would eliminate the recurrent problems of jurisdictional conflict, duplication, and lack of coordination, which trouble present international efforts; and, finally, it would encourage effective decision-making in a sufficiently broad context to permit a more complete analysis and balancing of policy alternatives and thus the determination of optimal solutions.²⁷⁹

While the concept of a supranational Great Lakes Authority has considerable intellectual and dramatic appeal, it seems unlikely that any such agreement will be achieved in the near future. Indeed, there is much to suggest that the proposed Agreement represents the practical limits that United States-Canadian cooperation can at present hope to reach, and that attempts to go further in the direction of international or supranational regulation might be unrealistic, unnecessary, and even potentially harmful.

First, neither the United States nor Canada seems presently interested in broad regulatory schemes. There are many reasons for this attitude. Important differences remain between the governments concerning their respective share of responsibility for Great Lakes problems and the burdens each should properly assume. The economic stakes of pollution control and the balance of internal political pressures acting upon the governments are still uncertain.²⁸⁰ Furthermore, the potential costs involved in such programs are extremely high.²⁸¹ In this context neither government appears prepared to relinquish control over relevant decisions affecting significant national interests or to reduce its broad options to respond flexibly to developing situations. Thus, the relatively limited reach of the proposed Agreement may reflect not a lack of imagination—both governments have been well aware of the possibility of broader arrangements at least since the tabling of the Commission's draft Convention in 1920—but political realism.

Second, any considerable expansion of the IJC's regulatory power

279. See, e.g., Hines, *Nor Any Drop To Drink: Public Regulation of Water Quality, Part II: Interstate Arrangements for Pollution Control*, 52 IOWA L. REV. 432 (1966): Conditions of water pollution . . . frequently assume a configuration that bears little resemblance to the political geography of any of the states affected. Great acumen is not required to realize that little success is likely to accrue to attempts to regulate pollution of interstate waters unless the control effort has a scope of planning and an enforcement authority roughly congruent with the dimensions of the problem. The vesting of regulatory power in some form of supra-state organization seems essential to effective handling of pollution situations, the causes and effects of which overflow state lines.

See also L. Craine, *supra* note 274, at 13.

280. See generally J. DAVIES, *supra* note 185, for a survey of the political and administrative context of present U.S. efforts to deal with pollution problems.

281. See text accompanying note 126 *supra*.

or the creation of a new Authority would probably require either development of a new treaty or substantial amendment of the 1909 Treaty. The negotiation of such a treaty or amendment would be complex, difficult, and time-consuming, with no guarantee of results. In contrast, the proposed Agreement retains and exploits the remarkable flexibility of the present Treaty and has been comparatively easy to achieve. Moreover, it builds on established traditions and experience which have in the past proved relatively successful. In this respect, there seems to be wisdom in the adage "let well enough alone."

Finally, the proposed Agreement appears in accord with the present level of real needs and cooperative possibilities between the two governments. It commits the governments to new levels of cooperation in areas in which the immediate pay-offs from such cooperation seem highest and the risks to the governments lowest: monitoring, surveillance, technical recommendation, and coordination. Moreover, the Agreement is relatively open-ended, and it does not preclude the taking of more far-reaching measures should further experience suggest their desirability. Indeed, the Commission will presumably now be in a position to give sustained and expert study to suggestions for further institutional change, and, if it considers it desirable, to recommend that change to the governments.

As to the directions of future development of the United States-Canadian Great Lakes cooperation, certain broad trends are possible to predict. First, as the IJC's responsibilities grow in importance and it begins to deal with issues more central to government concern, the Commission may become more political in character. Each of the governments will now follow its work more closely and may appoint Commissioners who will reflect or be more responsive to their government's attitudes and policies. Second, there may well be an increasing movement toward treating Great Lakes problems on a regional basis—dealing with the entire basin as a single research planning, coordinating, and management unit. This tendency is already evident in the trend toward basin-wide references, the probable appointment of a single continuing pollution advisory board for all of the Lakes, and in initial efforts to coordinate the work of the Commission's separate water and air pollution boards.²⁸² In this connection, American-Canadian Great Lakes cooperation may ex-

²⁸² At its spring 1971 semiannual meeting, the IJC requested its various boards that deal with water pollution to initiate a liaison with the International Air Pollution Advisory Board in order to ensure that control measures for one type of pollution would not nullify control measures for another. (Information supplied by IJC, U.S. Section.)

pand into the field of long-range planning.²⁸³ Third, the Commission, with a strengthened staff and the additional prestige of its new status and responsibilities under the new Agreement, may exhibit more aggressiveness than in the past, both in terms of the strength of its reports and recommendations and in terms of its efforts to cultivate a binational public constituency. Finally, if the Agreement proves relatively successful, the two governments may be prepared to buttress and perhaps increase the Commission's authority.

