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The Canadian-American Problem of Acid Rain†

INTRODUCTION

This article addresses the problem of Canadian-American acid rain, urging certain steps that soon must be taken. Many experts are vouchsafing the seriousness of acid precipitation damage,¹ and public spokesmen are fully concerned with the enormous costs of abatement.² But too few of these specialists are considering the daunting questions of independence and intrusion involved in any agreed program of abatement. Presumably the majority must feel that, after seventy-five years' experience of U.S.-Canadian cooperation on projects and coordination of policies, there is no need to plow through the initial legalistic and diplomatic steps that have impeded progress between European countries. In support of this optimistic position, the existence and success of fisheries agreements, convention agencies, and of the International Joint Commission (IJC) under the Boundary Waters Treaty of 1909 are often cited.³ It is argued that if the bilateral fisheries' commission can handle fishery management disputes, and the IJC can recommend how to deal with the pollution of the Great Lakes, there should be a similar type of institution created to deal with acid rain.⁴

This optimism is understandable. But the two nations may not be able to benefit from past experience and, instead, find themselves forced to work out some solution from first principles. A first point, indeed, is that the equitable principles involved in Canadian-American environmental

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1. J. E. CARROLL, *ACID RAIN: AN ISSUE IN CANADIAN-AMERICAN RELATIONS* (1985).

2. *Id.*

3. J. E. CARROLL, *ENVIRONMENTAL DIPLOMACY: AN EXAMINATION AND A PERSPECTIVE OF CANADIAN-U.S. TRANSBOUNDARY ENVIRONMENTAL RELATIONS* (1983).

4. *Id.*

diplomacy are by no means settled. Both countries give lip service to two potentially contradictory principles and have yet to decide which of them should apply to acid rain. One of these is the principle of absolute territorial sovereignty by the upstream or emitting party. The opposite principle is that of external responsibility.⁵ These principles are discussed in the second section of this article. In addition, the two countries should ponder the choice between principles seriously enough that they would be able to base a future program of compensation payments on whatever principle they conclude is relevant.

The "principle of access,"⁶ discussed in the article's third section, might be used to reduce the need for continuous top-level bargaining. This principle calls for each country to admit citizens of the other country to its courts, hearings, tribunals, and political meetings concerned with pollution questions. But because it depends on individual initiative and private response, this principle can be disappointing. Individual argument and pleading under foreign rules cannot get far with acid rain. Perhaps its chief value is that, like the conflict between the two main principles of international equity, it focuses attention on *compensation*.

Fourth, once a principle has been selected, the two countries can use the IJC to help develop and apply it to the acid rain situation. But not before. It would destroy the IJC to ask it to provide or declare the equitable principles on its own. And fifth, the system of marketable international pollution certificates is a better way to choose a principle, organize data collection, make payments, and attain allocative efficiency.⁷

Conceivably this stress on choice of principle is excessively legalistic. It is certainly paradoxical that the author, as an economist, is urging the importance of coming to a sufficient agreement, almost immediately, on sovereignty, property, and equity, while some legal experts are urging the two nations should avoid such legalisms and get on with the coordinated economic management of the North American environment. Starting with a recognition of the continent-wide, if not global, scope of acid rain and realizing that atmospheric circulations do not respect national borders, they argue that a cost-effective pollution reduction system should be based strictly on economic and technical criteria. Following their agenda for internationally coordinated environmental management, the United States and Canada would plan and select the necessary measures by a cosmopolitan version of "benefit-cost" analysis. No project would be selected

5. See generally Scott, *Fisheries, Pollution and Canadian-American Transnational Relations*, in CANADA AND THE UNITED STATES: TRANSNATIONAL AND TRANSGOVERNMENTAL RELATIONS 234-55 (A.B. Fox, A.O. Hero & J.S. Nye eds. 1976).

6. *Id.*

7. See d'Arge & Kneese, *State Liability for International Environmental Degradation: An Economic Perspective*, 20 NAT. RES. J. 427 (1980).

for the total program unless the value of its contribution to damage abatement was greater than its addition to the total program's costs. The nationality of those who benefitted from or paid for the projects, and the geographical location of the abatement projects and of the reduction in environmental damage would be irrelevant for project selection. At each stage the only rule would be that program benefits to *whomsoever they accrue* should be greater than costs *wherever they fall*.

The way for this approach was paved by the early utilitarians whose slogan may be adapted by saying that it would bring something like the greatest good for the most inclusive group of people.⁸ Although it has been attempted on very few international occasions, it has been approximated in the international management of one or two common or jointly-occupied resources: the west coast sockeye salmon, the dam projects on the Columbia and St. Lawrence rivers, and in the evaluation of the tidal power in the Bay of Fundy.⁹

This coordinated management approach seems objective and free from narrow nationalism. If it were followed in dealing with acid rain, the two nations would escape from the legalism of competing principles of sovereignty or liability. But they have never yet been willing to ignore the border. Indeed, some are especially indignant about acid rain just because it is dumped on them by foreigners. Because this feeling exists, it is apparent that rigorous coordinated management is not a fruitful way to start planning. If it is attempted, there will be legalistic and nationalistic delays later on. The best evidence for this belief is found in the history of Canadian-American international undertakings. Only when the two countries had achieved prior agreement about the rights and responsibilities of each of them was it possible to proceed with such regimes of joint management as that under the Boundary Waters Treaty of 1909.¹⁰

Before examining two contending equitable principles, the "solidarity" principle should be touched on.¹¹ Under it, neighboring states should cooperate by keeping each other informed about activities involving their environment that might also have transfrontier effects. One can combine items in the drafts of the U.N. Law of the Sea convention, the U.N. Stockholm Declaration, the U.N. Economic Commission for Europe (ECE)

8. R.C. d'Arge & A.V. Kneese, *Some Legal, Ethical, Economic, and Political Aspects of Transfrontier Pollution* (1982) (paper prepared for conference on the Transboundary Effects of Acid Rain, April 1, 1982, Las Vegas, Nevada).

9. Scott, *International Environmental and Fisheries Pacts*, in *THEORY AND STRUCTURES OF INTERNATIONAL POLITICAL ECONOMY* (T. Sandler ed. 1980); J. KRUTILLA, *THE COLUMBIA RIVER TREATY* (1967).

