Acid Rain: Multilateral and Bilateral Approaches to Transboundary Pollution Under International Law

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This article seeks to examine the difficult problem of acid rain in an international law context. It begins by discussing the environmental difficulties that may be created by acid rain. Within this context, the authors then discuss the development of customary international law relevant to the question of acid rain. Following this, the authors move to a more specific discussion of multilateral and bilateral arrangements dealing with transboundary pollution with special emphasis on American-Canadian relations. Finally, the authors conclude by assessing the difficulties associated with the development of legal standards in this area.

Cette étude cherchera à examiner l'énorme problème des précipitations acides à l'intérieur d'un contexte de droit international. L'auteur premièrement discutera des difficultés environnementales que crée les précipitations acides, et puis, il notera le développement coutumier du droit international qui se fit autour du problème de précipitations acides. Par après, on apercevra l'étude prendre une note plus spécifique détaillant les arrangements bilatéraux et multilatéraux de la pollution transfrontière, avec une emphase spéciale sur les relations américo-canadiennes. En dernier, l'auteur évaluera les problèmes associés au développement des standards légaux dans cette region.

1. Introduction

Transboundary pollution problems are not uncommon in the history of American-Canadian relations. However, no single transfrontier environmental issue has had the public profile (especially in Canada), or has presented such seemingly intractable difficulties in resolution, as acidic precipitation, more commonly referred to as acid rain. Nor has the problem been restricted to North America. Concern over the long-range transport of air pollutants in Europe and particularly in Scandinavia dates at least from the 1960s. In Canada and the United States the issue did not ripen as a visible public issue until the late 1970s. Not surprisingly, the North American research effort on acid rain has similarly lagged behind that of the Scandinavian countries.

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Despite the relatively recent vintage of the issue in North America, at least as a matter of serious concern, there is a voluminous and rapidly growing literature, scientific and otherwise, on the subject.[1] For a lawyer especially, acid rain offers a large number of interesting issues, both domestically (under constitutional law, administrative law and torts) and internationally (both bilaterally and multilaterally, and under both public and private international law). Indeed, even a summary of the various legal implications of the problem would constitute a substantial research effort.

Our purpose here however, is more modest. Specifically, we are interested in the evolution of multilateral and bilateral mechanisms to deal with the problem of acid rain, and in how Canada has contributed to this evolution. This involves not only a consideration of the mechanisms themselves but also an examination of the legal context in which they have developed, and more particularly of some principles of international law that have emerged with respect to transfrontier pollution generally. We should note further that, as our focus here is primarily on public international law, we do not deal with the important question of the respective powers of federal and provincial governments, or with the various transborder initiatives taken by the provinces with respect to acid rain.

Our discussion begins with a brief statement of the environmental problems posed by acidic precipitation in eastern North America. This is followed by an account of the development of rules of customary international law pertaining to transfrontier pollution. We draw heavily upon state practice in international river basin law, where the principles have received their most sophisticated exposition to date. It will be clear that this experience has been relied upon in the development of mechanisms established to address the problem of transfrontier air pollution.

The paper then analyses both multilateral and bilateral arrangements that have been developed in this area. With respect to the former, the discussion continues with a detailed exposition of the Convention on Long-Range Transboundry Air Pollution concluded under the auspices of the Economic Commission for Europe. This is the only major multilateral instrument to have specifically addressed the issue of transfrontier air pollution. It is of special significance in the North American context in that it has been signed and ratified by both the United States and Canada.

The discussion continues with a review of the development of bilateral mechanisms by the United States and Canada with respect to both the problem of transborder pollution generally and the more specific concern of acid rain. Special emphasis is placed upon the techniques that have been relied upon with respect to water pollution, and particularly upon the

[1] A number of good overviews for the layperson exist. See especially G.S. Wetstone and A. Rosencranz, *Acid Rain in Europe and North America: National Responses to an International Problem*, Washington, D.C., 1983. For overviews with a somewhat more restricted focus see J.E. Carroll, *Acid Rain: An Issue in Canadian-American Relations*, Washington, 1982; and D.M. Johnston and P. Finkle, *Acid Precipitation in North America: The Case for Transboundary Cooperation*, Calgary, 1982.

approach to dispute resolution and avoidance that has been exemplified by the International Joint Commission. This approach will be compared with that taken towards the problem of acid rain under the Memorandum of Intent between the two states.

By way of conclusion we review the difficulty of developing and applying legal standards to deal with transboundary pollution generally, and acid rain specifically. In this context, we note the convergence of multilateral and bilateral processes. Finally, we offer some comments on Canada's use of these various techniques and its success in advancing international law in the area.

1.1 Acid Rain: The Problem

Acid rain is closely related to the wider problem of long-range transport of air pollutants. It is generally agreed that certain air pollutants are dispersed through long-range atmospheric transport. Of particular concern are sulphur oxides (SOx, but especially sulphur dioxides SO2) and nitrogen oxides (NOx) which are subject to chemical transformation either in the atmosphere or upon deposition in dry form. Although strictly speaking acid rain refers only to deposition of the acids through precipitation (i.e., "wet" deposition), we will refer to the problem generally as one of acid rain.

Even "normal" rain will be somewhat acidic, with a typical pH in eastern North America of 5.6[2]. However, as the pH level drops (i.e., as acidity rises) concern over environmental effects grows, especially with respect to the impacts on aquatic ecosystems. In some parts of southern Ontario, rain with a pH level of 4.5 to 4.0 (the latter forty times the level of "normal" rain) is not uncommon.[3]

While the exact effects of acid rain on the environment are not yet fully understood, existing research does point to some serious possible problems. Of greatest concern is the effect of acidification on aquatic ecosystems. A wide range of studies in both North America and Scandinavia has suggested a correlation between changes in pH levels of water and

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[2]United States-Canada Research Consultation Group on the Long-Range Transport of Air Pollutants, *The LRTAP problem in North America: a preliminary overview*, 1979, at 1. (hereafter referred to as the LRTAP Report). Much of the following discussion draws on the synthesis of research offered by that report. A solution's alkalinity or acidity is described by its pH level. Briefly, pH may be described as:

> a logarithmic measure of the hydrogen ion concentration on a scale ranging from 0 to 14. On the pH scale, a chemically neutral solution has a value of 7, which is midway on the scale. The greater the acidity, the lower the pH value. A change of one pH unit downward implies a tenfold change in the hydrogen ion concentration, or a tenfold increase in acidity; a change of two is a hundredfold. If for example, a pH is 4, it is 10 times more acidic than a pH of 5; a pH is a hundredfold more acidic than a pH of 5.

Ontario, Ministry of the Environment, *The Case Against the Rain: A Report on Acidic Precipitation and Ontario Programs for Remedial Action*, October 1980, at 3.

[3]*Id.*, *The Case Against the Rain*, at 3.

changes in aquatic life.[4] Although most of the public attention has focused on the impact on fish populations, dramatic effects have also been recorded on other links in the food chain, such as frogs, toads and salamanders, which breed in pools formed by melting snow and spring rain, pools which are more likely to exhibit low pH levels.[5] Although a range of 5.5 to 5.0 is commonly cited as a danger point for pH levels in susceptible[6] lakes, at least one experiment suggests that effects on food chains are felt at pH levels just under 6.0[7] (or *one tenth* the acidity level of a lake with a pH of 5.0).

While the direction of effects of acidification on aquatic life seems well-established, other environmental impacts of acid rain are less clear. Studies have been conducted on the effects of terrestrial ecosystems, with respect to vegetation, wildlife and soil. However, the evidence of direct and serious damage in this area is much less clear than that available for aquatic impacts.[8] Similarly, despite some public concern as to the potential effects of acid rain on humans, the data to date does not appear to support the proposition that acid rain by itself constitutes a serious threat to human health, either directly or indirectly.[9]

Acid rain has caused particular problems in eastern North America for a number of reasons, but perhaps most especially because of the specific meteorological conditions and the particular sensitivity of many water bodies in the region. The area is characterized by a pattern of prevailing westerly winds, but with some significant seasonal variations, most notably the frequent winter flows to the south and summer flows to the north in the Great Lakes area.[10]

Of special significance for transboundary air pollution are the effects of stagnating high pressure areas in summer and periods of persistent winds:

> Ample evidence has now been accumulated to show that extended episodes of regional-scale pollution occur over much of eastern North America. Particularly in the summer, the stagnation of a high pressure system can lead to the slow advection northward of Maritime Tropical air masses from the Gulf of Mexico. These moisture-laden air masses accumulate pollution (SO2, etc.) from the industrial sources located in the northern United States and along the United States-Canada border.

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[4]See United States-Canada, *Memorandum of Intent on Transboundary Air Pollution, Executive Summary*, Work Group 1, February 1983, at 1-4.

[5]*Id.*, at 1-5.

[6]As discussed *infra*.

[7]*Id.*, at 1-6.

[8]See generally, id., at 1-13 to 1-16.

[9]*Id.*, at 1-16 to 1-18.

[10]*LRTAP Report*, *supra*, note 2, at 9.

> In addition to the dry deposition of sulfate in the weak northward flow, there is ample opportunity for the removal of sulfates by precipitation. Convective air mass showers are typical in Maritime Tropical air masses. Also, as a stagnating anticyclone breaks down, frequently the leading edge of the advancing air mass is preceded by a frontal zone in which the occurrence of precipitation is favored. Both of these mechanisms favor the washout of sulfates and contribute to the acidic precipitation of the northeastern United States and the southeastern provinces of Canada.[11]

Of equal significance to the meteorological phenomena which enhance the possibility of transboundary flows is the sensitivity to harm of the area receiving air pollutants. Depending upon the ability of a particular ecosystem to buffer the effects of acidic deposition (for example because of the high alkalinity of bedrock or soil overburden in an area) one region may be able to successfully withstand levels of pollutants that would be disastrous in another region relatively lacking in buffering capabilities. Unfortunately, large portions of eastern North America, and especially the Canadian Shield, are considered particularly sensitive to acidification.[12]

The very complexity of various physical interactions that characterizes the phenomenon of acid precipitation makes the legal issues involved in dealing with the problem that much more difficult. Although significant impacts have been observed in areas receiving acid precipitation, the exact nature of the causal relationship is not perfectly clear. For example, what is the relative importance of natural processes in contributing to acidification? Moreover, information gaps still exist with respect to the meteorological processes by which air pollutants are transported. Such factors are of course crucial for traditional legal approaches to apportioning responsibility for damage. The question of how to react to a serious environmental problem in the face of scientific uncertainties has become a major sticking point in the acid rain debate, with the United States and Canada taking significantly different positions on the implications of the existing body of research.

2. Evolution of Transfrontier Air Pollution Law

Multilateral and bilateral techniques and agreements for coping with the problem of acid rain cannot be looked at in isolation. They must be considered in the broader context of the customary law of state responsibility and transfrontier pollution, which has influenced the development of both the ECE Convention on Long-Range Transboundary Air Pollution and the U.S.-Canada Memorandum of Intent.

International attempts to control and impose liability for transfrontier

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[11] *Id.* at 9 to 10.

[12] See id., at 22 to 24 for a discussion.

air pollution are of relatively recent origin.[13] Apart from isolated instances such as the *Trail Smelter*[14] case during the 1930s and 1940s, the more general concern with air pollution and acidic emissions is a phenomenon of the 1960s and 1970s. There has, therefore, been little time for the development of either customary international law or treaty law on the subject. Indeed, the ECE Convention on Long-Range Transboundary Air Pollution of 1979[15] is the first (and only) multilateral convention devoted to the problem of transboundary air pollution. In the absence of customary and treaty law specifically related to the problem, reliance must be placed on the wider body of law on state responsibility. In addition more specific assistance can be drawn from the legal principles applicable to international rivers, which represent an example of a "shared resource".[16] Historically, significant attention has been given to developing the international law applicable to watercourses, and state practice in the area is more extensive and better collated than for any other example of shared natural resources. Admittedly, navigation constituted an early concern in the regulation of the resource,[17] but it is still fair to say that the body of air pollution law lags behind the regime for pollution management which has been developed for international bodies of water and international drainage basins.

In recent years, and particularly in the early 1970s, important work was accomplished in the field of transfrontier pollution law by the Organization for Economic Cooperation and Development (OECD). The OECD is composed of industrialized nations, including Western Europe, USA, Canada, Japan, New Zealand, and Australia. It excludes the Eastern European States. The OECD's work focused on the economics of transfrontier

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[13]See generally: J. Schneider, *World Public Order of the Environment: Towards an International Ecological Law and Organization*, Toronto, 1979; B. Johnson, *International Environmental Law*, Stockholm, 1976; V.P. Nanda (ed) *World Climate Change: The Role of International Law and Institutions*, Boulder, 1983; Handl, "State Liability of Accidental Transnational Environmental Damage by Private Persons", (1980) 74 A.J.I.L. 525, Hoffman, "State Responsibility in International Law and Transboundary Pollution Injuries", (1976) 25 I.C.L.Q. 509; Organization for Economic Cooperation and Development, *Legal Aspects of Transfrontier Pollution*, Paris, 1977.

[14](1938/1941) 3 U.N.R.I.A.A. 1905.

[15]Geneva, December 13, 1979, reprinted in (1979) 18 Int'l Leg. Mat. 1441; the Nordic Convention on the Protection of the Environment Between Denmark, Finland, Norway and Sweden, Stockholm, 19 February, 1974 is wider in scope: reprinted in 13 Int'l Leg. Mat. 591.