Expansion of the Commission's powers and procedures might take various directions.²⁸⁴ Thus, it might include authority for the Commission to initiate investigations, or at least to petition the governments for particular references; broader Commission authority respecting issuance of subpoenas and the holding of public hearings; or perhaps authority for informal Commission investigation of local problems of immediate concern on its own initiative and without the necessity for invoking cumbersome and time-consuming reference procedures. The Commission might be given greater power to initiate, and perhaps participate in, proceedings against polluters in the national courts and agencies of the two countries. Formal channels of communication between the Commission and national policy-making and enforcement authorities in each country might be strengthened. The Commission might also be given some role as a forum for "preventative diplomacy" respecting environmental problems, perhaps through the institution, under Commission auspices, of "confrontation" procedures under which either of the two governments could require the other to consult about proposed environmental measures that could significantly affect it.²⁸⁵

283. The Chairman of the Great Lakes Basin Commission, reviewing the Advisory Board's Lower Lakes Report with the Council on Environmental Quality, stated:

Effective management of Great Lakes resources requires a comprehensive, coordinated joint effort in both operation and planning on both a short- and long-range basis. This approach is not to be confused with the artificial stapling together of a number of independently arrived at, single-purpose plans and operations agreements. Our present problems are largely a result of this approach. Their solution surely does not lie in its continued application.

Great Lakes Basin Commn. Communicator, March 1971, at 6.

284. See, e.g., the suggestions in Jordan, *supra* note 35, at 300-01.

285. Compare the proposal for such "confrontation" procedures made at the March 1971 meeting of the Organization for Economic Cooperation and Development's (OECD) Environmental Committee, OECD Observer 10 (No. 52, 1971), as discussed in Stein, *The Potential of Regional Organizations in Managing Man's Environment*, in LAW, INSTITUTIONS AND THE GLOBAL ENVIRONMENT, *supra* note 5, manuscript at 16. That a consultation procedure would find ample use is suggested by the Canadian reaction to the recent U.S. "Cannikin" underground nuclear test on Amchitka Island, Alaska, which occasioned protests by the Canadian Prime Minister, Secretary of State for External Affairs, Minister of the Environment, and Ambassador to the U.S.; the adoption on October 15, 1971, by the Canadian House of Commons, with only one dissenting vote, of a resolution condemning the test; and mass demonstrations in

Each government now has the capability—technical, economic, and legal—to do what is required to control Great Lakes pollution. Thus, the success or failure of efforts to control Great Lakes pollution will depend ultimately not on what the new Agreement says or what the IJC does, but on what the two governments themselves choose to do; the outcome will depend upon their willingness to adopt the necessary national legislation and standards, to implement these programs through effective judicial and administrative enforcement, and to provide the substantial funds required. What the governments choose to do will, in turn, depend largely on shifting public attitudes and the eventual outcome of the clash of complex competing political and economic forces now operating upon relevant governmental environmental policies in each country.

In this respect, it may be unrealistic to project more than moderate optimism. There are signs, at least in the United States, that the present wave of public environmental concern may be diminishing and that politicians may be perceiving the "environmental issue" as having less practical political impact than previously assumed. Enthusiasm for stringent pollution controls has lessened as it has become increasingly evident to both the public and politicians that effective pollution control will be inconvenient, costly, slow to produce results, and detrimental to particular industries and communities. Countervailing pressures by special interests affected by possible control programs are growing, and under these pressures government attitudes are becoming increasingly ambivalent.²⁸⁶ If these pressures increase the course of least resistance for government policy-makers may be programs and levels of funding that give the appearance rather than the reality of effective action.

The IJC's role in working out these economic and political conflicts will be inherently limited. Its influence, however, will continue to be felt in at least two ways. First, the governments, in making their policies and decisions in this area will inevitably have to take into account the relevant scientific data and technical assessments concerning the facts of Great Lakes pollution that are supplied by the Commission, and they will hopefully make sounder decisions because

Canada. See, e.g., Wall St. J., Oct. 28, 1971, at 1, col. 3; Washington Post, Oct. 28, 1971, § A, at 1, col. 1; N.Y. Times, Nov. 3, 1971, at 29, col. 1.