10. A.D.P. HEENEY, *ALONG THE COMMON FRONTIER: THE INTERNATIONAL JOINT COMMISSION* (1967); P.E. CORBETT, *THE SETTLEMENT OF CANADIAN-AMERICAN DISPUTES* (1937).

11. Scott, *Transfrontier Pollution: Are New Institutions Necessary?*, in *ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, ECONOMICS OF TRANSFRONTIER POLLUTION* 177 (1976).

statement, the Organization for Economic Cooperation and Development's (OECD) recommendations, and other sources to get a "solidarity" list:

Countries must keep each other informed; must confer with each other; must cooperate to prevent and cope with emergency pollution episodes; must not discriminate against each other; must verify and monitor; and (to paraphrase the ECE), must develop without undue delay policies and strategies that will augment existing national measures to combat air pollutants.¹²

Although these policies have occupied much space in international proposals they need not be of concern here, for Canada and the United States have already achieved this kind of solidarity in environmental matters. What further questions of principle must be settled before setting up a program on acid rain?

THE CHOICE BETWEEN PRINCIPLES

The first candidate for the principle underlying an acid rain agreement is territoriality: that the primary right in international law is that of a sovereign state to utilize resources, land, and the environment within its territorial limits without interference from other states. In conflicts concerning the environment, and water and fishery resources, this right can mean that the upstream state has full rights to emit wastes into its environment, to change the levels or flows of rivers, and to fish, to an extent unaffected by these action's consequences downstream. This was the interpretation of current international law held by Canada and the United States before they signed the Boundary Waters Treaty in 1909.¹³ By that treaty they in effect undertook not to behave according to this principle with respect to boundary and transboundary waters at least, and they set up the IJC to oversee an alternative regime. The rights they believed they could have continued to claim in the absence of their treaty, rights which here are referred to as constituting a "territorial" approach, comprise the first contending principle available as the basis for an acid rain agreement.

The second principle, that of external responsibility, is a denial of the first. It is that an upstream state does not possess an unqualified right to use its environment so as to cause harm within another state. It was embodied in the decision of the tribunal in the famous Trail Smelter case of 1941.¹⁴ It is important not just because the tribunal worded its decision

12. ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, ENVIRONMENTAL PROTECTION IN FRONTIER REGIONS (1979).

13. *Id.*

14. (U.S. v. Can.) 3 R. Int'l Arb. Awards 1938 (1941); see generally Rubin, *Pollution by Analogy: The Trail Smelter Arbitration*, 50 OR. L. REV. 254-82 (1971).

as a statement of international law in the inter-war period (in one way or another the case stretched over nearly twenty-five years), but also because whether or not it represented international law at the time, the tribunal did reflect the views of the two governments. Actually the decision was an ambiguous one, because the tribunal wrote that this principle holds in law "when the case is of serious consequence."¹⁵ What did it mean by this qualification?

One interpretation is that a policy of the first state that permits pollution that does not *seriously* injure persons or property in the other country is within the rights of that state.¹⁶ This interpretation recalls the test of "reasonableness" used in the common law. Injury would be "serious" if those who caused it were emitting fumes to an "unreasonable" extent, or if those who were harmed suffered injury beyond what they might "reasonably" have expected. It also suggests that "serious" pollution might be defined by a test of neighborliness. As between adjoining states international law should not be called on over small things; states must expect to suffer to some degree from their neighbor's actions and both must learn to rub along together. This line can be extended to the conclusion that each state must follow a sort of Golden Rule: impose on others only that pollution that you also impose on your own people or territory. It can also be extended to a sort of continentalism: in making the best use of the environment, states should not be tightly constrained by international boundaries.

An alternative interpretation of the Trail Smelter holding, however, leads in the opposite direction, although it seems equally consistent with what the tribunal wrote. It is that the word "serious" was intended to signify that downstream damage would have to be very profound or extensive indeed before a case against an upstream state causing pollution could obtain relief or remedy under the law of nations.¹⁷ The tribunal meant to reassert the first principle, that territoriality is what really matters. States possess full rights to permit activities within their own limits; those rights outweigh the rights of the downstream country to be free from such injury. In any case, the tribunal found that as a matter of fact the injury arising from the fumes from the Trail Smelter was "serious" and recommended the compensation that should be paid.¹⁸ Thus, whatever it meant by serious, the actual decision was the first in a line of declarations of the second principle, that of external responsibility.

Canada and the United States have subsequently conducted their environmental relations sometimes according to the territorial principle, sometimes according to the opposite, neighborliness principle. It is easy

15. 3 R. Int'l Arb. Awards at 1965.

16. *Id.*

17. d'Arge & Kneese. *supra* note 7.

18. 3 R. Int'l Arb. Awards 1938.

to point to some well-known examples of approaches derived from only one of the two principles. For instance, fisheries' disputes usually proceed from the territorial approach. Before any steps can be taken in developing combined operations for halibut, salmon, or the Georges Bank fishery, both countries have first to invest a good deal of time achieving agreement on rights to fishing on or sovereignty over the marine areas concerned. Canada in particular has dedicated the careers of some of its most distinguished public servants to international issues concerned with the Law of the Sea, and this legalistic, territorial approach has seemed acceptable and natural to all Americans and most Canadians.¹⁹

On the other hand, in dealing with pollution issues the two countries have often tended to sidestep the territorial preliminaries. It has instead seemed acceptable and natural to emphasize the ecological and environmental unity of the two countries. For example, even on questions where the legal rights of the parties have not yet been sorted out, there are many experts who recommend that the principle basis for policy be recognition of the connections between the two economic systems, similarities between the policies and procedures of the two governments, and the integrity of their water systems, atmospheres, and natural ecologies.²⁰ For these experts the aim is not to achieve a national territory unviolated by pollution from abroad, but to find policies whereby on both sides of the border similar people are asked to obtain similar environmental quality by making similar sacrifices in the form of controls, foregone employment opportunities, or taxes.