[16]The concept of "shared resources" in international law is gaining acceptance following important work of the United Nations Environment Programme (UNEP) in developing its Draft Principles of Conduct in the Field of the Environment For the Guidance of States in the Conservative and Harmonious Utilization of Resources Shared by Two or More States, reprinted in (1978) 17 Int'l Leg. Mat. 1097. These principles do not define the term "shared resource" but the Executive Director of UNEP in a report prepared on the subject gave several examples including: "(a) an international water system, including both surface and ground waters; (b) An air-shed or air mass above the territories of a limited number of states": Report of the Executive Director on Co-operation in the Field of the Environment Concerning Natural Resources Shared by Two or More States, UNEP/GC/9-4, February 20, 1975 at 40 to 41. The status of the draft principles and the concept of shared resources was favourably reviewed by the International Law Commission in its draft articles on the law of the non-navigational uses of international watercourses, Y.B. of the Int'l L.C. 1980, Vol. II Part 2 A/CN.4/SER.A/1980/Add.1 (Part 2) at 120 to 136.

[17]B. Vitanyi, *The International Regime of River Navigation*, Sijthoff and Noordhoff, 1979.

pollution[18] and on the development of legal principles on equal right of access and non-discrimination in relation to transfrontier pollution, and the responsibility and liability of states. The OECD provided a forum in which receptor states for transfrontier pollution (such as Canada) could raise their concerns in a multilateral context.

In the late 1970s the focus shifted from the OECD to the United Nations Economic Commission for Europe (ECE). The ECE proved an advantageous forum for this particular problem because, unlike the OECD or the European Economic Community, it embraced both eastern and western European and trans-Atlantic states, while excluding Japan, Australia, and New Zealand. The ECE also provided a natural focus for continuing to develop statements made in the Final Act of the Conference on Security and Co-operation in Europe (the Helsinki Agreement) on environment and transfrontier pollution.[19] The Final Act specifically called upon the participating states to use the good offices and resolutions of the ECE to facilitate further cooperation in this area. This stimulus to ECE involvement eventually resulted in the ECE Convention on Long-Range Transboundary Air Pollution in 1979.[20]

In this section of the paper we shall attempt to establish the international legal context in which to consider the ECE Convention and the Memorandum of Intent Between Canada and the United States of America Concerning Transboundary Air Pollution. The statement of the legal principles will distinguish between substantive and procedural rules. It will draw upon traditional sources of international law as well as indicia of "soft" law, such as OECD resolutions and the Helsinki Agreement.

2.1 Substantive Law

The substantive law of transfrontier pollution has its origin in the general principles of state responsibility and particularly the rather vague 'neighbour principle'. The neighbour principle requires that a state should not permit its territory to be used to the detriment of another. The highest authority for this is the dicta of the International Court of Justice in the *Corfu Channel Case*.[21] There the Court considered the liability of Albania for damage done to British warships by mines laid within the territorial waters of Albania in the Corfu Channel. The Court held that Albania was obliged to notify the warships of the imminent danger to which they were

[18]See for example, OECD, *Problems in Transfrontier Pollution*, Paris, 1972, (Record of a Seminar on Economic and Legal Aspects of Transfrontier Pollution held at the OECD in August, 1972).

[19]Conference on Security and Co-operations in Europe: Final Act, Helsinki, August 1, 1975, reproduced in (1975) 14 Int'l Leg. Mat. 1292 esp. "Co-operation in the Field of Economics Science and Technology and the Environment." The Helsinki Final Act is not an internationally binding agreement. The final clauses of the Act specifically state that it is ineligible for registration under Article 102 of the Charter of the United Nations.

[20]Discussed in detail *infra*.

[21][1949] I.C.J. Reports 4, 22.

exposed because of, *inter alia*, "every state's obligation not to allow knowingly its territory to be used contrary to the rights of other states." Although this phrase was used by the Court in a relatively narrow context it has been urged by many writers that it is capable of much wider application,[22] and it is interesting to note that there is both a procedural (the duty to notify) and substantive context to the Court's judgement.

Support for the neighbour principle may also be derived from an *obiter dictum* in the *Lac Lanoux case*[23] and from the *Trail Smelter* Arbitration.[24] The *Trail Smelter* Arbitration is the only one of the three decisions directly concerned with the problem of transfrontier air pollution. However, as pointed out by some writers,[25] the tribunal's strong pronouncements on state responsibility for transfrontier pollution have to be read in the context of the terms of reference of the tribunal. First, the tribunal was required to apply "the law and practice followed in dealing with cognate questions in the United States of America, as well as international law practice." Second, Canada accepted liability and therefore the tribunal was primarily concerned with assessing damages. Nevertheless, the tribunal did make some exceptionally strong statements on state responsibility:[26]

> [N]o 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 a serious consequence and the injury is established by clear and convincing evidence.

The poor quality of these authorities has not prevented them from being widely cited by authors, and even adopted in the form of Principle 21 of the United Nations Conference on the Human Environment:[27]

> States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

This principle was echoed with approval in the Helsinki Final Act.[28] Although Principle 21 was not itself considered to be legally binding at the

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[22]See for example, Handl, "Territorial Sovereignty and the Problem of Transnational Pollution" (1975), 69 A.J.I.L. 50 at 55.

[23](1959), 24 I.L.R. 101 at 130.

[24](1938/41), 3 U.N.R.I.A.A. 1905.

[25]Handl, *supra*, note 22 at 60, 61; Rosencranz, "The International Law and Politics of Acid Rain", in V.P. Nanda (ed), *supra*, note 13, at 196, 197.

[26]3 U.N.R.I.A.A. 1905, at 1965.

[27]Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June, 1972, A/CONF. 48/14/Rev. 1; L.B. Sohn, "The Stockholm Declaration" (1973), 14 Harv. Int'l L.J. 423.

[28]*Supra*, note 19, "*Acknowledging* that each of the participating States, in accordance with the principles of international law, ought to ensure, in a spirit of co-operation, that activities carried on in its territory do not cause a degradation of the environment in another State or in areas lying beyond the limits of national jurisdiction."

time, Handl has argued that "the basic concept of responsibility embodied in Principle 21 is certainly founded on what today must be considered a well-settled state practice, at least in the field of water pollution."[29] However, even accepting this proposition, a number of limitations are inherent in any reliance on either Principle 21 or the dicta of *Trail Smelter*. For example, the *Trail Smelter* case refers to injury of a *serious* consequence, established by clear and convincing evidence. Hence, the mere fact of pollution is not sufficient; it must also cause injury, and a clear chain of causation must be established. Handl has also argued that liability is not strict but rather requires some proof of fault.[30] Neither *Trail Smelter* nor Principle 21 deals in detail with limitations which may be imposed on existing pollution sources. The inadequacy of international environmental law in this regard was itself recognized by Principle 22 of the Stockholm Conference which called upon states to "develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction." The limitations inherent in these cases are particularly apparent when their application to acid rain is considered. In most cases of long-range transboundary air pollution it will be difficult to establish both the source of the pollution and serious injury, especially when a number of sovereign states are involved, as in Europe.

With respect to some types of pollution, notably water pollution, it has been possible to progress beyond the broad statements of Principle 21 and the *Trail Smelter* decision. For example, the Helsinki Rules of the International Law Association[31] include three Articles on the subject of pollution of international drainage basins whch constitute a specific application of the principle of equitable utilization. Article X(1) of the Rules is critical:

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

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[29]Handl, *supra*, note 22, at 67.

[30]Handl, *supra*, note 13.

[31]Helsinki Rules of the Uses of the Waters of International Rivers, *Report of the Fifty-Second Conference of the International Law Association Held at Helsinki; August 14-20, 1966*, (1967) and see Bourne, "International Law and Pollution of International Rivers and Lakes" (1971), 6 U.B.C.L. Rev. 115. A stricter test is formulated by the Resolution of the 59th Session of the Institute of International Law, Athens, September 12, 1979, adopting the work of the Committee on the Pollution of International Rivers and Lakes. Article II of the Resolution specifies that "states shall be under a duty to ensure that their activities or those conducted within their jurisdiction or under their control cause no pollution in the waters of international rivers and lakes beyond their boundaries." Art. III follows this with a duty to abate existing pollution and prevent any new pollution or increase in pollution.

The Article distinguishes between existing and future pollution and merely attached to *substantial* injury or damage. A state is only obliged to have "reasonable" measures to abate *existing* pollution.[32] Thus, these rules have not been free from criticism despite some improvement on the general terminology of the cases.[33]

2.2 Procedural Law

Procedural obligations provide an important basis on which to exercise substantive rights and are therefore equally deserving of consideration. The procedural law of transfrontier pollution falls into two main categories. On the one hand, there are the procedural obligations which one state may owe to another, such as the duty to exchange information, to notify, to consult and to negotiate in good faith with a view to reaching an agreement. On the other hand, considerable attention has been given recently to developing a body of procedural rights available to the citizens and associations of another state, for example the right of equal access to courts or the duty of non-discrimination. The former finds relatively solid basis in both state practice and a series of bilateral and multilateral agreements, including the ECE Convention on Long-Range Transboundary Air Pollution, but the latter owes its development primarily to the work of the OECD.

2.2.1 The Duty to Notify[34]

There is general acceptance of the duty to give notice to another state of a contemplated activity within the jurisdiction which may have a substantial extra-territorial effect. This principle has been best developed for international river basins[35] but it finds strong support in the area of transfrontier pollution,[36] and in the context of shared resources generally.[37] The duty has been incorporated into numerous bilateral and multilateral agreements, which themselves may be seen as evidence of a practice generally accepted by states.[38]

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[32]Bourne, *id.*, at 125.

[33]The inadequacy of the Helsinki Rules for coping with water pollution has been treated elsewhere: see Teclaff "The Impact of Environmental Concern on the Development of International Law" (1973), 13 Nat. Res. J. 357.

[34]For a review of procedural rules in the context of international drainage basins, see: Bourne, "Procedure in the Development of International Drainage Basins" (1972), 22 U. of Toronto L.J. 172; and more generally, A. Lyon, *Protecting the Human Environment: Procedures and Principles for Preventing and Resolving International Controversies*, New York, UNITAR, 1977.

[35]Salzburg Resolution of the Institute of International Law on the Utilization of Non-Maritime International Waters, 3-12 September 1961, Article 5, reproduced in the *Report of the Panel of Experts on the Legal and Institutional Aspects of International Water Resources Development*, United Nations, New York, 1975 at 196.

[36]Athens Resolution of the Institute of International Law, *supra*, note 19, Article VII(1)(b) & (c).

[37]See UNEP Principles, *supra*, note 16.

[38]See the agreements cited in Bourne, *supra*, note 34 at 179 to 181.

2.2.2 The Duty to Exchange Information

The duty to notify another state of contemplated activities may not itself be particularly significant unless accompanied by a duty to provide and exchange further information about the contemplated project and its effects, as well as broader information on pollution problems and base-line environmental data. A generous interpretation of the value of information exchanges was adopted by the UNEP Draft Principles of Conduct for the Guidance of States in the Conservation and Harmonious Utilization of Natural Resources Shared by Two or More States:[39]

> States sharing a natural resource should, to the extent practicable, exchange information and engage in consultations on a regular basis on its environmental aspects.

In the area of water law the principle of information exchange seems so well accepted that current discussions focus on the specific types of data which should be collected, the compatibility of the data, and the costs of data collection and exchange.[40] Bourne has suggested that the procedural rules for international river basins may now be subsumed under the general principle of equitable utilization. He formulates the following propositions which are of interest here:[41]

> First, a state must give co-basin states prior notice of works or utilizations that might cause them serious injury.
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> Second, a state wishing to undertake a work or utilization that might cause serious injury to co-basin states must give them sufficient information about it so that they may appreciate the true nature of the proposed work or utilization.

Information and data exchanges in the context of air pollution have been a particular concern of the OECD. In November 1974 the Council of the OECD adopted a series of principles concerning transfrontier pollution (which represented the culmination of two and one half years' work on the subject by the Environment Directorate[42]) in the form of the Recommendation on Principles Concerning Transfrontier Pollution.[43] Titles

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[39]See *supra*, note 16, and see also Principle 7.

[40]See for example, the first report of the I.L.C.'s Special Rapporteur (Schwebel) on The Law of Non-Navigational Uses of International Watercourses, Y.B. of the Int'l Law Comm. 1979, Vol. II, Pt 1 (A/CN.4/SER.A/1979/Add.1 (Part 1) at 175 to 177. Schwebel recognizes that some types of data will always be useful. His draft Art. 8 provides that "A contracting State shall collect and record data with respect to precipitation and evaporation of water and with respect to the stage of flow, mean velocity and abstraction of the water of an international watercourse . . ." In addition it was recognized that further specific requests might be made which ought to be honoured where possible (Art. 9). Art. 10 deals with the costs of data collection and exchange.

[41]Bourne, *supra*, note 31 at 122.

[42]Stein, "The OECD Guiding Principles on Transfrontier Pollution" (1976), 6 Ga. J. Int'l Comp. L. 245, at 245.

[43]OECD Recommendation on Principles Concerning Transfrontier Pollution, November 14, 1974, reproduced in Ruster and Simma, *International Protection of the Environment*, Volume 1 at 316 New York (1975-) (hereafter Ruster). See also OECD Recommendation for Strengthening International Co-operation on Environmental Protection in Frontier Regions, 21 September, 1978, reproduced in (1978), Int'l Leg. Mat. 1530 and for comment, Dupuy and Smets "Co-operation in Frontier Regions" (1979), 5 Env'l Policy and Law 175.

