ARTICLES

TRANSBOUNDARY AIR POLLUTION BETWEEN CANADA AND THE UNITED STATES

Gregory Wetstone*
and
Armin Rosencranz**

Large areas of North America are or soon may be seriously affected by acid deposition.[1] Oxides of sulfur and nitrogen produced by fossil-fuel power plants, smelting operations, and motor vehicles are carried hundreds or even thousands of miles through the atmosphere and are eventually returned to earth as dry acid-forming particles or as sulfuric and nitric acids in rain or snow. The accumulation of these acids in sensitive lakes and streams can cause dramatic impacts, including the complete elimination of fish populations and other forms of aquatic life.[2] Recent studies suggest that long-term, potentially irreversible changes may be occur-

* Gregory Wetstone (B.S., University of Florida, 1974; J.D., Duke University, 1977) is director of the Air and Water Program at the Environmental Law Institute, Washington, D.C. He is a member of the Joint Scientific Committee on Acid Precipitaton of the U.S. National Academy of Sciences and the Royal Society of Canada.

** Armin Rosencranz (A.B., Princeton University, 1958; J.D., Ph.D., Stanford University, 1962, 1970) is director of the Pioneer Fund in Inverness, California. He formerly directed the German Marshall Fund Study of Transboundary Air Pollution at the Environmental Law Institute, Washington, D.C.

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1. The term "acid deposition" refers to all forms of acid precipitation (including rain, snow, mist, fog, dew, and frost) as well as the dry deposition of sulfur and nitrogen compounds (sulfur dioxide, nitrogen oxides, and sulfate and nitrate particles) which form acids when they contact surface water.

2. Overrein, Seip & Tollan, *Acid Precipitation—Effects on Forest and Fish*, *in* FINAL REPORT OF THE SNSF PROJECT 1972-1980, at 43-51 (1980).

ring in the soils and forests of North America.[3] Crops, visibility, drinking water, and even human health may also suffer from acid deposition.[4]

Many of the lakes and streams of eastern Canada, New England, Minnesota, Wisconsin, Michigan, the southeastern region of the United States, and the Appalachian, Sierra Nevada, and Rocky Mountains share the acid sensitivity that characterizes areas low in acid neutralizing capacity.[5] Once the cumulative loading of acids deposited in these areas through the years has exhausted the environment's limited acid neutralizing capacity, severe effects can follow quickly with the addition of small quantities of acid deposition. Such effects are already apparent in many of the acid-sensitive areas located downwind from major industrial centers. At least 200 of the high altitude lakes of New York's Adirondack Mountains, once a prime sport-fishing area, have been so acidified that fish populations have been eliminated.[6] In addition, fish have disappeared from nearly 140 of Ontario's lakes, mainly in the Killarney (Wilderness) Park near the International Nickel Company (INCO) smelter at Sudbury.[7] Lakes in Ontario's popular Muskoka-Haliburton region and the U.S. Southeast are also endangered; many have already lost much of their ability to neutralize acids.[8]

The potential for future damage is especially great in Canada. Nearly all of the many lake areas in eastern Ontario, Quebec, and the Atlantic provinces are especially vulnerable to

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3. Bormann, *The New England Landscape: Air Pollution Stress and Energy Policy*, 11 AMBIO 188 (1982); G. Tomlinson, Die-Back of Red Spruce, Acid Deposition, and Changes in Soil Nutrient States—A Review, Domtar Inc., Montreal, Quebec (May, 1982). Vogelmann, *Catastrophe on Camel's Hump*, NAT. HIST., at 8 (Nov. 1982). *Acid Rain: A Technical Inquiry: Hearings Before the Senate Comm. on Environment and Public Works*, 97th Cong., 2d Sess. (May 27, 1982) (statement of Arthur H. Johnson).

4. U.S.-CANADA MEMORANDUM OF INTENT ON TRANSBOUNDARY AIR POLLUTION, IMPACT ASSESSMENT, INTERIM REPORT (Feb. 1981); Likens, Wright, Galloway & Butler, *Acid Rain*, SCI. AM., 43 (Oct. 1979).