Therefore, the Trail Smelter arbitration did not in 1941 end the era of absolute territorial sovereignty. What it did achieve was a further development of "solidarity," or willingness of the two governments to negotiate together on remedying environmental damage, a willingness already signalled by their cooperation on migratory birds and fisheries matters and especially by the existence of the Boundary Waters Treaty and its instrument, the IIC. But after the Trail Smelter question had receded into the past, the two countries had not yet picked a single principle of international environmental relations. Sometimes one or both had, and has today, unashamed recourse to the principle of territorial sovereignty.²¹ On other occasions, they tend not to ignore transfrontier pollution since it goes beyond the worst that a country would tolerate for itself.²²

19. CARROLL, *supra* note 3; W.R. WILLOUGHBY, *THE JOINT ORGANIZATIONS OF CANADA AND THE UNITED STATES* (1979).

20. HEENEY, *supra* note 10.

21. CARROLL, *supra* note 1.

22. See INTERNATIONAL JOINT COMMISSION, *POLLUTION OF THE LOWER GREAT LAKES* (1970) [hereinafter cited as INTERNATIONAL JOINT COMMISSION (1970)]; INTERNATIONAL JOINT COMMISSION, *GREAT LAKES DIVERSIONS AND CONSUMPTIVE USES* (1985) [hereinafter cited as INTERNATIONAL JOINT COMMISSION (1985)].

Both the United States and Canada have, of course, participated with other nations in attempting to redefine the law of nations to deal with boundary waters, the high seas, and the atmosphere. The outcome of such "internationalism" has often been in the direction of better-defined territoriality. A good example is the historic dependence of the first Geneva Convention on the Law of the Sea on the preceding United States' autonomous Truman Proclamation²³ gaining international recognition for its jurisdiction over contiguous submarine resources. Territoriality also describes Canada's unilateral declarations concerning its rights over Arctic waters²⁴ and its claims to territorial rights over Georges Bank.²⁵ United States' interests have not always been so clear to its government but it too has, in the various forums where international law regarding trans-frontier pollution, fishing rights, ocean-floor mining and so on have been debated and resolved, struggled for either territoriality or freedom of the seas. The first principle, in other words, is very much alive.

Compared to the two countries' association with these hard-fought, acquisitive, and prescriptive international declarations, those other international meetings in which they have participated that have led to endorsement of the second principle have had much less international impact. The famous nonofficial codification of the international law concerning international rivers, known as the Helsinki rules,²⁶ follows the Trail Smelter case in asserting that states do not have a right to pollute waters in their own country to the extent that serious injury would result in a downstream country. In 1971 the drafters of the U.N. Stockholm Declaration on the Human Environment²⁷ obtained agreement to a similar proposition, that upstream states should not permit the environment downstream to be damaged by upstream activities under their control. Such declarations were not new. Canada and the United States had already inserted a pious declaration of this kind concerning international transfrontier pollution in their 1909 Boundary Waters Treaty, to the effect that they agreed that neither boundary waters nor waters flowing across the boundary should be polluted on one side to the injury of health and property on the other.²⁸

23. Proclamation No. 2667, 3 C.F.R. 67 (1943-48), reprinted in 59 Stat. 884 (1945).

24. See CAN. REV. STAT. Ch. 2 (1st Supp. 1970).

25. See Can. Gaz., Extra MP.101 (Nov. 1, 1976).

26. See generally Bourne, *The Development of International Water Resources: The Drainage Basin Approach*, 47 CAN. BAR REV. 62-87 (1969); Bourne, *Mediation, Conciliation and Adjudication in the Settlement of International Drainage Basin Disputes*, 9 CAN. Y.B. INT'L. L. 114-58 (1971); Bourne, *Procedure in the Development of International Drainage Basins: The Duty to Consult and Negotiate*, 10 CAN. Y.B. INT'L. L. 212 (1972).

27. Report of the United Nations Conference on the Human Environment, 3, U.N. Doc. A/Conf. 48/14/REV. 1 (1973) (Stockholm, June 5-16, 1972).

28. INTERNATIONAL JOINT COMMISSION, INTERNATIONAL JOINT COMMISSION-RULES ON PROCEDURE AND TEXT OF TREATY (1980).

The international declarations on outer space and ocean dumping adopt the same general approach.²⁹

Thus the second principle undoubtedly survives, and note has been taken of it by a widening circle of states. But it has yet to displace the first, nationalistic, accepted principle as the starting point of international negotiations concerning such specific issues as the eutrophication of the Great Lakes or the killing of soils and waters by acid rain.

EQUAL RIGHT OF ACCESS AND TRANSFRONTIER COMPENSATION

A new principle, "equal right of access," has been urged as an approach to transfrontier pollution.³⁰ It is in some degree merely a way of recommending to countries that they make explicit and formal an undertaking to listen to, and to consider, claims that their actions and policies will harm individual citizens of another country. It is introduced here because it raises questions about liability and compensation that are carried over from private international law.

Formally, the principle of right of equal access has been proposed so that in each country there will be as much protection given by judicial and administrative procedures to individual and regional interests downstream as that given to interests within the upstream nation's territory. Such procedures not only permit or enjoin pollution but also govern settlement by agreements calling for compensation and/or partial abatement.³¹

The OECD secretariat amplified the procedures inherent in the equal access principle in 1977 in *Legal Aspects of Transfrontier Pollution*.³² "Foreign persons" would have rights to participate equally with local persons in hearings and enquiries concerning official decisions and, particularly, to have recourse to administrative and judicial appeal procedures to abate, prevent, or be compensated for transfrontier pollution. The principle is most fully embodied in the 1974 Nordic Treaty³³ in which nationals of any Scandinavian country can, under some circumstances, use their own or a foreign court or administrative procedures to protect themselves from transfrontier pollution.³⁴

But North Americans need not look to Europe for informal examples of equal access. While judicial access across the border is infrequent,

29. I. WALTER, *INTERNATIONAL ECONOMICS OF POLLUTION* (1976).

30. See generally ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, *supra* note 12.

31. *Id.*

32. *Id.*

33. Convention on the Protection of the Environment Between Denmark, Finland, Norway, and Sweden, Feb. 19, 1974, 13 I.L.M. 591, 592 (1974).

34. ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, *supra* note 12.

illustrations of more informal administrative and political proceedings emerge almost every week in the torrent of dealings between the two countries. At the most local level, groups and individuals confer with and complain to councils and administrative bodies just across the border about releases of flood water downstream; about smoke from forestry slash burning crossing the border; about the condition of the Love Canal; and about traffic on international bridges and ferries.³⁵ At the state and provincial level, governments are familiar with "foreign" delegations turning up from the other country to put in their oar on local decisions or to appear before formal hearings considering provincial or state measures that will also have a foreign-country impact.³⁶

Furthermore, the courts of many American states already have recognized rights of standing by persons from other states to participate in review or appeal of local policies or actions; they can sometimes be extended to admit foreigners. At the highest national level, there are more and more examples.³⁷ Most effectively and most informally, Canadian emissaries lobby the Congress and the White House to gain support for their environmental objectives. In addition the Canadian government participates in, or supports, Canadian groups pleading before U.S. tariff, energy, communication, transportation, and environmental tribunals, often with the aim of going directly for official approval for their position perhaps of gaining official barring of some U.S. project. While it cannot be said that U.S. citizens use Canadian procedures to the same extent, they do use them in a limited way.³⁸

If everyone had access to the same courts or could settle suits arising from acid rain damage privately, then there would be a mechanism that would help to bring about the best possible adjustment to the pollution problem.³⁹ Those who wished to emit pollution but could not inexpensively reduce their waste discharges could pay compensation instead, while those who did not wish to pay compensation could clean up their emissions. Victims would gain either compensation payments or a cleaned-up environment. The opportunity to compensate privately could make everyone better off, upstream and downstream. Unfortunately, individual opportunities to litigate or to settle privately are probably too costly to be exploited. Drops of acid rain and other forms of reciprocal pollution are not labelled so that the emitters and the victims can identify each

35. INTERNATIONAL JOINT COMMISSION (1985), *supra* note 22.

36. N. SWAINSON, CONFLICT OVER THE COLUMBIA (1979).

37. CARROLL, *supra* note 1.

38. *Id.*; NEW ENGLAND GOVERNORS' CONFERENCE, INC., BACKGROUND PAPERS ON ACID RAIN (1984).

39. The following remarks have some relevance to Canada "adhering" to the U.S. Clean Air Act, § 115, 42 U.S.C. § 7415 (1982); see generally CARROLL, *supra* note 1.

other. Even if parties could access each others' courts and other administrative procedures, nothing helpful would emerge.

The importance of the possible adoption of a principle of private access is that it creates a new dimension for comparison of the first two principles. If private international law were based on the principle of absolute territorial sovereignty, then the chief roles of courts and tribunals would be to adjudicate the amounts downstream parties ought to pay to set a "fair price" for upstream state's abatement of pollution. For example, Holland has paid France to reduce the dumping of phosphate wastes into the Rhine to the injury of Dutch nurserymen.⁴⁰

Alternatively, assume that under the second principle the law permitted upstream industry to emit only a "reasonable" amount of waste into the shared environment. Then the role of the courts and tribunals would be to hear claims about by how much the emitter should cut down its pollution or, instead, how much it should pay to those injured. A need to pay compensation brings home the difference between the two principles. It is natural for a country to favor that principle which serves it best. But as between Canada and the United States, the border is so extensive that neither can be sure when it will be "upstream" and when "downstream." In 1909 when considering water diversion under the draft Boundary Waters Treaty, each decided it would be, as often as not, the upstream country and so each decided to go along with the principle of upstream sovereignty.⁴¹ What would they decide today, on acid rain, if payments were an alternative to pollution abatement?

Their calculations would almost certainly go beyond the rights and liabilities of their individual citizens. There are pollution emitters and pollution victims on both sides of the border. If polluters had the rights, the courts could order that compensation for abating be paid to polluters on behalf of the present victims downstream in Ontario, Quebec, New York State, and New England, millions of city and country dwellers whose lakes, forests, and buildings have been damaged by acid rain. If, however, victims had rights to no more than a "reasonable" injury, payments to them would come not only from profits of those emitting fumes, but also from the jobs and incomes of coal and oil workers, and from the prices paid for final products by millions of consumers. Either way, if the payers were to be helped by grants from their own governments, then millions of taxpayers would also become involved. Indeed, in both countries, the same persons might be involved as residents of upstream and downstream regions, and as taxpayers as well.

One would expect that the governments would force the taxpayers to

40. Kiss, *The Protection of the Rhine Against Pollution*, 25 NAT. RES. J. 613, 632 (1985); see generally d'Arge & Kneese, *supra* note 8.

41. HEENEY, *supra* note 10.

assist the polluters to clean up. If not, the implication is that the governments will force either the polluter and the polluter's workers, suppliers, and customers, to pay compensation and clean-up costs, or the victims individually to pay some clean-up costs. These would be drastic solutions. Pollution is said to be intolerable, but pollution abatement hardly increases anyone's cash capacity to cover the abatement costs. All it will do is, at great real economic cost in labor and capital, restore our lakes and forests to something like their condition twenty or thirty years ago. So vast are the restoration costs that it seems obvious that either polluters or victims can pay for them only very slowly or not at all. In short, tax-financed assistance must and will be called for both in Canada and the United States. If so, if the citizen taxpayer is to help cover the costs of abatement and adjustment, one should also think of net payments *across* the border, as might be called for between individuals under the principle of access. This was agreed to in advance in the Trail Smelter case.⁴² Of course, the direction in which the payment would flow is not certain, for that depends on whether the principle of territoriality or that of external responsibility is adopted.

Before embarking on an agreed program of acid rain cleanup, Canada and the United States should agree in advance, at the highest level, whether the burden of clean-up should be allocated on the principle of absolute territorial sovereignty, or on the principle that each country may not impose damage on its neighbours beyond some limit of reason or seriousness. To give sharpness and point to this decision each should contemplate that, depending on the costs of abatement, the amount of damage, the direction of the flow of pollutants, and the principle that has been selected, it may be forced to make a net payment to the other country.

THE INTERNATIONAL JOINT COMMISSION AS LAWGIVER

Can the IJC play a useful role in identifying or distilling principles applicable to a joint program against acid rain? One way to examine this question is to list the steps, or functions, necessary to almost any anti-pollution program and then to ask what the IJC can do about each of them.