E and G of the Annex attached to this Recommendation provide for the exchange of information about particular works or undertakings and more general scientific information and data on transfrontier pollution. Clauses 6 and 11, for example, provide as follows:

> 6. Prior to the initiation in a country of works or undertakings which might create a significant risk of transfrontier pollution, this country should provide early information to other countries which are or may be affected. It should provide these countries with relevant information and data, the transmission of which is not prohibited by legislative provisions or prescriptions or applicable international conventions, and should invite their comments.
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> 11. Countries concerned should exchange all relevant scientific information and data on transfrontier pollution, when not prohibited by legislative provisions or prescriptions or by applicable international conventions. They should develop and adopt pollution measurement methods providing results which are compatible.

The Recommendation also refers to the need for joint monitoring and research studies in the field of transfrontier pollution. Although OECD Recommendations are not binding on member states, they are the result of careful study and consideration by OECD's Environment Committee and are approved by the OECD Council. As such, they represent a consensus of member states on transfrontier environmental questions, and, as a particularly concrete form of state opinion, are likely to facilitate and influence the development of related norms of international law. They may also form the basis of binding multilateral agreements such as the ECE Convention on Long-Range Transboundary Air Pollution.

The duty to exchange information on problems associated with the environment, pollution, and shared resources is therefore widely accepted. It would be difficult to identify the precise limits and nature of the obligation to exchange information but the broad principle is accepted. The particular articulation of the obligation is perhaps best left to the negotiation of specific multilateral and bilateral agreements.[44] In fact, both the ECE Convention and the U.S.-Canada Memorandum of Intent (discussed later in the article), provide excellent examples of this process of concretion.

2.2.3 The Duty to Consult and to Negotiate[45]

On receipt of notification of a proposed project or undertaking (such as a new metal smelter, or coal-fired power plant) which may have a substantial polluting effect, the affected state may wish to enter into further discussions with a potential polluter, with a view to suggesting modifications or alternatives. For example, the receiving state might wish to suggest the

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[44]The need for specific agreements within the framework of a broad set of rules has been recognized by the ILC in the context of international watercourses: see note 16 and 40.

[45]See Levin, *supra*, note 34 and Bourne, "Procedure in the Development of International Drainage Basins: The Duty to Consult and Negotiate" (1972), 10 Cdn. Y.B. of Int'l Law 212.

use of different fuels, or a different method of combustion, or even the installation of scrubbers. Is the other state under any duty to respond in good faith and consider proposals which may be put forward? Once again, international practice as manifested in bilateral agreements and the resolutions of international organizations, lends strong support to the value of consultation on such issues. Principle 7 of the OECD Recommendation on Principles Concerning Transfrontier Pollution recommends that:[46]

> Countries should enter into consultation on an existing or foreseeable transfrontier pollution problem at the request of a country which is or may be directly affected and should diligently pursue such consultations on this particular problem over a period of time.

Similarly, the Athens Resolution of the Institute of International Law on Pollution of International Rivers and Lakes[47] provides that basin states shall, as far as practicable, "consult with each other on actual or potential problems of transboundary pollution."

In some cases, particularly with respect to international river basins and boundary waters, consultation may be formalized through an institutional mechanism such as a joint commission. The International Joint Commission (IJC) established by the Boundary Waters Treaty[48] between the U.S. and U.K. (Canada) (discussed *infra*) provides an example of this technique, as does the Chad Basin Commission.[49]

The extent to which the U.S. and Canada follow a practice of prior consultation and negotiation was considered in the 1979 report of the American and Canadian Bar Associations' Joint Working Group on the Settlement of International Disputes. The report noted that apart from the IJC and some other limited examples "there has been little serious or sustained effort to regularize prior consultations between the two Governments."[50] However, the working group was of the opinion that a regime of prior consultation, founded upon a *legal* obligation, should be given serious consideration by the two governments, as part of a system of dispute avoidance.[51]

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[46]*Supra*, note 43, and see also Principle 5 of the UNEP Principles, *supra*, note 16.

[47]Article 7(1)(d), Resolution of the 59th Session of the Institute of International Law, Athens, September 12, 1979, adopting the work of the Committee on the Pollution of International Rivers and Lakes.

[48]Treaty Between the United States and Great Britain Relating to Boundary Waters, and Questions Arising between the United States and Canada, Washington, January 11, 1909, T.S. 548, and Ruster, X at 5148.

[49]Convention and Statute Relating to the Development of the Chad Basin, Fort Larry, 22 May 1964, especially Articles 6 and 9 of the Statute of the Chad Basin Commission, reproduced in Ruster, XI at 5633; Agreement Concerning the Niger River Commission and the Navigation and Transport on the River Niger, Niamey, November 25, 1964 Ruster, XI at 5648.

[50]Report and Recommendations of the American and Canadian Bar Associations' Joint Working Group on the Settlement of International Disputes, March 20, 1979, para. 210.

[51]*Id.*, para 211. The report was primarily concerned with dispute settlement rather than dispute avoidance: for an historical critique see Wang, "Adjudication of Canada-United States Disputes" (1981), 19 Cdn. Y.B. of Int'l Law 158.

The duty to consult is also enshrined in regional agreements on the environment. For example, Article 11 of the Convention on the Protection of the Environment between Denmark, Finland, Norway and Sweden provides that:[52]

> Where the permissibility of environmentally harmful activities which entail or may entail considerable nuisance in another Contracting State is being examined by the Government or by the appropriate Minister or Ministry of State in which the activities are being carried out, consultations shall take place between the states concerned if the Government of the former state so requests.

The duty to negotiate encompasses the duty to negotiate in good faith with a view to reaching agreement on a particular problem.[53] It does not extend to an obligation to reach agreement or to accept the reasonable proposals of the other state.[54] In the absence of agreement, negotiations need only be carried on for a reasonable period of time. Some support for the obligation to negotiate can be derived from the discussion of the International Court of Justice in the *Fisheries Jurisdiction*[55] case and the *Northern Continental Shelf*[56] case. However, while the obligation to negotiate also finds some support in framework conventions[57] it is doubtful whether it could be said to have hardened into a rule of customary international law in the specific field of transboundary pollution control.

This conclusion must however be read in the light of recent consideration of the duty to negotiate by the International Law Commission in the context of drafting articles on the law of non-navigational uses of international watercourses.[58] Article 3(3) of the proposed articles provides that:

> Insofar as the uses of an international watercourse system may require, system states shall negotiate in good faith for the purpose of concluding one or more system agreements.

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[52]*Supra*, note 15.

[53]UNEP Principle 7 suggests that exchange of information, notification consultation, and other forms of co-operation regarding shared natural resources are carried out on the basis of the principle of good faith and in the spirit of good neighbourliness and in such a way as to avoid any unreasonable delays either in the forms of co-operation or in carrying out development or conservation projects; *supra*, note 16.

[54]*North Sea Continental Shelf* case [1969] I.C.J. Rep. 3, 46 to 47, and Bourne, *supra*, note 43.

[55][1974] I.C.J. Rep. 3, 31 to 32.

[56]*Supra*, note 52.

[57]See for example: the Convention on the Conservation of Migratory Species of Wild Animals, Bonn, 23 June, 1979 reproduced in (1980) 19 Int'l Leg. Mat. 15. States parties "shall endeavour to conclude Agreements covering the conservation and management of migratory species . . ." Art. II (3) & IV (3). Article V of the Convention species guidelines for agreements; Third United Nations Conference on the Law of the Sea, Montego Bay, 10 December 1982 A/CONF.62/122, reproduced in (1982) 21 Int'l Leg. Mat. 1261 esp. Arts. 123, 118, 197; Convention Relating to the Development of Hydraulic Power Affecting More than One State, Geneva, December 9, 1923, 36 LNTS 81; Ruster, XI 5506, Art. 3. It is however notable that the ECE Convention on Long-Range Transboundary Pollution does not explicitly provide for the negotiation of bilateral agreements to resolve particular problems; see discussion *infra*.

[58]*Supra*, note 16.

In its commentary on the Article, the Commission suggests that "an obligation to seek to conclude system agreements flows from customary international law in the light of its current development."[59] In reaching this conclusion the ILC relies heavily on the *North Sea Continental Shelf* Cases and on an analogy between the unity of shelf resources and the unity of resources in a river basin. Arguably, the Commission's reasoning can be extended to other shared resources such as "an air-shed or air mass above the territories of a limited number of states"[60] and therefore may be applicable to the particular problem of transfrontier air pollution.

At the outset of this section on procedural law, we noted that there have been two major streams in the development of procedural obligations. Thus far we have focused on the procedural obligations owed by one state to another. The second development is the adoption of the principles of equal access and non-discrimination. These principles find particular support in the Nordic Environment Convention, the work of the OECD in the 1970s, and the recent Draft Treaty on a Regime of Equal Access and Remedy in Cases of Transfrontier Pollution developed by the American Bar Association and the Canadian Bar Association. Personnel from both the United States and Canada participated in the formulation of the OECD Principles.

The Nordic Environment Convention[61] contains two articles of particular note on the subject:

> Article 2
>
> In considering the permissibility of environmentally harmful activities, the nuisance which such activities entail or may entail in another Contracting State shall be equated with a nuisance in the State where the activities are carried out.
>
> Article 3
>
> Any person who is affected or may be affected by a nuisance caused by environmentally harmful activities in another Contracting State shall have the right to bring before the appropriate Court or Administrative Authority of that State the question of the permissibility of such activities, including the question of measures to prevent damage, and to appeal against the decision of the Court or the Administration Authority to the same extent and on the same terms as a legal entity of the State in which the activities are being carried out.
>
> The provisions of the first paragraph of this Article shall be equally applicable in the case of proceedings concerning compensation for damage caused by environmentally harmful activities. The question of compensation shall not be judged by rules which are less favourable to the injured party than the rules of compensation of the State in which the activities are being carried out.

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[59] *Id.*, at 114.

[60] Report of Executive Director of UNEP, *supra*, note 16.

[61] *Supra*, note 15.

Clearly such articles and procedures are limited by the extent to which it is possible to identify a particular activity in another state which is causing the pollution. Nevertheless, in appropriate circumstances, it does provide a means of internalizing the cost of pollution.

As interpreted by the OECD, equal right of access has two basic elements—access to the same information and notice as citizens and groups would have in the polluting state; and the right to participate in, and have standing before, all manner of public authorities and judicial and administrative hearings, in order to make objections, obtain compensation or bring to a halt proposed undertakings. The OECD sees the principle of equal right to access as being a specific facet of the principle of non-discrimination which was first developed by the OECD in its Council's 1974 Recommendation on Principles Concerning Transfrontier Pollution. The elements of non-discrimination include:[62]

— transfrontier polluters should be subject to legal or statutory provisions no less severe than those which would apply for any equivalent pollution occuring within their country;

— the levels of transfrontier pollution should not exceed those considered acceptable inside the country in which it originates;

— any country which applies the Polluter-Pays Principle should apply it to all polluters even if the effects are felt outside the country;

— persons affected by transfrontier pollution should be granted no less favourable treatment than persons affected by a similar pollution in the country from which such transfrontier pollution originates.

The Principles on equal access and non-discrimination were further fleshed out by the OECD in the Council's 1977 Recommendation for Implementation of A Regime of Equal Right of Access and Non-Discrimination in Relation to Transfrontier Pollution, which recommended that members "take into account the principles . . . possibly on the basis of reciprocity, notably regarding individual rights, and in bilateral or multilateral agreements."[63] This later recommendation adds to the earlier principles, by recommending greater exchange of information and consultation so as to permit individuals and non-profit associations to avail themselves in a timely manner of the opportunities of equal access.

The work of the CBA-ABA Joint Working Group on the Settlement of International Disputes[64] has not carried these principles any further forward. The limited achievement of this group has been to integrate the basic elements of the two OECD principles into the terms of a Draft Treaty on a Regime of Equal Access and Remedy in Cases of Transfrontier Pollution.[65] The CBA-ABA group specifically acknowledged its debt to the

[62]*Supra*, note 43, Title C.

[63]Reprinted in OECD, *Legal Aspects of Transfrontier Pollution*, Paris, 1977 at 29.

[64]*Supra*, note 50.

[65]*Id.*

OECD and, in practically all cases, preserved the original OECD language.[66] The Group saw the draft treaty as an experiment which might later be extended to other areas of common concern besides pollution.

2.3 Conclusion

The customary international law applicable to transboundary air pollution has developed rapidly over the last two decades. Nevertheless, the principles remain rather vague and difficult to apply in particular situations. Furthermore, in the substantive context, the suggestion has been made that the present customary rules do not establish a sufficiently stringent or concrete test of responsibility when dealing with such a diffuse problem as acid rain. A customary regime encounters particular difficulty in dealing with entrenched practices and standards of behaviour. State practice, by its very nature, is unlikely to disclose a requirement that states roll back existing levels of emissions. More stringent tests and greater specificity can only be developed, in the short run, through the negotiation and implementation of bilateral and, where appropriate, multilateral conventions. The principles of customary law provide a basis for these negotiations and a set of standards and rules which may be improved by the development of a more specific body of law.

In the following section we review a significant multilateral initiative, with respect to the problem of acid rain in which both Canada and the United States participated—the ECE Convention on Long-Range Transboundry Air Pollution. We will then go on to consider the bilateral approaches to the problem which have been developed between the United States and Canada.