286. See generally D. ZWICK & M. BENSTOCK, *supra* note 14. For some recent indications of such pressures, see Kenworthy, *Efforts To Place Limits on Environmental Agency*, N.Y. Times, Aug. 6, 1971, at 33, cols. 5-8; Wall St. J., Sept. 24, 1971, at 1, col. 5 (reporting that Surgeon General's advice to return to phosphate detergents (*see* notes 202-03 *supra* and accompanying text) followed pleas from industry); N.Y. Times, Nov. 3, 1971, at 1, col. 1, and Dec. 11, 1971, at 54, cols. 1-2 (reporting industry opposition to Senate's approval of bill to clean up waterways, *supra* note 263). For a discussion of competing interest groups, see J. DAVIES, *supra* note 185, at 77-97.

of the availability of these data. Second, by making these facts public, the Commission will exert a continuing public pressure on the governments to live up to their professed commitments and to adopt policies reasonably related to the realities of Great Lakes pollution problems and long-run public needs. The Commission's performance of these functions will in itself represent a substantial contribution, amply justifying continued American-Canadian cooperation.

V. SOME TENTATIVE LESSONS

The cooperative arrangements which the United States and Canada have developed in their efforts to control Great Lakes pollution reflect a particular historical, geographic, and political context, and any attempt at generalization involves risks. Nevertheless, this experience is one of the few examples we have of a relatively complex system of international environmental cooperation and we should try to derive what lessons we can. These lessons, both discouraging and encouraging, might include the following.

First, large-scale environmental problems, such as that of Great Lakes pollution, are extremely difficult to solve. Despite the long history of cooperation in this area, the Lakes continue to deteriorate. The roots of the problems often lie in social forces and attitudes that defy control—exploitative attitudes toward the environment, economic expansion, population increase, and technological change. Our knowledge of the specific causes and effects of environmental deterioration; of the multitude of scientific, technical, economic, sociological, and other factors and complex interactions involved in that deterioration; of the optimal technical and institutional means for remedy; and of the time scales such remedies may require, remains limited, imprecise, and uncertain. The costs of effectively coping with environmental deterioration may be substantial. Finally, alternative patterns of solution may alter existing social and economic patterns in different ways, and various groups may consequently have high stakes in the approach chosen. When environmental issues engage such strongly competing interests, they may transcend mere scientific and technological treatment and become deeply involved in the political process.²⁸⁷

Second, many environmental problems are largely localized, with their causes and effects occurring principally within a single nation or, at most, geographically contiguous nations. These problems must

287. See, e.g., IJC LOWER LAKES REPORT, *supra* note 10, at 129:

Studies are also necessary to find solutions to legislative, legal and enforcement problems related to water pollution. Indeed the solution of some of these complex social problems may well be as difficult and as time consuming as the solution of some of the scientific and technical problems.

necessarily be handled primarily on a national basis, with international measures playing only a supplementary role. Moreover, even when international measures are appropriate, limited bilateral or regional arrangements may often prove more suitable than global approaches. The United States and Canada have consistently regarded the problem of Great Lakes pollution as primarily a matter for solution by national action, with international measures supplementing, buttressing, and coordinating rather than replacing country programs. It is difficult to see how direct involvement by other nations in the problem of Great Lakes pollution could substantially contribute to its solution.

Third, governments will be reluctant to subject their flexibility and freedom of action regarding relevant environmental policies to international constraints. The reasons for this reluctance have been noted; they include the high potential costs of pollution control programs, the uncertainty of their national impact, and their consequent political sensitivity. Governments will therefore enter into international environmental programs only when they are persuaded that these programs offer substantial practical benefits unobtainable by national action alone, or where these programs involve only minimal obligations. Canada and the United States share a deep concern for Great Lakes pollution problems, have cooperated in this area for almost sixty years, and now concede the urgent need for common and joint solutions; moreover, the two countries share common traditions and have relatively close political, economic, and cultural ties. Despite the strength of the factors favoring cooperation, neither government seems yet prepared to delegate substantial powers to the IJC or otherwise limit its national freedom of action in significant ways.

Fourth, since even concerned countries can be expected to be reluctant to accept international environmental constraints, it follows that the price of setting up agreements between or among any but the most strongly concerned countries may be an agreement that is watered-down and ineffectual. The commitments will be reduced to the "lowest common denominator" of the least interested potential party. This factor again suggests that in many contexts bilateral and regional environmental programs, involving only countries with a direct and urgent concern with the problem, may prove more politically attainable, far-reaching, and effective than broader global programs, which may include nations with only marginal interests. Moreover, neighboring or regional states may be more likely to share common values, congenial legal systems, and traditions of cooperation, and these factors will also buttress the chances for successful environmental cooperation.