The first step in most pollution proceedings has been taking notice of damage.⁴³ This was certainly true of acid rain; both in Scandinavia and in North America the issue was touched off by reports that fish had

42. See Trail Smelter Case, (U. S. v. Can. 3 R. Int'l Arb. Awards 1905, 1965 (1938 & 1941); Rubin, *supra* note 14.

43. Cumberland, *Role of Uniform Standards in International Environmental Management*, in ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, PROBLEMS OF ENVIRONMENTAL ECONOMICS (1972).

disappeared from some lakes and rivers.⁴⁴ A scientific literature on acid rain has now appeared. The second step is to link such damage to air or water *pollution*. This is nowadays easy enough in a general way, but more difficult to put into numbers. Some lakes and forests exposed to pollution seem not to have been injured.⁴⁵ Even the mere amount of current changes in air pollution loadings is not easily ascertained. The third step is to come to a conclusion about the *source* of such pollution. In the old days of international concern about local sewage in the water or smoke in the air, this third step was quite simple. One had only to follow one's nose. But with water pollution by rare and toxic metals and with air pollution by invisible gases, both of them transported far from their emitting sources, this step is scientifically the hardest.⁴⁶

The fourth step is to decide on an international policy strategy or program. For example, should the countries come to agreement on control measures at the source, or should they simply agree to an ambient standard (loading) in the general neighborhood of the presumed source? Should they agree to reduce the flow of the pollutant (loading) across the border, or to meet an ambient standard in the neighborhood of the place that is damaged? Should they agree instead on control measures at the destination or, finally, take steps to compensate those who live in the damaged region as a substitute for reducing its exposure to polluted air or water?

The IJC has served the two governments on all four steps. It has been much more successful with the first three than with the fourth. Its international boards of experts, scientists, or technical advisers have provided it with widely-accepted non-partisan information about damage, cause, and source of pollution from coast to coast, and have alerted it to new water and air pollutants, their effects, and probable causes. The IJC has considered this information and advised governments accordingly.

On the fourth step, strategy, the IJC has been greatly constrained. When it has offered advice, it has been confined within explicit and implicit terms of reference from the two parent countries.⁴⁷ The obvious reason for this is that the good relations between the two countries cannot be stretched to dilute each government's complete sovereignty over its own territory. Nor may the IJC suggest that either government avoid its

44. CARROLL, *supra* note 1.

45. P.H. PEARSE, F. BERTRAND & J.W. MACLAREN, *CURRENTS OF CHANGE* (1985).

46. The four steps mentioned in the text apply both to reciprocal and nonreciprocal pollution. Obviously, however, the procedures would differ. See Scott, *supra* note 9; Scott, *Economic Aspects of Transnational Pollution*, in ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, *PROBLEMS IN TRANSFRONTIER POLLUTION* (1974). For an alternative approach, see D. Munton, *Politics, Externalities and Environmental Dependence* (1982) (paper prepared for Conference on the Politics and Economics of International Stability and Cooperation, University of Minnesota, October, 1982).

47. See INTERNATIONAL JOINT COMMISSION (1985), *supra* note 22.

complete responsibility to its own citizens. Hence, the commission cannot "reach" far into national territory to recommend, for example, action against specific sources such as municipalities, or firms on either side of the boundary. The formal identification of such sources, the prescribing of a policy against them, and subsequent monitoring and enforcement are seen as national, not international, matters. There is no point in the IJC recommending that either government, or the IJC itself, participate in policies that would affect the liberties or actions of persons or places in either government's territory. It is not a supernational agency. Consequently, it has been confined to recommending "objectives," physical measures of the concentration of pollutants.

In short, the strength of the IJC has been in describing and monitoring. It developed its reporting strength in its earlier days when, performing other duties concerning levels and flows of boundary waters, it gained great prestige as an international regulatory agency, something like a public utilities commission. It also established an unusual capacity to get information processed by experts who were glad to work for it. In those days too, with that regulatory function, it even developed some little strength as an enforcement agency. It appointed binational control boards to report whether individual applicants for water-use rights had conformed to the rules and conditions it had set for them. Experience with these control boards later enabled the IJC to give some help with verifications, and even with enforcement, of the two countries' final agreements on the pollution of various river systems along the common frontier.⁴⁸

However, in doing these things the goodwill and the prestige of the IJC has been stretched very thin. The two countries have used a water-levels agency for purposes that were unheard of in 1909. They have required its boards to make reports on questions that tore its experts' loyalty in two directions.⁴⁹ They have asked it to front for them in disputes with their states and provinces.⁵⁰ They have even required it to criticize one of its parent governments.⁵¹

To expect it to continue on this overly ambitious course will be to weaken its acceptability for its other unfinished tasks. Certainly it can play some helpful role in whatever is to be done about acid rain. But the role must be limited to whatever it can accomplish acceptably to all parties: governments, states, provinces, pressure groups, and local elected representatives.

48. HEENEY, *supra* note 10: see INTERNATIONAL JOINT COMMISSION, OBJECTIVES FOR THE CONNECTING CHANNELS (1950).

49. See INTERNATIONAL JOINT COMMISSION (1970) and (1985). *supra* note 22.

50. *Id.*

51. *Id.*

To be more specific, the IJC should not be exposed to the conflict and pressure that emerge when commissioners are asked to favor one country's active policies, and the political partisans of that policy, against the other country. It can publicize new ideas and new approaches, and pioneer new standards. But there are functions it cannot perform. For example, it cannot in planning go against the policies of either of its parent governments as some of its members believed was required of it during the grim years preceding the Columbia River power agreement. Nor should it have to base recommendations on future administrative, monitoring, and scientific organization on suggestions from experts whose own careers will be dependent on what is recommended. It follows that it cannot begin to recommend the necessary steps to reduce damage from acid rain until its parent governments have established robust equitable principles concerning their rights and responsibilities.