3. Multilateral Efforts: The ECE Convention on Long-Range Transboundary Air Pollution[67]

3.1 Introduction

The United Nations Economic Commission for Europe (ECE), under whose auspices the Convention was drafted, was established in 1947 as one of the five regional economic commissions of the U.N. The ECE has 36 members including both western and eastern European states and the United States of America and Canada. Its unique composition, similar perhaps only to the Helsinki Conference on Security and Cooperation in Europe, made it peculiarly suitable as a sponsor for a convention on long-range transboundary air pollution, since, unlike the OECD it includes both western and eastern European countries. The ECE also bridges the Atlantic and although pollution from Europe does not appear to have a significant

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[66] *Id.*, paras 304 to 305.

[67] Geneva, November 13, 1979, (1979) 18 Int'l Leg. Mat. 1442, and for commentary see Rosencranz, "The ECE Convention of 1979 on Long-Range Transboundary Air Pollution" (1981), 75 A.J.I.L. 975.

impact on North America, and *vice versa*, the problems of transfrontier pollution are similar. The nature of the distribution of pollution, however, differs in one important respect. In Europe, the north European countries, particularly Sweden and Norway, receive heavy pollution from the United Kingdom, France, West Germany and the Benelux countries due to prevailing wind directions and type of industry, but generate relatively little pollution themselves. By contrast, in North America, both the United States and Canada are significant producers of acid emissions. Annual SO2 emissions are estimated at 4.8 million tonnes in Canada and 24 million tonnes in the U.S.[68] But while there is a net flux of acid emissions north across the border, Canadian emissions are estimated to be responsible for 25% of the acid rain in the New England States.[69] This distribution of pollution in North America has the consequence that the costs and benefits of cutting back acid emissions would not be entirely one-sided. In addition Canadian politicians can rely upon some self-interested support (especially from the New England States) for their position south of the border.

The ECE has a long history of interest and involvement in the problems of air pollution. A Working Party on Air Pollution Problems was established within the ECE as early as 1969,[70] and in 1971 the ECE convened in Prague the ECE Symposium on Problems relating to the Environment, which led to the creation of a new Subsidiary Body, the Senior Advisors to ECE Governments on Environmental Problems. In June 1978 the Committee of Senior Advisors established a Special Group on Long-Range Transboundary Air Pollution. It was the work of this committee which led to the drafting of the Convention, which was adopted in 1979 at an ECE High Level Meeting on the Protection of the Environment.[71] The final draft of the convention was essentially a compromise between the Nordic countries, who wished to obtain at least a standstill on the level of sulphurous emissions, if not a roll-back, and West Germany and the United Kingdom who were agreeable to broad statements of principle but not positive obligations or concrete limits on emissions.[72] The Convention has now entered into force, having been ratified by twenty-four parties including Canada and the USA.

Our analysis of the Convention will be divided into three parts—first a review of its substantive provisions, second, a survey of the procedural rules imposed, and finally, implementation, including a review of the first meeting of the Executive Body in June 1983.

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[68]*Memorandum of Intent, Executive Summary*, *supra*, note 4, Work Group 3B, at 3. The figures are for 1980.

[69]Wetstone and Rosencranz, *supra*, note 1, at 94, referring to the U.S.-Canada *Memorandum of Intent on Transboundary Air Pollution*, Atmospheric Modelling, Work Group 2, *Interim Report*, February, 1981 at A8-15.

[70]I.N. van Lier, *Acid Rain and International Law*, Toronto, 1981 at 147.

[71]*Id.*, at 147 to 148 and Wetstone and Rosencranz, *supra*, note 1, at 140 to 144.

[72]Rosencranz, *supra*, note 67, at 976.

3.2 Substantive Provisions

The Preamble to the Convention begins by "considering" Principle 21 of the Stockholm Convention.[73] The Principle is merely referred to in the Preamble and is not expressly adopted in the body of the Convention itself. Indeed, there is nothing substantive in the Convention text as strongly worded as this Principle. Article 2 merely states that the parties:

> taking due account of the facts and problems involved, are determined to protect man and his environment against air pollution and shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution.

The Article is subject to significant qualifications, such as: "taking due account", "endeavour to limit", and "as far as possible". Clearly it requires neither a roll-back of emissions nor a firm commitment not to increase emissions.

It is notable that the Convention does not even specifically and unequivocally acknowledge the relationship between air pollution and damage. Thus, the preamble simply refers to "possible adverse effects" which might result from air pollution and the possibility that a rise in emission levels "may increase such adverse effects."

A significant concern of the Convention is the need to encourage more research on acid rain. This in part is linked to the provisions quoted above from the preamble, in that some of the heavily industrialized European states such as West Germany and the United Kingdom were demanding more solid evidence of a cause-and-effect relationship between acid emissions and degradation of the environment in another country before commiting themselves to reducing emissions. The commissioning of further research could also be used as a tactic to forestall the need to take more expensive action to reduce pollution, while at the same time documenting the costs of pollution-control measures. Article 7 of the Convention therefore provides that the Contracting Parties shall initiate and conduct research "as appropriate to their needs." In practice the polluting states have conducted research on the technical and economic feasibility of reducing emissions, while the receptor states have concentrated on such matters as the effect of sulphur compounds on human health and the environment.[74]

Two other substantive goals are enunciated in the Convention, albeit in rather weak language. First, Article 3 requires the contracting parties to develop "without undue delay policies and strategies which shall serve as a means of combating the discharge of air pollutants . . ." Second, and particularly with respect to new or rebuilt installations, the parties undertake "to develop the best policies and strategies . . . and control measures

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[73]Quoted, text to note 27, *supra*.

[74]Personal Communication, Environment Canada, October 14, 1983.

compatible with balanced development . . . by using the best available technology which is economically feasible and low- and non-waste technology." Once again the effect of these provisions is severely diluted by phrases such as "undue delay" and "economically feasible."

Article 4 of the Convention is phrased more like a procedural obligation but it does contain a substantive notion as well—albeit weak. The article calls for the exchange of information and the review of policies aimed at combating pollution ". . . thereby contributing to the reduction of air pollution including long-range transboundary air pollution."

One can conclude that the Convention itself does not impose enforceable emission standards on the Parties. Indeed it is doubtful if the Convention in its substantive elements has proceeded much beyond rules of customary international law, based on sources such as Principle 21 of the Stockholm Convention, and the principle of *sic utero tuo ut alienum non laedas*, discussed above.

3.3 Procedural Rights and Duties

The Convention is much stronger on the procedural side than the substantive. Indeed in this area the Convention represents an important step forward, providing the procedural rights on which important developments in substantive law may be based. The Convention provides for consultation, exchange of information, and dispute settlement, as well as future cooperation through the medium of the Executive Body designated by the Convention—the Senior Advisors to ECE Governments on Environmental Problems. This body, which we deal with in more detail in the context of implementation, is required under the Convention to meet at least annually.

The Executive Body is expected by the Convention to be instrumental in facilitating the required exchange of information, but Article 8 also requires bilateral exchange of information on:

- data emissions coming from rigid units of agreed size;
- major national policy changes, which would be *likely* to cause *significant* changes in pollution;
- control technologies and costing of emission control;
- the effects of pollution.

It should be noted that even the language of this article is qualified by words such as "likely to" and "substantial". In addition the exchange is limited to "available" information. There is nothing that requires a contracting party to develop new data or arguably even to manipulate existing data.

Associated with the exchange of information is the support given by the contracting parties to the implementation of the existing "Co-operative

programme for the monitoring and evaluation of the long range transmission of air pollutants in Europe"[75] (EMEP). EMEP developed out of the United Nations Environment Programme's Global Environmental Monitoring System (GEMS), which had been established with the mandate of collecting environmental data in an orderly and adequate manner to facilitate environmental management.[76] The focus of EMEP was the monitoring of sulphur dioxide and related substances. The convention emphasized the desirability of the Contracting Parties "joining in and fully implementing EMEP" and exchanging data.[77] The parties also agreed to emphasize "the desirability of extending the national EMEP networks to make them operational for control and surveillance purposes."[78] It should be noted that the geographical scope of EMEP does not extend to North America.

The strongest language of the Conventions appears in Article 5 and is reserved for the obligation to consult:

> Consultations shall be held, upon request, at an early stage between . . . Contracting Parties which are actually affected by or exposed to a significant risk of long-range transboundary air pollution and . . . Contracting Parties within which and subject to whose jurisdiction a significant contribution to long-range transboundary pollution originates, or would originate in connexion with activities carried on or contemplated therein.

This clause is remarkably wide in scope. It extends to contracting parties who are merely exposed to a significant risk of pollution and it extends to countries which may *contemplate* activities which could make a significant contribution to long-range transboundary pollution. Of course consultation is merely a beginning, and does not itself suggest a particular solution. It does however provide the means for an exchange of views and a mechanism for the potentially-affected party to object to particular proposals and suggest alternative means of reaching the same policy or industrial goals. Consultation may also encourage the development of bilateral agreements although the Convention itself does not specifically envisage such bilateral accords. Neither does the Convention specifically call for further bilateral or multilateral *negotiations* between the Parties. Article 11 of the Convention does call for negotiated solutions, but only to disputes involving "the interpretation or application of the Convention."

3.4 Implementation

The Convention entered into force in March 1983, ninety days following the twenty-fourth ratification. However, the Parties had agreed to the development of a research programme prior to that date by means of

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[75]Convention, Article 9.

[76]Report of the Executive Director of UNEP on GEMS, UNEP/GC/31/Add.2, February 25, 1975.

[77]Convention, Article 9(e).

[78]Convention, Article 10(3).

a resolution adopted by the ECE at the same High Level Meeting at which the Convention text was accepted for signature.[79] This resolution called upon the ECE to provide secretariat services to coordinate the research. It also called upon signatories to the Convention to "attach highest priority to the completion of a document setting out the strategies and policies of each of the signatories for the abatement of air pollution caused by sulphur compounds." By June 1982, the Executive Secretary of the ECE was able to report that:[80]

> Almost all of the signatories to the Convention have submitted extensive information on their strategies and policies regarding control of air pollution. Most countries have now adopted legal and regulatory provisions in respect of sulphur dioxide which include ambient air quality standards; emission standards; sulphur content of fuels; licence and permit systems; technical, economic and planning measures; and over-all control strategy plans.

This interim program of research and gathering of data permitted the speedy consideration of particular problems by the Executive Body at its first meeting.

The first session of the Executive Body for the Convention was convened in Geneva from 7 to 10 June, 1983 and was attended by 30 contracting parties and signatories.[81] Representatives from the United Nations Environment Programme, other United Nations agencies, and several non-governmental organizations were also present. At the meeting the Nordic countries proposed a concerted programme for a 30 percent reduction of sulphur emissions by 1993, using 1980 as a basis for calculation.[82] A proposal for the reduction of nitrous oxide emissions was also tabled. However a number of delegations expressed the view that specific targets for SO2 emissions were premature and that priority should instead be given to further research, particularly on the economic impact of different control programmes.[83]

On the basis of these discussions the Executive Body adopted a Decision on Strategies and Policies,[84] dealing with the implementation of the over-all work programme of the Convention. The Decision recognized the need to effectively decrease the total annual emissions of sulphur compounds by 1993/1995 using 1980 emissions levels as a basis for calculation. The recognition of a *need* to reduce emissions would seem to take us beyond

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[79]ECE Resolution on Long Range Transboundary Air Pollution, 13 November, 1979, reproduced at (1979) 18 Int'l Leg. Mat. 1450.

[80]Proceedings of the 1982 Stockholm Conference on Acidification of the Environment, June 21-30, 1982 at 22.

[81]Report of the First Session of the Executive Body for the Convention on Long-Range Transboundary Air Pollution, ECE/EB.AIR/1, 28 June 1983.

[82]*Id.*, para. 15.

[83]*Id.*, para. 20.

[84]*Id.*, para. 25, Decision A (1).

the substantive provisions of the Convention itself, although no specific targets for reductions were agreed to. Moreover, the existence of 1980 emission level data, made available as a result of the research programme, represents an important step in any strategy to reduce or control emissions. The Executive Body also agreed that information on national measures to decrease emissions should be reported to the secretariat for the next meeting, with further programmes for reduction of sulphur emissions being developed for the third meeting of the Executive Body.

The Decision of the Executive Body was a consensus resolution, with the exception that the United States Government "was in the process of considering a major review of options for addressing the acid precipitation problem, and had to avoid specific commitments at present which might in any way prejudice the outcome of this review.[85] The Canadian delegation expressed its regret at this abstention.

The Executive Body also considered a number of reports, including one by an ECE Working Group on Effects of Sulphur Compounds on the Environment, a Report of a Meeting on Cost-Benefit Analysis of Sulphur Emission Control and a report by GEMS. However, no action was taken on these and the parties simply agreed to circulate them.

A particular concern at the meeting was the future funding of EMEP. EMEP originally received funding from UNEP, but this was due to terminate at the end of 1984, and in any event required supplementing before that date. The Executive Body therefore adopted a recommendation suggesting the necessity of providing long-term funding for EMEP through a protocol or annex to the Convention.[86] The recommendation urged that all contracting parties within EMEP's geographical area ought to contribute, while those outside (i.e., Canada, USA) should be invited to contribute. It was envisaged that such a protocol could be ready for signature for the second meeting of the Executive Body, currently scheduled for September 1984.

As well as funding EMEP, UNEP supported the implementation of the ECE Convention during the period prior to its official entry into force. From 1981, UNEP designated one professional and one general service post for work associated with the implementation of the Convention.[87] The support is due to cease at the end of 1983, which raised the question of the funding of a professional post by contracting parties. This possibility was rejected by the Contracting Parties on the grounds that Article II of the Convention required that secretariat functions would be carried out for the Executive Body by the Executive Secretary of the ECE.[88] It has

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[85] *Id.*, para. 26.