5. NATIONAL RESEARCH COUNCIL OF CANADA, ACIDIFICATION IN THE CANADIAN AQUATIC ENVIRONMENT: SCIENTIFIC CRITERIA FOR ASSESSING THE EFFECTS OF ACIDIC DEPOSITION ON AQUATIC ECOSYSTEMS § 3.5 (1981); J. OMERNIK & C. POWERS, TOTAL ALKALINITY OF SURFACE WATERS—A NATIONAL MAP, U.S. ENVIRONMENTAL PROTECTION AGENCY (1982) (Corvallis Environmental Research Laboratory).

6. Harvey, *Widespread and Diverse Changes in the Biota of North American Lakes and Rivers Coincident with Acidification*, *in* ECOLOGICAL IMPACT OF ACID PRECIPITATION (Drablos & Tollan ed. 1980) [hereinafter cited as ECOLOGICAL IMPACT].

7. ONTARIO MINISTRY OF THE ENVIRONMENT, ACID PRECIPITATION IN ONTARIO (1979).

8. Dillon, Jeffries, Scheider & Yan, *Some Aspects of Acidification in Southern Ontario*, *in* ECOLOGICAL IMPACT, *supra* note 6, at 212; Crisman, Schulze, Brezonik & Bloom, *Acid Precipitation: The Biotic Response in Florida Lakes*, *in* ECOLOGICAL IMPACT, *supra* note 6, at 296.

acidity.[9] In Ontario alone, 48,000 lakes are reportedly threatened by acidification in the next twenty years if emission rates remain unchanged.[10] Hundreds of sensitive aquatic ecosystems in Minnesota, Wisconsin, and Michigan are in danger of becoming acidified with the continued deposition of acids.[11] In addition, a recent study for the U.S. Congressional Office of Technology Assessment concluded that the lakes and streams in over 116,000 square miles of the Northeast are at risk.[12]

The United States currently produces about twenty-four million tons of sulfur dioxide (SO_2) pollution annually, an amount which exceeds that produced in northwestern Europe and Canada combined.[13] Yearly emissions of nitrogen oxides (NO_x) have tripled over the past forty years to reach the current level of nineteen million tons and are projected to increase still further.[14] Canada, in contrast, releases about one-fifth as much SO_2 and one-tenth as much NO_x as the United States.[15] Nevertheless, there are some extremely large pollution sources in Canada, most notably the coal-fired Nanticoke power plant on Lake Erie and the INCO smelter at Sudbury.[16]

This pollution flows freely with the winds over North America, regularly crossing the boundary between the United States and Canada. Recent studies suggest that about two-thirds of the sulfur deposition in eastern Canada originates with emissions in the United States. Canadian sources, on the other hand, are responsible for about one-third of the sulfur deposition in the acid-sensitive U.S. Northeast.[17]

Any significant emissions cutback will be expensive. A 1978 report to the International Joint Commission (IJC) estimated that a fifty percent reduction in SO_2 emissions from eastern Canada would cost about $350 million per year, while a similar decrease

9. Shaw, *Acid Precipitation in Atlantic Canada*, 13 ENVTL. SCI. & TECHN. 406 (1979).

10. Statement of Canadian Environment Minister John Fraser, after meeting with U.S. Secretary of the Interior Cecil Andrus (Aug. 8, 1979).

11. Glass, *Susceptibility of Aquatic and Terrestrial Resources of Minnesota, Wisconsin and Michigan to Impacts From Acid Precipitation: Informational Requirements*, in ECOLOGICAL IMPACT, *supra* note 6, at 112.

12. O. LOUCKS, R. MILLER & T. ARMENTARO, REGIONAL ASSESSMENT OF AQUATIC RESOURCES AT RISK FROM ACIDIC DEPOSITION 16 (1982).