It may be objected that one cannot expect governments to bind themselves in advance to acceptance of the workings of some general principle when they do not know to what expenses or political problems its application may lead them. The answer to this objection is that in international affairs governments do sometimes so bind themselves. Canada and the United States did so, for example, when they abandoned their rights to unlimited fishing for sockeye salmon in territorial waters and substituted a right to not more than 50 percent of each year's salmon run.⁵² They did so when they accepted in advance some rules of thumb about how power benefits and construction costs were to be shared under the Columbia and the St. Lawrence rivers power projects.⁵³ In fact, countries do so all the time, whenever they sign a treaty that commits them to some friendly behaviour over a future period.

If Canada and the United States are not willing to limit themselves to acting within prior principles, this then urgently suggests they should not depend on the IJC to plan an acid rain program for them. It is a useful organization for their environmental diplomacy and planning now,⁵⁴ but it would be wrecked if asked to put forward, without prior guidance on principles, an abatement campaign that might be criticized by one or both of the governments or assailed by citizen groups.

Without the IJC the two countries must proceed diplomatically, somewhat as they did before each of the great environmental/fisheries/boundary waters treaties between them. They have already taken the first few steps.

52. CORBETT, *supra* note 10; see generally SCOTT, *Fisheries, Pollution and Canadian-American Transnational Relations*, 28 INDUSTRIAL ORGANIZATION (1974).

53. J. KRUTILLA, *supra* note 9; N. SWAINSON, *supra* note 36.

54. See, e.g., INTERNATIONAL JOINT COMMISSION, REPORT ON THE POLLUTION OF BOUNDARY WATERS (1951); N. SWAINSON, *supra* note 36.

A joint acid rain study group reported in 1979.⁵⁵ Following it, a memorandum of intent was signed in 1980, accepting some of the findings of the study group, and undertaking to appoint five bilateral working groups to chart the next steps to be taken.⁵⁶

The memorandum called for functions to be performed reminiscent of the four steps already listed, three of them routinely performed by the IJC. Each function was to be assigned to a separate working group: (1) effects (injury) from pollution; (2) pollution concentrations (loadings) and chemical transportations from transported gases to acid precipitation; (3) linking loadings to sources (synthesis); (4) control measures and their costs at the source. The last group, (5) was to concentrate on institutions and legal issues, including liability and compensation. Obviously it was intended to work particularly closely with a supreme diplomatic coordinating committee. This structure would develop coordinated programs, and facilitate an early Canadian-American bilateral agreement concerning them.

By 1984 little of this had happened; President Reagan's administration has given the acid rain problem as a whole, and the Canadian aspect of it in particular, a low priority on its political agenda.⁵⁷ But the memorandum's assignments to the various working groups made sense, and one can hope that when acid rain is returned to the list of active negotiations between the two countries, something like the above study structure will be used.

That the path of such a secretariat will run into serious nationalistic and ideological roadblocks is evident from the fact that the groups were asked to design alternative *strategies*, or scenarios, to consider their *costs* and, at another stage, to consider the associated *legal liability and compensation*.⁵⁸ How are these programs, benefits, costs, and liabilities to be reconciled? Probably the hope of those who drew up this committee structure was that the experts, knowing the benefits and costs underlying the alternative strategies, would somehow themselves allot rights and sacrifices to citizens on both sides of the border, distilling some principle as they worked.

This hope is born of desperation; it can only lead to strife and frustration. Each expert, after all, will be a loyal servant of one of the two

55. A.P. ALTSHULLER & G.A. MCBEAN, FIRST REPORT OF THE UNITED STATES-CANADA RESEARCH CONSULTATION GROUP ON THE LONG-RANGE TRANSPORT OF AIR POLLUTANTS (1979).

56. See POLITICAL AND LEGAL ASPECTS OF A CANADA-UNITED STATES AIR QUALITY ACCORD (S. Eros & D. Munton eds. 1981); THE NEW ENGLAND GOVERNORS' CONFERENCE INC., *supra* note 38.

57. See Canadian Embassy, Public Affairs Division, Canada Responds to United States Inaction on Acid Rain (1984) (press release).

58. See Environment Canada, Memorandum of Intent Between the Government of Canada and the Government of the United States of America Concerning Transboundary Air Pollution (1980).

governments. He or she will not have a neutral, masterful, IJC to whom to report. The experts will not have prior principles to guide them in selecting projects or decisions concerning who must control or be controlled, pay or be paid. Because in this way the experts would be attempting to determine legal liability and technical strategy at the same time, one can foresee a long, wearisome schedule of meetings, reports, and rejections, along the lines with which the recent Law of the Sea conference has made us familiar.⁵⁹ It is important to note that the course of action under the Memorandum of Intent has not prevented political action on both sides of the border. Canada has been very active with the "30 percent Club"⁶⁰ in firming up a 1971 convention on long-range transport of air pollutants to deal with sulphur and, in 1984, nitrous wastes. Much of this activity has involved agreement with Ontario and the other provinces.⁶¹ On the U.S. side, many bills have been submitted to the Congress, most centering on the notion that U.S. emissions should be reduced by 10 percent, or about 25 million tons, from the 1980 levels.⁶² For example, the Rinaldo Bill would reduce SO₂ by 10 million tons and NO_x by 4 million tons. This would be accomplished by cost sharing with funds to be generated by a tax of 1/2 mills/kwh plus a special bond issue.

Would it not be better to work, politically, on principle first? Once this has been done, experts become comparatively bipartisan since they no longer have to defend their countries' interests. Indeed, with principles settled, the IJC itself could easily handle much or all of the planning and monitoring of an acid rain program.

NEGOTIATION ON POLLUTION CERTIFICATES AS A SOURCE OF PRINCIPLES

The concept of negotiation on pollution certificates raises the possibility of a new international institution that could meet some of the problems of Canada-U.S. agreement on principle while at the same time using and preserving the strengths of the IJC. First explored in a joint survey with Christopher Bo Bramsen,⁶³ it has since been revived several times.⁶⁴ The brief exposition below closely follows the original OECD formulation.

In any negotiation concerning transfrontier pollution, the states must deal with a standard list of elements: the source, flow, loading and damage from pollution; and a standard list of abatement measures, including their

59. M. ZACHER, CANADIAN FOREIGN POLICY AND THE LAW OF THE SEA (1977).

60. See NEW ENGLAND GOVERNORS' CONFERENCE, *supra* note 38.

61. See ENVIRONMENT CANADA, ACID RAIN: THE CANADIAN PERSPECTIVE (1984).

62. See, e.g., Acid Rain Control Act of 1985, H.R. 2918, 99th Cong., 1st Sess. (1985) (the Rinaldo bill, to amend the Clean Air Act).