[86] Recommendation on Short- and Long-Term Financing of Co-operative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe (EMEP), *id.*, Annex II.

[87] *Supra*, note 80 at 24.

[88] *Supra*, note 81 at para. 40.

been suggested, however, that the ECE secretariat has insufficient resources to play a very active role in implementation of the Convention,[89] despite a resolution passed by the ECE on the occasion of the signature of the Convention, that the necessary authority be given the ECE and its Executive Secretary "to provide for a sufficient secretariat and, *in the framework of the existing budgetary structure*, for the appropriate financial means . . ."[90]

3.5 Evaluation of the Convention

The Convention does not impose strongly worded substantive obligations on the contracting parties, and there is no requirement for them to limit or reduce transfrontier pollution by specific amounts within a set period of time. Such substantive obligations as exist are limited by qualifying terms such as "endeavour to limit" and "as far as possible." The Convention is much stronger on procedure, and imposes obligations to exchange information, monitor emissions of fluxes, and consult affected parties. Nevertheless, in practice it may be that the provisions with respect to implementation turn out to be the most important, given that the meetings of the Executive Body provide a regular opportunity, both for formal consultation and exchange, and for the review and criticism of the performance of all parties in implementing the Convention. Moreover, if the first meeting of the Executive Body can be used as a guide, it is apparent that some of the contracting parties will be willing to attempt to use these meetings and their resolutions to supplement the deficiencies in the substantive aspects of the Convention. For example, Executive Body Resolutions/Decisions might conceivably be used to impose specific reductions in acid emissions. The efficaciousness of such an approach would require an examination of the normative effect of such resolutions—a task which is unfortunately beyond the scope of this paper.[91]

Nevertheless, the inclusion of a procedure which may be used to expand the rather limited obligations of the Convention is to be welcomed. In the context of U.S.-Canada problems the first meeting of the Executive Body has proven somewhat less useful than it might otherwise have been, in view of U.S. abstention from the one important decision of the Body. Nevertheless, such meetings may provide a useful multilateral forum in which the Nordic states and Canada could establish common cause to publicize their case and to press for concessions from the polluting states. Similarly, information collected under the Convention may be used in a bilateral, as well as multilateral, context, to provide support for the Canadian position.

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[89]Rosencranz, *supra*, note 67 at 979.

[90]*Supra*, note 79, emphasis supplied.

[91]The value of an ongoing consultative process is well illustrated by the consultative mechanism established by Article 9 of the Antarctic Treaty, Washington, December 1, 1959, 402 UNTS 71. The Antarctic Treaty Consultative Meetings have been instrumental in the development of two further multilateral conventions applying to the region: Conference on the Conservation of Antarctic Marine Living Resources, Canberra, May 20, 1980 reporduced in (1980) 19 Int'l Leg. Mat. 837 and the Convention for the Conservation of Antarctic Seals, London, June 1, 1972, reproduced in (1972) 16 Polar Record 435.

4. Bilateral Efforts

4.1 Introduction

While multilateral efforts to deal with transfrontier air pollution are of relatively recent vintage, the problem has been the subject of bilateral action by Canada and the United States for some time. Apart from the *Trail Smelter* Arbitration in the 1930s and 40s, the International Joint Commission has had some formal involvement with respect to transboundary air quality since the 1960s.

A more important distinction from the multilateral context however is the lengthy history of Canada-U.S. cooperation with respect to transboundary water resource management. Specifically, the existence of the IJC and its over-seventy-years experience provides a foundation of shared understanding (on both principles and procedures) that does not exist in multilateral fora. This part of the paper therefore focuses upon acid rain as one in a series of transboundary resource problems that have emerged in the history of Canadian-American relations.

We begin with a brief consideration of the IJC itself, and continue with a discussion of its role under the Great Lakes Water Quality Agreements of 1972 and 1978, which themselves raised in a peripheral way the issue of transboundary air pollution. This approach is contrasted with that which was eventually adopted to deal with acid rain—the Memorandum of Intent process. Although this process draws to some extent on the approach taken to resolve other transfrontier pollution issues, we also suggest that it differs in some vital respects.

4.2 Boundary Waters Treaty

The Boundary Waters Treaty of 1909,[92] although not concerned primarily with pollution,[93] is a landmark in United States-Canada cooperation with respect to management of shared resources and resolution of boundary disputes. The treaty itself followed a lengthy period of negotiations, which were spurred by a series of particular problems that had arisen before the turn of the century.[94] The treaty then was an early attempt to provide a comprehensive mechanism for resolving an array of transboundary problems, both current and future.

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[92]*Supra*, note 48.

[93]An exception is the provision, appearing almost as an afterthought, in Article 4:

> It 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.

[94]For a lucid description of the background to the treaty, see Dreisziger, "Dreams and Disappointments" in R. Spencer, J. Krton, and K.R. Nossal, (ed.), *The International Joint Commission Seventy Years On*, Toronto, 1981, at 8 to 23.

The most significant aspect of the treaty is of course the mechanism put in place for dispute avoidance and resolution: the International Joint Commission. As a rare example of institutionalization of bilateral dispute resolution by the United States and Canada the IJC deserves some comment. Although the IJC is given a wide array of powers—quasi-judicial,[95] arbitral,[96] investigative;[97] it has been hampered in the range of issues it may address by the lack, with perhaps one limited exception (discussed *infra*), of an independent power to initiate proceedings on any issue. Moreover, there has been a reluctance to enlarge the IJC's mandate to include such powers.[98]

In the result, the IJC has, by and large (with a few notable exceptions), dealt with issued that have lacked a high 'political' content. To some extent the IJC's success, and high reputation as an effective and natural body, are owed to the rather narrow interpretation that has been given to its role.[99] It must be questioned then whether the model of the IJC is an appropriate one for coming to grips with the now highly-charged issue of acid precipitation—despite the fact that the IJC in recent years has been given some limited responsibility with respect to air pollution.[100]

Apart from its creation of the IJC the Boundary Waters Treaty is interesting for a number of other rights—both substantive and procedural—that it creates. The most important of these for our purposes is the provision in Article II:

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[95]Thus the provision in Article 8 of the treaty the IJC "shall have jurisdiction over and shall pass upon all cases involving the use or obstruction or diversion of [certain] waters . . ." A useful discussion of the different powers of the Commission can be found in Willoughby, "Expectations and Experience, 1909-1979", in *id.*, at 22 to 42.

[96]As provided for in Article 10:

> Any questions or matters of difference arising between the High Contracting Parties involving the rights, obligations, or interests of the United States or of the Dominion of Canada either in relation to each other or to their respective inhabitants, may be referred for decision to the International Joint Commission by the consent of the two Parties . . .

However, the power has never been used, see Wang, *supra*, note 51 at 165 to 166: "The role of the IJC may be considered as being more in the nature of the regulatory, investigative, or fact-finding body rather than a judicial or arbitral body."

[97]Article 9 provides in part:

> The High Contracting Parties further agree that any other questions or matters or difference arising between them involving rights, obligations, or interests of either in relation to the other or to the inhabitants of the other, along the common frontier between the United States and the Dominion of Canada, shall be referred from time to time to the International Joint Commission 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.

[98]See Cadieux, "The View from the Pearson Building", in *The International Joint Commission Seventy Years On*, *supra*, note 94, at 99.

[99]On which point see Willoughby, *supra*, note 95, *passim*.

[100]Including the 1966 reference on Air Pollution in Detroit-St. Clair River areas and the 1975 Air Quality reference under which the Commission reports annually on Michigan-Ontario air pollution. More general responsibilities with respect to transboundary observation rest with the International Air Pollution Advisory Board. See "IJC References and Applications, 1912-1977", in *The International Joint Commission Seventy Years On*, *supra*, note 94 at 142 to 151.

> . . . it 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; but this provision shall not apply to cases already existing or to cases expressly covered by special agreement between the parties hereto.

This provision for "equal access" is particularly interesting in light of attempts in recent years to provide increased access in the field of transboundary pollution generally (discussed *supra*).

4.3 The Great Lakes Water Quality Agreements of 1972 and 1978

The Great Lakes Water Quality Agreements of 1972[101] and 1978[102] suggest an alternative approach to bilateral management of transfrontier pollution problems, albeit one that builds on the approach of the Boundary Waters Treaty. The mechanism central to implementation is the IJC, assisted by two advisory boards, but the role contemplated for the Commission is somewhat different from what it has assumed in the past.

The Agreements arose out of a number of problems which gained prominence in the 1960s and 1970s, related to both quality and levels of water in the Great Lakes.[103] In 1964 the Canadian and U.S. governments agreed on two important references to the Commission—one concerning levels of the Great Lakes and the other concerning pollution of the Lower Great Lakes (including Ontario, Lake Erie and the international portion of the St. Lawrence River).[104]

The Lower Great Lakes Pollution Reference is particularly significant, not only for the broad range of the Commission's inquiry and the numerous technical reports and recommendations that emerged over the life of the Reference (culminating in the Commission's final report in January 1971),[105] but also because the Reference led directly to the Great Lakes Water Quality Agreement of 1972. Even before the final report, the work of the joint technical boards had raised environmental concerns from a scientific to a public (and political) issue. By June of 1970 a Working Group of national, state and provincial representatives had been agreed upon to report back on possible options with respect to Great Lakes pollution. A key recommendation of the final report of the Working Group in 1971 was that

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[101]Agreement Between The United States of America and Canada on Great Lakes Water Quality, Ottawa, April 15, 1972 reproduced in Ruster, X at 5292.

[102]Agreement Between Canada and The United States of America on Great Lakes Water Quality, 1978, Ottawa, November 22, 1978 reproduced in Ruster, XXVI at 19.

[103]For a detailed discussion of the problems which gave rise to the Agreements (and more especially the 1972 Agreement) see Bilder, "Controlling Great Lakes Pollution: A Study in United States-Canadian Environmental Cooperation", (1972) 70 Mich. L.R. 469.

[104]Docket numbers 82 and 83 respectively.

[105]For a discussion of activities under the Reference, see Biler, *supra*, note 103, at 495 to 501.

Canada and the U.S. should negotiate a comprehensive agreement with respect to water quality for the Great Lakes.[106] This recommendation was accepted and led to the negotiation of the Great Lakes Water Quality Agreement of 1972.

The 1972 Agreement, and the 1978 Agreement, which is essentially a refinement of the former, are significant for both their substantive and procedural content. Substantively, the Agreements employ the technique of "adopting" a number of "General Objectives"[107] which are augmented by Specific Objectives,[108] detailed in an Annex to each Agreement.[109] These General and Specific Objectives are supplemented by a provision for the development and implementation of a range of programmes designed to implement the water quality standards agreed upon.

Perhaps of more interest for our purposes are the procedural aspects of the Agreements, especially insofar as they may have implications for dealing with the problem of acid precipitation. A number of procedural duties are imposed on the signatories. Some are unexceptional, for example, the provisions dealing with consultation and review;[110] however, at least one procedural duty—exchange of information—goes beyond what would normally be expected. While a commitment to cooperate on exchange of information is not unusual, both the 1972 and 1978 Agreements cast this duty in mandatory language:

> SUBMISSION AND EXCHANGE OF INFORMATION
>
> 1. The International Joint Commission shall be given at its request any data or other information relating to water quality in the Great Lakes System in accordance with procedures established by the Commission.
>
> 2. The Commission shall make available to the Parties and to the State and Provincial Governments upon request all data or other information furnished to it in accordance with this Article.

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[106]For a history of the Working Group, see *id.*, at 501 to 502.

[107]See Article III of the 1978 Agreement which provides under five general objectives that the waters "should" be free from substances (or heat), resulting from human activities, that have adverse effects on water or aquatic life.

[108]Article IV of the 1978 Agreement.

[109] Annex 1, 1978 Agreement. The objectives are quite detailed; for example the first provides:

> 1. CHEMICAL
>
> A. Persistent Toxic Substances
>
> (a) Organic
>
> Aldrin/Dieldrin
>
> The sum of the concentrations of aldrin and dieldrin in water should not exceed 0.001 microgram per liter. The sum of concentrations of aldrin and dieldrin in the edible portion of fish should not exceed 0.3 microgram per gram (wet weight basis) for the protection of human consumers of fish.

[110]Article X and Article IV(3) of the 1978 Agreement.

> 3. Each Party shall make available to the other at its request any data or other information in its control relating to water quality in the Great Lakes System.
>
> 4. Notwithstanding any other provision of this Agreement, the Commission shall not release without the consent of the owner any information identified as proprietary information under the law of the place where such information has been acquired.[111]

Also of some significance are the reporting powers of the IJA under the Agreements. Apart from the normal duty to report back to the Parties on a regular basis, the Agreement also permits the Commission considerable initiative with respect to preparing and distributing reports on its own motion:

> Article VII
>
> 3. . . . The Commission may at any time make special reports to the Parties, to the State and Provincial Governments and to the public concerning any problem of water quality in the Great Lakes System.
>
> 4. The Commission may in its discretion publish any report, statement or other document prepared by it in the discharge of its functions under this Reference.[112]

Especially with respect to highly "political" issues such as acid precipitation, the power to initiate and publicize reports on "any problem" within a broad mandate could be an extremely important one. This is strengthened of course by the duties with respect to exchange of information and also by the authority granted the IJC to independently verify information and data submitted to it.[113]

Also of interest with respect to possible bilateral models for dealing with acid precipitation are the institutional structures relied upon in the Agreements. While the IJC is given the primary responsibility for implementation of the undertakings, two Boards are also created to assist the Commission in carrying out its responsibilities.