Fifth, in attempting to deal with international environmental problems, governments often prefer loose cooperative arrangements to techniques of formal legal prohibition. Specific environmental prohibitions will be difficult to agree upon, evidence of violations may be hard to establish, and legal remedies may prove cumbersome and incapable of dealing effectively with broad-scale, complex, and multi-faceted environmental problems, which tend to change over time. Again, the fact that neither the United States nor Canada has sought to utilize the 1909 Treaty's provisions formally banning pollution, and that the two governments resort instead to the more flexible techniques involved in IJC references, strongly support this assertion. Furthermore, if formal treaty arrangements and institutions are established, there are strong arguments for making these arrangements relatively flexible and open-ended, with a capacity to expand and adapt as problems and needs clarify and the parties gain confidence in their cooperative activities. The point is not that the parties need abdicate control over the growth of the authority and activities of such institutions, but that they should plan to permit growth through relatively informal procedures rather than through the difficult, cumbersome, and time-consuming process of formal amendment. The development of American-Canadian environmental cooperation was clearly facilitated by the fact that the IJC was an institution already "in place" and capable of such expanded and innovative use as the two governments wished to make of it.

Sixth, on the more positive side, the possibilities for successful international cooperation with respect to particular environmental problems may be enhanced by a formal acknowledgement of the international character of those problems and of the propriety of their international treatment. While the provision prohibiting pollution in the 1909 Treaty has had little direct application, it has facilitated the subsequent development of international environmental cooperation through the IJC.

Seventh, the United States-Canadian experience demonstrates that international environmental cooperation can yield useful dividends at relatively low costs and with limited political risks. While Great Lakes problems are still a long way from solution, the IJC has performed a valuable function in developing government and public awareness of Great Lakes pollution problems, providing scientific and technical information relevant to rational policy choice, suggesting the nature of the remedies required, and furnishing a means through which national programs can be better coordinated. It has also shown that even partial data may serve sufficiently to identify problems and that even partial programs may be worth pursuing.

Eighth, some of the functions potentially involved in international environmental cooperation, such as monitoring, surveillance, and the presentation of technical objectives and options, seem best performed by institutions acting in a relatively expert and apolitical capacity. The IJC's reputation as an expert impartial body has probably made the American and Canadian governments more willing to use it and give its reports more credibility. The Commission's technique of using joint technical boards, composed of officials drawn from agencies of the participating governments and serving in an expert rather than representative capacity, is particularly suggestive as a method of deploying substantial expertise without incurring the problems of large permanent international staffs and budgets. However, when international cooperative institutions begin to take on policy-oriented tasks, such as coordination, program recommendation, implementation, and enforcement, the possibility and usefulness of a wholly apolitical orientation may become more questionable.

Ninth, even limited patterns of international environmental cooperation may produce useful secondary effects. The IJC's pollution studies have helped to create public pressures for effective government action in both countries, and the proposed Agreement will buttress arguments for greater commitment of government resources to this area. Moreover, the work of the Commission's various expert boards has resulted in continuing contacts and interaction between federal, state, and provincial officials concerned with Great Lakes pollution and has helped to establish important informal channels of communication, coordination, and influence.

Finally, the problem of pollution of the Great Lakes has much in common with similar pollution problems in many other large lakes and enclosed and semi-enclosed seas in other parts of the world, as well as in some of the major international rivers.²⁸⁸ Collectively, these internationally shared water pollution problems comprise a significant segment of the problems that countries are likely to recognize within the next few years as requiring international treatment. International initiatives to promote the exchange of experience in this area, perhaps through periodic international meetings of concerned officials or through the establishment of a small international Secretariat to facilitate exchanges of information on a continuing basis, might be useful and appropriate.

288. See note 178 *supra*. On the problem of Baltic Sea pollution, see A. Sparring, *supra* note 206; Tonselius, *The Stagnant Sea*, 12 ENVIRONMENT, July-Aug. 1970, at 2-11. On the problem of North Sea pollution, see *The Christian Science Monitor*, May 24, 1971, at 2, cols. 1-3. See also the recent report that the Soviet leadership, in a decree by the Central Committee, has called for prompt measures to protect the environment of Lake Baikal, the world's largest fresh water lake. *N.Y. Times*, Sept. 25, 1971, at 4, cols. 3-6.