63. See ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, PROBLEMS IN TRANSFRONTIER POLLUTION (1974).

64. See, e.g., Scott, *supra* note 9.

costs, construction times, operation, subsequent alteration, and cost sharing. The beauty of the certificates scheme is in its information requirements. Its implementation would automatically lead the two parties or their appointed agency to allocate research resources to the right questions. Furthermore, the setting-up and initial distribution of the certificates does not so much require previously agreed general principles as provide a constrained context for their distillation for the international pollution problem. Finally, the scheme also offers efficiency results sought by welfare economists. It is compatible with the emergence of a competitive market for marketable pollution certificates that can be predicted to lead to an efficient or lowest-cost means of acid rain abatement while either keeping the individual distribution of income and wealth unchanged, or altering it to a pattern deliberately chosen by the two nations.

Here are the rough outlines of the scheme. The countries' negotiators, with their experts and researchers, would meet to organize bilateral international machinery to issue "certificates" carrying on their face an entitlement to emit a unit amount of pollutant per year. These would be distributed to polluters or governments within each country to permit, in the initial year, whatever the current amount each is emitting. One task for the negotiators would be to decide which emitters and regions were in the international pollution airshed and so in the scheme. Probably the decision would be reached to set up zones, with emitters in the regions contributing least to transfrontier loadings receiving appropriately smaller certificate entitlements. In this way each nation would be charged with responsibility for ensuring that all discharges were discovered, for issuing each discharger certificates proportional to its contribution to transfrontier loadings, and for preventing the entry of new uncertificated emissions.

Although certificates would be issued for specific initial amounts of pollution that may be discharged by each establishment, the amount permitted by a certificate would decline according to a formula to be negotiated. The formula would typically represent a path of maximum discharge from the amount in the initial year to a target amount in a later year. For example, a decline of 6 percent per year for fifteen years, or a decline of four tons per year until zero is reached. The decline rates would be the principal means of cleaning up pollution. They would force a certificate holder either to abate his discharges or to buy extra certificates from another holder, who would be forced to turn to discharge-free processes. The latter feature is described below. Settling on the rates of decline would be a second principal function of the negotiators.

Certificates would be issued to dischargers of, and for, each type of pollutant. Certificates could be bought and sold at any time, but must be available for sale once a year. Consequently, certificates for different types of pollution and different locations of discharges could be exchanged

at market prices. This feature would be expected to lead to the highest-cost abatement processes being installed last, as the decline process continued. Enforcement of pollution reduction would be simplified by the certificate requirement, in that certificate holders would carefully watch one another, looking for evasion.

Victims of pollution damage would be served in two ways: first, in the negotiated stated rate of decline of permitted discharge, and second, in an additional right to enter the market and buy pollution certificates, thus accelerating the decline in the total amount of pollution permitted. Such revisions in the schedule would cost the victim state whatever the going price in the polluting state.

Another means of empowering intervention by the downstream state might be to allow it to issue or sell new pollution rights. In this way it could sell the right to postpone abatement, if polluters were willing to pay enough. This sale of new certificates can be considered as a means of compensation. On the other hand, the purchases of certificates by downstream victim states would provide money to polluters, and would thus be a means of cost-sharing. Describing and constraining the rights of the downstream government and its citizens to participate in the upstream market for certificates would be a third major task for the initial negotiators.

This scheme paraphrased above was essentially a proposal to assign rights for disposal of wastes in a lake or stream. How would one expect an air pollution scheme to perform? Information is scarce, for there are very few in operation. Indeed most studies of pollution rights have been made to support proposed, rather than actual, schemes. Until recently the most thorough were those of R.G. Noll and his associates at the California Institute of Technology⁶⁵ in connection with proposals to progress beyond the transferable rights, or "bubble," aspects of the present U.S. Clean Air Act.⁶⁶ Martin David and associates⁶⁷ have considered transferable water pollution permits.⁶⁸ A very recent study by Scott E. Atkinson deals with the Ohio Valley.⁶⁹ Important earlier work exists,

65. Hahn & Noll, *Designing a Market for Tradeable Emissions Permits*, in REFORM OF ENVIRONMENTAL REGULATION 119 (W.A. Magat ed. 1982); Hahn, *Market Powers and Transferable Property Rights*, 49 Q.J. ECON. 4 (1984).

66. 42 U.S.C. §7401 *et. seq.* (Supp. I 1977).

67. O'Neil, David, Moore & Joeres, *Transferable Discharge Permits and Economic Efficiency: The Fox River*, 10 J. ENV'TL. ECON. & MGMT. 4 (1983).

68. *Id.*

69. Atkinson, *Marketable Pollution Permits and Acid Rain Externalities*, 16 CAN. J. ECON. 4 (1983); Tietenberg, *Transferable Discharge Permits and the Control of Stationary Source Air Pollution: A Survey and Synthesis*, 56 LAND ECON. 391-416 (1980); Seskin, Anderson, Jr., & Reid, *An Empirical Analysis of Economic Strategies for Controlling Air Pollution*, 10 J. ENV'TL. ECON. & MGMT. 2 (1983); Krupnick, Oates & Van De Verg, *On Marketable Air Pollution Permits: The Case for a System of Pollution Offsets*, 10 J. ENV'TL. ECON. & MGMT. 3 (1983); and McGartland & Oates, *Marketable Permits for the Prevention of Environmental Deterioration*, 12 J. ENV'TL. ECON. & MGMT. 3 (1985).

however, especially work on disposal in connection with river and lake pollution.⁷⁰

For economists these air and water pollution rights schemes have a family resemblance to proposals to introduce individual rights to fish, divert water, pump groundwater, extract oil, graze animals on land, and occupy urban air space. A few of these do exist; all of them have tended to deepen a useful literature.