> (a) A Great Lakes Water Quality Board which shall be the principal advisor to the Commission. The Board shall be composed of an equal number of members from Canada and the United States, including representatives from the Parties and each of the State and Provincial Governments; and
>
> (b) A Great Lakes Science Advisory Board which shall provide advice on research to the Commission and to the Water Quality Board. The Board shall further provide advice on scientific matters refered to it by the Commission, or by the Water Quality Board in consultation with the Commission. The Science Advisory Board shall consist of managers of Great Lakes research programs and recognized experts on Great Lakes water quality problems and related fields.[114]

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[111]Article IX of the 1978 Agreement; the 1972 Agreement has an almost identical provision, Article VIII.

[112]1978 Agreement; virtually identical wording can be found in the 1972 Agreement, Article VI (3), (4).

[113]Article VII, 1978 Agreement.

[114]Article VIII (1), 1978 Agreement; the 1972 Agreement provided only for the Water Quality Board.

What emerges from the treaty then is an umbrella agreement with a range of negotiated water quality objectives (both general and specific), objectives which might be considered to represent largely political choices. The implementation of these objectives, and the mandate to "identify and comment on other problems, are left to an essentially non-political body, the IJC, with reliance upon the two jointly-appointed technical boards. The initiative for the former to investigate matters on its own initiative, while certainly limited, is nevertheless significantly greater than contemplated under the Boundary Waters Treaty.

The potential application of such a bilateral structure (whether actually employing the IJC or not) as a mechanism for addressing the problem of acid rain is discussed *infra*. However, it should be noted that as a matter of substance the IJC has already been given some authority with respect to both air pollution generally and the long-range transport of air pollutants specifically.[115] The IJC also is advised on transboundary air pollution generally by the International Air Pollution Advisory Board. Under the Great Lakes Water Quality Agreements programmes are contemplated with respect to:

> Article VI (1)(1) *Airborne Pollutants*. Programs to identify pollutant sources and relative source contributions, including the more accurate definition of wet and dry deposition rates, for those substances which may have significant adverse effects on environmental quality including the indirect effects of impairment of tributary water quality through atmospheric deposition in drainage basins. In cases where significant contributions to Great Lakes pollution from atmospheric sources are identified, the Parties agree to consult on appropriate remedial programs.[116]

Nevertheless, and despite recommendations by both the Great Lakes Science Advisory Board and the International Air Pollution Advisory Board that the IJC become more involved in matters of air quality,[117] both Parties have been unwilling to fund such a role[118] for the Commission. Instead the bilateral process that has become the focus of the acid precipitation debate is the more "political" route of the Memorandum of Intent.

4.4 The Memorandum of Intent

By the late 1970s acid precipitation was becoming a matter of public concern in Canada. As with the earlier problem of Great Lakes pollution, the initial bilateral consultations between the United States and Canada on the matter took the form of a joint technical working group, established "to aid in the coordination of research studies and the exchange of scientific

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[115]See note 100, *supra*. For a fuller discussion of the IJC's role with respect to acid precipitation, see J.E. Carroll, *Environmental Diplomacy*, Ann Arbour, 1983, at 252-255.

[116]1978 Agreement.

[117]For a discussion see Carooll, *supra*, note 115, at 253 to 255.

[118]*Id.*, at 255.

information between the two countries."[119] The United States-Canada Research Consultation Group on the Long-Range Transport of Air Pollutants (the LRTAP Group) was set up by the respective governments in 1978 and held meetings in July 1978 and March 1979. As a result of the meetings the Group agreed on the need for a "clear and concise statement of the LRTAP problem, as well as of its impact on the environment of eastern North America."[120] This took the form of a preliminary overview of the problem, released in 1979.[121] The report is essentially a review of research conducted to that point in time, and the Group was careful to emphasize the incomplete nature of the information base.[122] Nevertheless, of the various air pollution problems, the LRTAP Group clearly targeted acidic precipitation as the source of greatest concern,[123] and noted the "mounting evidence of serious and continuing environmental degradation in eastern North America as a result of acidification."[124] The Group further stressed the need for immediate action and particularly for more complete ecosystem studies, with special emphasis on acid precipitation.[125]

The LRTAP Report acted as a catalyst to a more structured approach to the problem, and despite the failure of Canadian efforts to establish an immediate commitment to the reduction of emissions, the United States was receptive to the concept of joint working groups, similar to those developed earlier to deal with Great Lakes water quality.[126] In the result the United States and Canada during 1979 and 1980 negotiated a Memorandum of Intent (MOI) on the subject of acid precipitation, signed on August 5, 1980 (and which is reproduced as an appendix to this paper).[127] Although the MOI does not include specific commitments to reduce emissions (which Canada has been pressing for[128]), it did go further than multilateral agreements in recognizing the problem, and as a bilateral solution is an interesting example of the Parties building on experience with the Great Lakes Water Quality Agreements.

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[119]LRTAP Report, *supra*, note 2, preface.

[120]*Id.*

[121]*Id.*

[122]*Id.*, at 3.

[123]*Id.*, at 24.

[124]*Id.*, at 25.

[125]*Id.* The LRTAP Report and its conclusions have not been without critics however, especially in the industrial sector; see Carroll, *supra*, note 115, at 242.

[126]For an account of the diplomatic manoeuvrings see Carroll, *supra*, note 115 , at 263.

[127]Memorandum of Intent between the Government of Canada and the Government of the United States concerning Transboundary Air Pollution, August 5, 1980, reprinted in (1981) 20 Int'l Leg. Mat. 1371. The MOI obliges Canada and the U.S. to commence negotiations on "a cooperative agreement on transboundary air pollution". For a consideration of the nature of this obligation, see text to notes 53, 54, *supra*, and A. McNair, *The Law of Treaties*, Oxford, 1961, at 27 to 29.

[128]Carroll, *supra*, note 115, at 263.

The MOI, if for no other reason, is significant for its recognition of the existence of a problem with acid precipitation. Unlike the earlier ECE Convention, for example, there is an acceptance by Canada and the United States in the Preamble that both Parties:

> [s]hare a concern about the actual and potential damage resulting from transboundary air pollution, . . . including the already serious problem of acid rain.[129]

and that

> this is an important and urgent bilateral problem as it involves the flow of air pollution in both directions across the international boundary, especially the long range transport of air pollutants.[130]

Although there is not a formal agreement on the *extent* of the problem, the Parties do at least agree to "note":

> scientific findings which indicate that continued pollutant loadings will result in extensive acidification in geologically sensitive areas during the coming years, and that increased pollutant loadings will accelerate this process.[131]

At the heart of the Memorandum is a statement of intent to both develop a bilateral agreement, and, pending successful negotiations, to take interim actions as available under current authority to control transboundary air pollution. Included under the four headings of interim measures are such traditional procedural elements as notification and consultation with respect to actions creating potential environmental risks, exchange of information from research programmes, coordination of monitoring and evaluation efforts, and development and enforcement of air pollution control measures in consultation with the other Party. Of more interest is the mechanism established to facilitate negotiations on an eventual agreement.

A deadline date (later postponed) for initiation of formal negotiations is established and a commitment is given to establish a Canada/United States coordinating Committee to undertake preparatory discussions immediately. The structure of the Committee is then set out in detail in an Annex to the MOI. The structure adopted is one of five technical/scientific work groups:

1. Impact Assessment Work Group
2. Atmospheric Modelling Work Group

3A. Strategies Development and Implementation Work Group

3B. Emissions, Costs and Engineering Assessment Subgroup

4. Legal, Institutional Arrangements and Drafting Work Group

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[129]Memorandum of Intent, *supra*, note 127.

[130]*Id.*

[131]*Id.*

The specific mandate for each group is also spelled out in some detail in the Annex.

Apart from the substantive tasks assigned to each Group, the Annex also establishes general terms of reference, which set a date for submission of work plans, interim reports and final reports by the Work Groups. A particularly revealing clause in the general terms of reference suggests a somewhat different tenor to the MOI process than is true for the Great Lakes Water Quality Agreements:

> II(1) The Work Groups shall function under the general direction and policy guidance of a Canada/United States Coordinating Committee co-chaired by the Department of External Affairs and the Department of State.

It has been suggested by one of those directly involved in negotiating the MOI that this provision, that the Work Groups report directly to the Coordinating Committee rather than to a less-politicized body such as the IJC, merely reflects that the parties were "broadly agreed on the nature of the problem but required detailed advice from experts in various fields in order to devise a reasonable response to it."[132] And certainly there is an argument that, since the MOI process is designed as a preparatory step for eventual negotiations, it is only reasonable to provide that the eventual negotiators should have some input, in order to ensure that the relevant issues are addressed in a way that will make the results most useful in reaching an agreement.

Nevertheless, one can equally suggest that the use of the IJC need not have precluded this "political" input, especially since the Canada-U.S. Committee can always refer specific matters back to Work Groups for elaboration at a later point in time as required.[133] More importantly, had the authority for coordination been entrusted to an agency such as the International Joint Commission, which has developed some reputation as possessing a measure of neutrality, the atmosphere created in the Work Groups themselves might have been more conducive to a less-politicized examination of the problem.

In fact this inherent potential for politicization seems at times to have been realized in the Work Groups, especially after the changeover in administrations in the United States in January 1981. While it was of course expected that negotiators would eventually differ on certain points, it was also assumed that the joint Work Group structure would permit the development of a shared technical understanding:

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[132]R.M. Robinson, "The Rule of Law Between Nations—An Acid Test", a paper delivered at the Seventh Symposium on Statistics and the Environment, National Academy of Sciences, Washington, D.C., October 4-5, 1982, at 20. Significantly, this speech was approved personally by Environment Minister John Roberts and by the Department of External Affairs: "U.S. suppressing acid rain data", Globe and Mail, October 6, 1982, at 3.

[133]Under the Annex to the Memorandum of Intent, II (A)(4).

> Thus, instead of arguing overy every scientific conclusion or assumption, the negotiators working from a common set of scientific conclusions, would argue about timing and cost of control. While differences would undoubtedly remain, they would at least be of a type which would permit informed political judgements to be made.[134]

In contrast to these expectations the U.S. approach to the Work Groups became the object of scathing criticism in Canada at the time:

> Perhaps to establish the mood, the incoming Reagan administration quickly decided that Group III A would not develop control scenarios despite the wording of the Memorandum of Intent. Such work would be done separately by both sides as and when they choose. III A would simply oversee the workplans of the other groups and coordinate activity as needed. Not long thereafter and despite substantial agreement among the scientists within the groups in the production of draft reports, we were also treated to the sight of non-experts re-writing the conclusions and unhappy scientists being quietly reassigned. For example we have had [by October 1982] major turnovers in the U.S. membership of one group and three U.S. chairmen in succession in another . . .
>
> This pattern of external interfernce or inadequate support of the work . . . continued . . . Our scientific experts have attended scheduled meetings and had virtually no one turn up on the United States side or had people arrive whom they had never before seen. (The meetings are usually held in the United States because of the lack of travel money on the U.S. side.) Despite the frustration of operating under such conditions, our people have occasionally succeeded in laboriously putting together a draft only to have it greatly changed by the United States officials who had not been involved in the discussions that produced it.[135]

Given this background, it is not surprising that the politicization of the process was also reflected to a degree in the final reports of the Work Groups. For example, with respect to the vital issue of target loadings, Work Group 1 concluded that:

> Based on the results of the empirical studies, interpretation of long-term water quality data, studies of sediment cores and models that have been reviewed, we conclude that acidic deposition has caused long-term and short-term acidification of sensitive (low alkalinity) surface waters in Canada and the U.S. The Work Group concludes on the basis of our understanding of the acidification process that reductions from present levels of total sulphur deposition in some areas would reduce further damage to sensitive (low alkalinity) surface waters and would lead to eventual recovery of those waters that have already been altered chemically or biologically.[136]

Nevertheless, the Work Group was divided as to whether a specific target loading rate could be recommended. As might have been expected only the Canadian members of the Group were willing to propose such a target (of 20 kg. ha. per year) as a means of protecting "all but the most

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[134]Robinson, *supra*, note 132, at 22.

[135]*Id.*, at 23 to 24.

[136]*Supra*, note 4, at 1-6.

sensitive aquatic ecosystems in Canada,"[137] with higher loadings acceptable where the potential for reduction of acidity and the surface alkalinity are relatively high. This recommendation is in striking contrast to the conclusion drawn by the U.S. members:

> The U.S. members conclude that reductions in pH, loss of alkalinity, and associated biological changes have occurred in areas receiving acidic deposition, but cause and effects relationships have often not been clearly established. The relative contributions of acidic inputs from the atmosphere, land use changes, and natural terrestrial processes are not known. The key terrestrial processes which provide acidity to the aquatic systems and/or ameliorate atmospheric acidic inputs are neither known or quantified. The key chemical and biological processes which interact in aquatic ecosystems to determine the chemical environment are not known or quantified. Based on this status of the scientific knowledge, the U.S. Work Group concludes that it is not now possible to derive quantitative loading/effects relationships.[138]

Following the publication of the Work Group reports in January 1983, an additional step not contemplated specifically in the MOI was introduced—peer evaluation of the reports by both the United States and Canada.[139] At the insistence of the former this review was conducted independently by both countries. In Canada the body designated to oversee the peer review was the Royal Society of Canada; in the United States however, rather than selecting an equivalent independent body such as the National Academy of Sciences, the task was given to the Office of Science and Technology Policy, Executive Office of the President, with the review panel appointed by the Presidential Science Advisor. Of some note is that while the Royal Society panel consisted of experts from Canada, the United States, Denmark and Sweden,[140] the U.S. panel drew only upon American scientists.

As with the Work Groups themselves, the peer evaluations reached somewhat different conclusions on the implications of existing research. While the Canadian peer review panel was by no means critical of the different Work Group reports, and while there was clear recognition of a number of deficiencies and lacunae in the existing research, its conclusions point clearly to support for the position of the Canadian government that a serious problem exists and that immediate action is warranted. The findings are worth quoting at length:

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[137] *Id.*, at I-7.

[138] *Id.*, at I-12. The conclusion has been criticized as not following from the Work Group Report's agreed text: The Royal Society of Canada, *Acid Deposition in North America, A Review of the Documents Prepared Under the Memorandum of Intent Between Canada and the United States of America, 1980, On Transboundary Air Pollution, Chairman's Appraisal*, May 1983, at I-10. It has also been suggested that this represents a volte-face from the position during the Work Group process, when there was "general acceptance" of the 20 kg./ha. per yr. loading figure: Robinson, *supra*, note 132, at 24.

[139] In fact there were reports from only three of the groups: Work Group 1, Work Group 2 and Work Group 3B. Carroll suggests that a lack of peer evaluation was one criticism of the earlier LRTAP Report: *supra*, note 115, at 242.

[140] The panel on Work Groups 1 and 2 consisted of three scientists from Canada, two from the United States and one each from Denmark and Sweden.

> **The . . . Panel agrees with the following conclusions that can be drawn from the Work Group reports:**
>
> **2. Over North America the area of most acid deposition lies over, and downwind from, the major industrial regions of the continent . . . with most acid conditions in the Ohio Valley and near Lakes Erie and Ontario. Acidity is many times greater than natural background levels (up to a hundredfold in the worst areas).**
>
> **3. The acidity is due to the presence of sulphur dioxide and nitrogen oxides, and to their conversion in the atmosphere to sulphates and nitrates. The main acidifying element in the ecosystem is sulphur, released from burning fuels and the smelting of ores. Man-made sulphur releases are 10 to 20 times greater than natural sources. These releases peaked in the mid nineteen-sixties, but are not expected to fall significantly within this century.**
>
> **4. The acid-forming gases are carried from sources to vulnerable areas by the winds. While in transit they undergo complex chemical changes, which are not yet fully understood. Over considerable distances and long periods of time (such as a year) these facts are not expected to affect the basic "linearity" of the system: that is, *to have the deposition it will be necessary to halve the emissions.***
>
> **5. *Highly significant damage to lakes and streams with low alkalinity is confirmed from Ontario, Quebec and parts of Atlantic Canada.* The deposition in rain or snow of sulphate ions (SO_4^{-2}) appears to be a key factor in such a damage . . . Over half of eastern Canada has terrain conditions in which acidification effects may be expected . . .**
>
> **6. The Canadian members of Work Group 1 recommended that a *target loading of 20 kg/ha.yr* be adopted, in order to protect all but the most sensitive waters. To do this it will be necessary to reduce sulphur emissions from the source regions. The Group does not say by how much, or by what means. The report of WG3B shows that technologies to accomplish this are available. The . . . Panel endorses these petitions, though it considers the target loading to be, if anything, on the lax side.**
>
> **9. The reports nowhere contain any account of such a strategy. Each of them stops short of what will be needed. Canadian government spokesmen have expressed this country's willingness to reduce emissions of sulphur dioxide to half the present levels. This position is not discussed in the documents. The RS Panel concludes that *a reduction in sulphur dioxide emissions is indeed the only way to stop the observed damage to lakes and streams.* All other measures are costly local palliatives. With the information available in these reports, and in subsequent papers, it should be possible to design a bilateral control strategy to achieve the reduced sulphate loadings recommended. This has not yet been done, nor were the writers of the WG reports able to agree on what needed to be done.**
>
> **11. In spite of the caution with which the reports draw conclusions, *there is no doubt that the long range transport of air pollutants calls for prompt action by the two federal governments.* This conclusion is supported by the evidence in the report, and by many studies carried out by responsible scientists on both sides of the Atlantic.[141]**
>
> **[Emphasis added]**

In contrast to this emphasis on the need for action given the present state of knowledge, the United States peer review panel was much more cautious in drawing conclusions from existing research, and much more

[141] *Acid Deposition, supra*, note 138, at I-18 to I-20.

tentative in suggesting a clear course of remedial action. While it is conceded that "there are many indicators which, taken collectively, lead us to [the] finding that the phenomena of acid disposition are real and constitute of a problem for which solutions should be sought",[142] the policy conclusions drawn from this are, to say the least, restrained:

> "Acid rain" or acid precipitation belongs to a socially very important class of problems that have the superficial aspects of being amenable to a permanent solution achieved by a straightforward sum of existing technological and legislative fixes. This is very deceptive. Rather, this class of problems is usually not permanently solved in a closed fashion, but is treated more commonly to accommodate a steady increase in knowledge and understanding, taking various actions that appear most effective and economical at any given time.
>
> We feel that the proper initial approach is to select particularly economically effective steps to begin to reduce our concerns in the light of gross transport and deposition features that have been identified, associated with seasonal and geographical variation.[143]

In the months following the release of the peer evaluations the process of resolving the acid rain problem has not advanced significantly. Even before the completion of the Work Group process, formal negotiations had begun (in the autumn of 1981), and in February 1982 Canada submitted a draft proposal calling for a 50 percent reduction in Canadian SO2 emissions, contingent upon parallel actions by the United States.[144] This proposal was rejected by the United States at a June 1982 negotiating session,[145] and no further negotiations have been held.

The appointment in the spring of 1983 of William Ruckelshaus to head the Environmental Protection Agency in the United States was greeted with guarded optimism in Canada. Ruckelshaus has since met with the new Canadian Environment Minister, Charles Caccia, on the matter,[146] and has presented a package of options to the U.S. Cabinet Committee on Natural Resources and the Environment. However, as of this writing, no decision

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[142]*General Comments on Acid Rain, A Summary by the Acid Rain Peer Review Panel for the Office of Science and Technology Policy, Executive Office of the President*, Washington, June 27, 1983, at 1.

[143]*Id.*, at 5.

[144]For an account of the formal negotiations, see Wetstone and Rosencranz, *supra*, note 1, at 128 to 129. It is of some significance for constitutional law that the offer was made with the support of provincial governments which would be affected by a roll-back. Although not the subject of this paper, provincial (as opposed to national) initiatives with respect to acid rain are interesting in their own right. Ontario and Quebec especially have taken very active roles in the debate. Quebec, for example, has entered into research agreements on acid rain (with Vermont and New York), and both Ontario and Quebec have intervened before the U.S. Environmental Protection Agency with respect to possible relaxation of SO2 standards. Provincial action with respect to acid rain is discussed in Carroll, *supra*, note 115, ch. 11, *passim*.

[145]*Id.*, at 128.

[146]In October 1983 at Halifax.

has been forthcoming on which option should be pursued.[147] As a result the formal negotiations contemplated in the Memorandum of Intent remain in limbo, with Canada's February 1982 proposal still rejected by the United States.

4.5 Bilateral Cooperation After the MOI

Over a period of nearly three-quarters of a century Canada and the United States have developed a number of successful techniques for resolving and avoiding transboundary resource conflicts. One can identify a few common themes in this history of dispute management—an emphasis on procedure rather than substance, (especially in the initial grappling with a problem), a preference for consultation and negotiation rather than formal arbitration, and a desire to depoliticize issues, either through *ad hoc* bilateral technical working groups or through the use of the International Joint Commission.

This approach has generally worked well, as evidenced by the IJC's reputation as a fair-minded, non-political (with a very few exceptions) body. Upon first examination the Memorandum of Intent would appear to fit within this tradition, with its emphasis on procedural requirements, its commitment to negotiation, and its reliance on bilateral work groups to flesh out the specifics of the problem. In fact the process has worked somewhat differently. There have been strong accusations by Canada of political interference by the United States in the work group exercise and an apparent inability by the two countries to find much common ground in negotiations. The bitterness which one detects at times in bilateral exchanges on acid rain raises the questions of, first, whether the MOI process was an appropriate mechanism to deal with this specific problem, and second, what implications the process has had for the future handling of transboundary pollution issues generally.

As to the first question, it should be noted that the MOI exercise has achieved some successes. It has established the existence of a problem, if only in general terms; it has provided a focus for synthesizing existing research on acid rain; and it has produced a commitment to negotiate. Compared to the multilateral efforts described *supra*, these achievements are not without value.

To the suggestion that a more appropriate avenue would have been a reference to the IJC, one might equally respond that the result could well have been the increased politicization of that body, with possible deleterious fall-out for a whole range of other transboundary issues. In the end it may be that, given both the highly political nature of the issue and

[147]For a discussion of the proposals allegedly being promoted by the EPA, see "Acid Rain Threatens to Corrode State Budgets," Business Week, Sept. 26, 1983. In contrast to the five major (and wide-reaching) plans proposed in Congress to reduce acidic precipitation, the EPA would concentrate on emissions in several states only, with a budget of $2 billion compared to between $15 billion and $20 billion in the plans introduced in Congress.

the performance of the present U.S. administration on environmental matters generally, Canada may not have fared as badly as might have been the case.

As to the possible implications for other transboundary issues, again the crucial factor may be the political tenor of the existing U.S. government with respect to environmental considerations, rather than the mixed experience of the MOI. If however there is a move by the U.S. to politicize transboundary environmental disputes generally, both states will be the poorer as a result.

5. Conclusions

This article has dealt primarily with two aspects of the acid rain debate; the legal norms and techniques employed to deal with the problem, and the context in which these developed. It should be clear that the response to the acid rain problem cannot be evaluated in a vacuum, but rather reflects a variation on principles and processes that have been utilized over the years in the area of transboundary pollution management generally. This is true for both the multilateral and bilateral approaches which have been considered.

The acid rain problem presents a useful example of both the flexibility and the limitations inherent in this area of the law. We have noted that in the drafting of instruments designed to address the issue, states have drawn heavily on features and techniques employed for earlier transfrontier pollution issues. For example, one can trace in both bilateral and multilateral contexts the very heavy emphasis on procedural requirements; the obligation to consult, to notify, to negotiate, and to exchange information. Such a response is not unexpected given the often-inadequate nature of the information base available, particularly for recently developing (or at least recently recognized) issues such as acid rain.

Another feature that emerges from this area of law, and which again reflects the significance of the complex scientific problems that often underlie the legal issues, is the reliance on technical/scientific working groups to flesh out the more general concerns expressed in broader agreements. Such a technique may serve two purposes: first, and most obviously, it achieves a better and more coherent perspective on the technical nature of both the problem and the remedial possibilities; and second, it depoliticizes a controversy and prevents the adoption of inflexible negotiating positions before the problem is fully understood. With respect to the second objective, the International Joint Commission has been conspicuously successful in achieving this goal when acting within its traditional mandate.

If the issue of acid rain illustrates the flexibility of bilateral and multilateral legal mechanisms and principles in coping with new problems of transboundary pollution, it also demonstrates vividly the limitations that exist in this developing area of public international law. These limitations

are essentially two-fold, both rooted in the scientific uncertainty surrounding the acid rain debate. First is the paucity of specific and accepted legal standards with respect to acid precipitation. As we have noted, those norms that have gained acceptance tend to be procedural in nature. What substantive rules exist to be broadly phrased and capable of widely-varied interpretations, depending upon one's view of whether, for example, there has in fact been any "substantial" injury to another state. The inadequacy and uncertainty of these norms of customary law has necessitated the adoption of more positive obligations in the form of multilateral and bilateral agreements.

A second but related matter is the technical problem of proving both damage and causation given the complexity of the issues involved. This factor may increase dramatically in importance dpending upon how significantly a state sees its interests as affected by the outcome. Thus, multilaterally, we have seen in the context of the ECE Convention a reluctance by polluting states to acknowledge the sufficiency of data to establish that a serious problem exists. Combined with a lack of accepted standards, this has allowed these states to both delay corrective action and to focus attention on such matters as the economic costs of remedial measures compared to allegedly uncertain benefits.

This insistence on a full scientific understanding of the problem has perhaps ironically contributed to the very politicization of the scientific/technical debate. For example, in the context of the MOI process, it is arguable that the crucial importance of the scientific evaluation to the "bargaining" positions of the United States and Canada has resulted in an undesirable tendency to divide scientific opinion along national lines. There have been accusations that in the U.S. case this division has been due at least partly to direct political intervention in the process. The politicization of the work-group mechanism does not bode well for this particular vehicle of dispute avoidance. Whether the experience of the acid rain debate can be extrapolated to suggest a trend for transfrontier pollution negotiations generally, for example in the context of the International Joint Commission, remains to be seen.

Apart from its usefulness as an illustration of the development of legal principles and mechanisms in the area of transboundary pollution, the acid rain controversy is interesting in another context; as an example of the convergence of multilateral and bilateral issues. This convergence is characteristic of an increasing number of problems related to the management of shared resources. Similarly, the dual approach taken with respect to acid rain (of working simultaneously towards a multilateral framework agreement, while at the same time accommodating bilateral negotiations to deal with more specific concerns) reflects a more general realization that, while specific problems of transboundary resource management must ultimately be negotiated by the states directly affected, there are nevertheless common themes and issues that make it desirable to work toward global or regional norms.