From this literature one can put together a composite list of problems and disadvantages of property rights in environmental resources. As might be expected, the majority of them are problems mainly for economists. They reflect the impossibility of ensuring, without excessive transactions costs, that a new type of certificate once created will be held and transferred freely. Instead, writers predict that the government will limit right transferability and, worse, fail to convey certainty that the number of rights issued will not be increased under political pressure.⁷¹ Also, they fear that whatever market emerges will be uncompetitive, or will tend to assist the concentration of rights' holdings into fewer hands than in an open-access world. They point out that the rights scheme must be closely monitored to assure that holders do not exceed their entitlements. And they emphasize that marketable rights, like pollution charges and fish royalties, cannot easily be denominated to deal with territorial or spatial problems such as arise when a distant holder of a right proposes to sell his entitlement to a buyer located much closer to the place where damage or loss can be caused by his behaviour.

Most of these problems of allocation of activity over space, cost minimization, equal opportunity, and so on, are to a greater or lesser extent problems for any other scheme. For domestic problems, rights schemes appear on balance superior to charges and to pure regulation; however, more space cannot be devoted to them here. Instead, admitting that the scheme can be easily criticized for its imperfections, a return to aspects of its suitability as an instrument for international action follows.

Therefore, the advantages of a rights scheme are cited here. First, it directs preliminary researchers to seek for the correct information. For example, the geographical scope of the pollution problem is also an urgent problem for a certificate scheme. Until it is determined, a polluter who buys a certificate from a firm that had not itself been a source of international acid rain might now add to the international problem. The sheer mechanics of setting up the scheme require that researchers establish those zones within which certificates can be freely transferred, and those

70. E.g., W. BAUMOL & W. OATES, *THE THEORY OF ENVIRONMENTAL POLICY* (1975); J. H. DALES, *POLLUTION, PROPERTY AND PRICES* (1968); Montgomery, *Markets in Licenses and Efficient Pollution Control Programs*, 5 J. ECON. THEORY 3 (1972); Rose-Ackerman, *Market Models for Water Pollution Control: Their Strengths and Weaknesses*, 25 PUB. POL'Y (1977).

71. See generally J. FAY & D. GOLOMB, *CONTROLLING ACID RAIN: POLICY ISSUES* (1983).

between which they can be transferred only at an emission "discount."

As observed regarding international environmental negotiation in the past, this is a tremendous advantage. The present acid rain "research" efforts, within and outside the international memorandum of intention, are part of an unbounded, endless, research domain. Almost any inquiry in meteorology, engineering, chemistry, biology, geology, hydrology, economics, and political science can be justified as "relevant." Consideration and adoption of the certificate scheme, however, would at once indicate those avenues of research that are indispensable, and those which can be postponed or neglected. The breadth of research connected with each of the three steps becomes clear: which damage is to be considered in issuing certificates, is it caused by pollution, and what are the sources of the pollution for which certificates must be held? The negative aspects of these questions are just as important: which emission sources are not sources of international pollution and should not receive certificates, which pollution situations cannot be linked to damage, and which damage is not "serious?" While the breadth of these remaining questions cannot be minimized, the scheme has a real advantage over others in almost automatically indicating research priorities.

A second advantage of a certificate scheme is that, from the beginning, it narrows the generality of irritating questions of principle by directing negotiations to the operations of an international certificate scheme. The scheme has in its simplest forms an implication that the polluter must pay. However, its gradual decline in each certificate's entitlement would, as with the second principle, imply that the upstream party has not unlimited territorial rights. But the extent of this implication is itself subject to bargaining. The rate of decline can be fine-tuned by zone, for example. Many other modifications to the simplest scheme will occur to those around the bargaining table. The point is that the scheme gives the two countries an understandable structure which their experts and diplomats can extend and refine.

Their refinements are not constrained to make the actual instruments of emission control administered in the various states and provinces uniform or even that, at the plant or firm level, it be a "rights" scheme at all. Each nation will receive a given number of certificates. These it will probably distribute to regional agencies to allot to the original holders. Each state or province can administer the agreed decline, as between its individual emitters, as it chooses. The scheme only requires that all certificates be available for sale once a year, by emitters or by the local agencies regulating them. Thus the scheme can provide a framework for a desired international result while leaving room for domestic policy

variation, and leaving domestic administrative agencies responsible for the incidence of local pollution abatement.

A third advantage is that the scheme can permit each country to bring about an increased application of the first principle. With or without negotiated restriction, the downstream country can help finance its own release from acid rain by purchasing separate certificates in the upstream certificate market. The more it buys, the more rapidly the sources of pollution are induced to reduce their emissions by compensated abatement. Thus some international sale, rental, or transferability of certificates would allow the downstream country to recognize the territorial rights of the upstream country to make its own decisions, to be sovereign. Yet it would allow the downstream country to flexibly participate in hastening its relief from acid rain. For negotiations to discuss this procedure would probably be easier and less precedent-setting than discussing principles in the abstract.

Thus the design of this acid rain scheme requires a decision on both the rate of decline of each certificate's permitted emissions, and on the extent to which each country may, or must, participate in the purchase of rights valid in the other country. In this way it permits prior agreement on the combined principles of how much territoriality and how much responsibility to neighbors in a context in which the principles are not textbook ethical principles but have predictable consequences. Agreement between the two nations implies that the sharing of environmental benefits and of abatement costs, and also the amount of "compensation" in the form of across-border certificate purchases, are all understood.

The scheme would use the IJC without straining it or destroying its usefulness for other international problems. For example, one important role for the IJC would be to verify that states, provinces, or individual certificate holders were policed by their governments so as not to exceed their emission rights. Another function would be to utilize its experience and existing organization to see to the orderly reduction of the stock of certificates outstanding every year. In addition, it would also have a responsibility to set up an expert watchdog body to make sure that an active certificate market existed. Failure in this respect would not be fatal to the simplest variant of the scheme. But it would harm the cost-reducing features of any transferable certificate system, and make it unattractive for the downstream victims to make compensatory purchases of certificates in the upstream market.

While performing such function, the IJC would be able to allow the two governments to get the best of both worlds. They would obtain for their acid rain scheme the advantages, unknown elsewhere, of an existing

organization prepared to act independently and firmly on matters of fact and matters of performance. At the same time they would, by their negotiation of a treaty during which equitable principles are dealt with implicitly rather than explicitly and abstractly, preserve the IJC for future problems beyond acid rain.