One might suggest that the recent United Nations Convention on the Law of the Sea, in its anticipation of separate, bilateral or regional, negotiations is another example of this type of approach. One can readily suggest a number of other issues that would be similarly amenable to this tack; for example, weather modification. Obviously, the need for broader, multilateral negotiations will vary inversely with the degree to which accepted international norms already exist in an area.

For some states there may also be more practical reasons for conducting negotiations in both bilateral and multilateral fora. For example, while the MOI would seem to have more substantively to offer Canada (if only in the recognition that a problem exists) than the ECE Convention, there have undoubtedly been some tactical advantages for Canada in participating in the ECE process. At the very least, such participation encourages a fuller recognition of the issue as one of wider concern; Canada thus is seen not merely as an isolated voice, but rather as one of a number of states pressing similar grievances.

Purely as a matter of public relations, having an alternative forum to air one's views may also have advantages if negotiations flag in the other arena. To some extent, for example, Canada has used the ECE vehicle for this purpose when bilateral negotiations with the United States have stalled. As a practical matter, greater interaction with similarly affected states may yield benefits with respect to a better understanding of the technical and scientific problems. Thus, Canada has profited greatly from the earlier work conducted with respect to acid precipitation in the Scandinavian states.

The critical question however is: How successful has Canada been to date in solving the problems of transboundary acid precipitation through the bilateral and multilateral techniques discussed? It is obviously difficult to give an unequivocal answer. One possible approach is to consider the extent to which the ECE Convention and processes and the MOI have progressed beyond rules of customary international law. Such a progression might take the form of imposing a more stringent test of liability, of developing measures to reduce existing pollution, or simply of defining, with greater clarity, specific obligations to notify, consult, negotiate and exchange information.

On the question of liability it seems clear that little progress has been made. Neither the MOI nor the ECE Convention are concerned with allocating liability for pollution or developing a test of liability. Rather, the aim seems to be one of increasing cooperation and understanding of the problem, with the ultimate goal of reducing emissions. Admittedly, both the MOI and the ECE Convention are posited on a test of liability (both acknowledge the Stockholm Declaration in their respective preambles) but neither have developed a more stringent test.

To what extent have the ECE Convention and the MOI embraced any notion of a duty to reduce emissions? In fact neither agreement has made much progress on this front. The ECE Convention mentioned the reduc-

tion and prevention of pollution but couched any resulting obligation in very cautious terms: ". . . shall endeavour to limit and as far as possible reduce . . ." The MOI is also of little assistance. True it recognizes in the preamble that acid rain is a "serious problem" and that "actual and potential damage" is a concern (and the importance of this concession should not be underestimated), but the parties are merely "convinced that the best means to protect the environment from the effects of transboundary air pollution is through the achievement of necessary reductions in pollutant loadings." Considering the weakness of this language it is highly questionable whether the MOI can be considered as imposing new standards with respect to the reduction of emissions.

Finally, we must consider the extent to which the two agreements have advanced the body of procedural law related to the problem of transfrontier pollution. We have noted that both agreements are particularly concerned to itemize the obligations to notify other states, exchange information and consult. The ECE Convention makes no reference to an obligation to negotiate further agreements or arrangements on transfrontier pollution problems, and we noted also that it was difficult to identify a clear obligation to negotiate in the applicable customary law. By contrast, the MOI requires the U.S. and Canada, through a Coordinating Committee, "to undertake preparatory discussions immediately and commence formal negotiations . . . of (*sic*) a cooperative agreement on transboundary air pollution." While an obligation to negotiate is not an obligation to conclude an agreement, the MOI represents a significant advance in customary law in this regard. In addition, both the MOI and the ECE Convention specify the other procedural obligations (especially the collection and exchange of information) with far greater particularity than could have been attained by reliance on customary law. Furthermore, the continued consultation inherent in both the ECE Executive Body meetings and the MOI negotiations augur well for future developments in both substantive and procedural law. It is fair to suggest then that the ECE Convention and the MOI constitute important multilateral and bilateral achievements in combating long-range transfrontier air pollution in general, and acid rain in particular.

APPENDIX

MEMORANDUM OF INTENT BETWEEN THE GOVERNMENT OF CANADA AND THE GOVERNMENT OF THE UNITED STATES OF AMERICA CONCERNING TRANSBOUNDARY AIR POLLUTION

The Government of Canada and the Government of the United States of America,

Share a concern about actual and potential damage resulting from transboundary air pollution, (which is the short and long range transport of air pollutants between their countries), including the already serious problem of acid rain;

Recognize this is an important and urgent bilateral problem as it involves the flow of air pollutants in both directions across the international boundary, especially the long range transport of air pollutants;

Share also a common determination to combat transboundary air pollution in keeping with their existing international rights, obligations, commitments and cooperative practices, including those set forth in the 1909 Boundary Waters Treaty, the 1972 Stockholm Declaration on the Human Environment, the 1978 Great Lakes Water Quality Agreement, and the 1979 ECE Convention on Long Range Transboundary Air Pollution;

Undertook in July 1979 to develop a bilateral cooperative agreement on air quality which would deal effectively with transboundary air pollution;

Are resolved as a matter of priority both to improve scientific understanding of the long range transport of air pollutants and its effects and to develop and implement policies, practices and technologies to combat its impact;

Are resolved to protect the environment in harmony with measures to meet energy needs and other national objectives;

Note scientific findings which indicate that continued pollutant loadings will result in extensive acidification in geologically sensitive areas during the coming years, and that increased pollutant loadings will accelerate this process;

Are concerned that environmental stress could be increased if action is not taken to reduce transboundary air pollution;

Are convinced that the best means to protect the environment from the effects of transboundary air pollution is through the achievement of necessary reductions in pollutant loadings;

Are convinced also that this common problem requires cooperative action by both countries;

Intend to increase bilateral cooperative action to deal effectively with transboundary air pollution, including acid rain.

In particular, the Government of Canada and the Government of the United States of America intend:

1. **to develop a bilateral agreement which will reflect and further the development of effective domestic control programs and other measures to combat transboundary air pollution;**
2. **to facilitate the conclusion of such an agreement as soon as possible; and,**
3. **pending conclusion of such an agreement, to take interim actions available under current authority to combat transboundary air pollution.**

The specific undertakings of both Governments at this time are outlined below.

INTERIM ACTIONS

1. Transboundary Air Pollution Agreement

Further to their Joint Statement of July 26, 1979, and subsequent bilateral discussions, both Governments shall take all necessary steps forthwith:

(a) **to establish a Canada/United States Coordinating Committee which will undertake preparatory discussions immediately and commence formal negotiations no later than June 1, 1981, of a cooperative agreement on transboundary air pollution; and**

(b) **to provide the necessary resources for the Committee to carry out its work, including the working group structure as set forth in the Annex. Members will be appointed to the work groups by each Government as soon as possible.**

2.Control Measures

To combat transboundary air pollution both Governments shall:

(a) develop domestic air pollution control policies and strategies, and as necessary and appropriate, seek legislative or other support to give effect to them;

(b) promote vigorous enforcement of existing laws and regulations as they require limitation of emissions from new, substantially modified and existing facilities in a way which is responsive to the problems of transboundary air pollution; and

(c) share information and consult on actions being taken pursuant to (a) and (b) above.

3.Notification and Consultation

Both Governments shall continue and expand their long-standing practice of advance notification and consultation on proposed actions involving a significant risk or potential risk of causing or increasing transboundary air pollution, including:

(a) proposed major industrial development or other actions which may cause significant increases in transboundary air pollution; and

(b) proposed changes of policy, regulations or practices which may significantly affect transboundary air pollution.

4.Scientific Information, Research and Development

In order to improve understanding of their common problem and to increase their capability for controlling transboundary air pollution both Governments shall:

(a) exchange information generated in research programs being undertaken in both countries on the atmospheric aspects of the transport of air pollutants and on their effects on aquatic and terrestrial ecosystems and on human health and property;

(b) maintain and further develop a coordinated program for monitoring and evaluation of the impacts of transboundary air pollution, including the maintenance of a Canada/United States sampling network and exchange of data on current and projected emissions of major air pollutants; and

(c) continue to exchange information on research to develop improved technologies for reducing emissions of major air pollutants of concern.

The Memorandum of Intent will become effective on signature and will remain in effect until revised by mutual agreement.

DONE in duplicate at Washington, this fifth day of August, 1980, in the English and French languages, both texts being equally authoritative.

FOR THE GOVERNMENT OF CANADA:

FOR THE GOVERNMENT OF THE UNITED STATES OF AMERICA:

ANNEX
WORK GROUP STRUCTURE
FOR
NEGOTIATION OF A
TRANSBOUNDARY AIR POLLUTION AGREEMENT

I. PURPOSE

To establish technical and scientific work groups to assist in preparations for and the conduct of negotiations on a bilateral transboundary air pollution agreement. These groups shall include:

1. Impact Assessment Work Group
2. Atmospheric Modelling Work Group

3A. Strategies Development and Implementation Work Group

3B. Emissions, Costs and Engineering Assessment Subgroup

4. Legal, Institutional Arrangements and Drafting Work Group

II. TERMS OF REFERENCE

A. General

1. The Work Groups shall function under the general direction and policy guidance of a Canada/United States Coordinating Committee co-chaired by the Department of External Affairs and the Department of State.

2. The Work Groups shall provide reports assembling and analyzing information and identifying measures as outlined in Part B below, which will provide the basis of proposals for inclusion in a transboundary air pollution agreement. These reports shall be provided by January 1982 and shall be based on available information.

3. Within one month of the establishment of the Work Groups, they shall submit to the Canada/United States Coordinating Committee a work plan to accomplish the specific tasks outlined in Part B, below. Additionally, each Work Group shall submit an interim report by January 15, 1981.

4. During the course of negotiations and under the general direction and policy guidance of the Coordinating Committee, the Work Groups shall assist the Coordinating Committee as required.

5. Nothing in the foregoing shall preclude subsequent alteration of the tasks of the Work Groups or the establishment of additional Work Groups as may be agreed upon by the Governments.

B. Specific

The specific tasks of the Work Groups are set forth below.

1. Impact Assessment Work Group

The Group will provide information on the current and projected impact of air pollutants on sensitive receptor areas, and prepare proposals for the "Research, Modelling and Monitoring" element of an agreement.

In carrying out this work, the Group will:

— identify and assess physical and biological consequences possibly related to transboundary air pollution;

— determine the present status of physical and biological indicators which characterize the ecological stability of each sensitive area identified;

— review available data bases to establish more accurately historic adverse environmental impacts;

— determine the current adverse environmental impact within identified sensitive areas—annual, seasonal and episodic;

— determine the release of residues potentially related to transboundary air pollution, including possible episodic release from snowpack melt in sensitive areas;

— assess the years remaining before significant ecological changes are sustained within identified sensitive areas;

— propose reductions in the air pollutant deposition rates—annual, seasonal and episodic—which would be necessary to protect identified sensitive areas; and

— prepare proposals for the "Research, Modelling and Monitoring" element of an agreement.

2.Atmospheric Modelling Work Group

The Group will provide information based on cooperative atmospheric modelling activities leading to an understanding of the transport of air pollutants between source regions and sensitive areas, and prepare proposals for the "Research, Modelling and Monitoring" element of an agreement. As a first priority the Group will by October 1, 1980 provide initial guidance on suitable atmospheric transport models to be used in preliminary assessment activities.

In carrying out its work, the Group will:

— identify source regions and applicable emission data bases;

— evaluate and select atmospheric transport models and data bases to be used;

— relate emissions from the source regions to loadings in each identified sensitive area;

— calculate emission reductions required from source regions to achieve proposed reductions in air pollutant concentration and deposition rates which would be necessary in order to protect sensitive areas;

— assess historic trends of emissions, ambient concentrations and atmospheric deposition trends to gain further insights into source receptor relationships for air quality, including deposition; and

— prepare proposals for the "Research, Modelling and Monitoring" element of an agreement.

3A.Strategies Development and Implementation Work Group

The Group will identify, assess and propose options for the "Control" element of an agreement. Subject to the overall direction of the Coordinating Committee, it will be responsible also for coordination of the activities of Work Groups I and II. It will have one subgroup.

In carrying out its work, the Group will:

— prepare various strategy packages for the Coordinating Committee designed to achieve proposes emission reductions;

— coordinate with other Work Groups to increase the effectiveness of these packages;

— identify monitoring requirements for the implementation of any tentatively agreed-upon emission-reduction strategy for each country;

— propose additional means to further coordinate the air quality programs of the two countries; and

— prepare proposals relating to the actions each Government would need to take to implement the various strategy options.

3B.Emissions, Costs and Engineering Assessment Subgroup

This Subgroup will provide support to the development of the "Control" element of an agreement. It will also prepare proposals for the "Applied Research and Development" element of an agreement.

In carrying out its work, the Subgroup will:

— identify control technologies, which are available presently or in the near future, and their associated costs;

— review available data bases in order to establish improved historical emission trends for defined source regions;

— determine current emission rates from defined source regions;

— project future emission rates from defined source regions for most probable economic growth and pollution control conditions;

— project future emission rates resulting from the implementation of proposed strategy packages, and associated costs of implementing the proposed strategy packages; and

— prepare proposals for the "Applied Research and Development" element of an agreement.

4. **Legal, Institutional and Drafting Work Group**

The Group will:

— develop the legal elements of an agreement such as notification and consultation, equal access, non-discrimination, liability and compensation;

— propose institutional arrangements needed to give effect to an agreement and monitor its implementation; and

— review proposals of the Work Groups and refine language of draft provisions of an agreement.