13. U.S.-CANADA MEMORANDUM OF INTENT ON TRANSBOUNDARY AIR POLLUTION, EMISSIONS, COSTS AND ENGINEERING ASSESSMENT, FINAL REPORT at 7 (June 15, 1982).

14. *Id.* at 8, 32.

15. *Id.* at 7-10.

16. *Id.* at 9.

17. U.S.-CANADA MEMORANDUM OF INTENT ON TRANSBOUNDARY AIR POLLUTION, ATMOSPHERIC MODELLING, INTERIM REPORT at A8-15 (Feb. 1981).

in the eastern United States might cost $5 to $7 billion annually.[18] Costs of this magnitude can be seen in perspective only when compared to the damages associated with failure to take abatement action. Without abatement, the acidity of rain and snowfall in eastern North America will very likely increase, bringing serious adverse environmental and possible health effects. Direct economic losses could include an appreciable reduction in the productivity of agricultural and forest lands,[19] loss of the tourist and fishing industries in acidified areas, and corrosion damage to building materials. Environmental effects, which are harder to quantify, could include the permanent loss of fish and other aquatic life forms in thousands of North American lakes, the loss of some wildlife dependent on aquatic life, and possibly irreversible changes in soils and forests. Although there is no conclusive proof of adverse health effects resulting from acid rain, certain toxic metals chemically mobilized in drinking water, such as aluminum, mercury, and lead, pose clear risks to human health, as do respirable sulfate particles.[20]

Present approaches to air pollution control in both Canada and the United States represent difficult compromises between economic concerns and the need for environmental protection. The revelation that familiar local pollutants are transported great distances and deposited as environmentally damaging acids may signal the need to redraw this delicate balance between environmental and economic considerations.

Ontario's decision to tighten emissions controls at the giant INCO smelter at Sudbury represents both an attempt to come to grips with the potentially serious threat to Ontario's environment and an effort to exert pressure on the United States to reduce the transboundary flow of such pollutants.[21] But the United States is apparently not yet prepared to alter its policies to reduce acid rain, either for its own sake or for the sake of its northern neighbor.

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18. Great Lakes Water Quality Board, 1978 Annual Report to the IJC 83 (July 1979) (for an explanation of the goals of the IJC, see *infra* text accompanying note 101). John Roberts, Canada's Environment Minister, estimates the annual costs to Canada at $1 billion by 1990. He also estimates the annual cost to the United States at $3 to $4 billion by 1990 to reduce by 50% all emissions from power plants east of the Mississippi. Such a program, according to Roberts, would require an average annual increase in utility rates of about two percent. *See* Speech of the Honourable John Roberts at the Commonwealth Club of California, October 22, 1982, at 1 (available from Environment Canada).

19. *See* Speech of the Honorable John Roberts, *supra* note 18, at 5, 6. Forestry is Canada's largest industry by far. Serious damage to forests has also been reported in West Germany. *See* Statement of Gerhart Baum, Minister of the Interior, Federal Republic of Germany, at the 1982 Stockholm Conference on Acidification of the Environment, at 3 (June 28, 1982).

20. *See* Likens, Wright, Galloway & Butler, *Acid Rain*, SCI. AM. 43 (Oct. 1979).

21. *See infra* note 52.

In this article we first examine the responses of the United States and Canada to the acid rain problem, looking closely at the provisions of each country's Clean Air Act that specifically address transboundary pollution. We next explore the efficacy of international law, institutions, and agreements in attempting to abate transboundary air pollution. We then briefly examine the settlement of transboundary pollution controversies in domestic courts. Finally, we discuss in some detail the progress that both countries have made toward achieving a bilateral air quality agreement.

I. THE UNITED STATES' RESPONSE

A. Changes in Government Change Pollution Control Priorities

Under the Carter Administration, the federal government took several actions indicating that it viewed long-range air pollution as an extremely serious national and international environmental problem. In 1979, the Environmental Protection Agency (EPA) published a special report characterizing in detail the extent and potential severity of the effects of acid deposition.[22] The same year President Carter identified acid rain as one of the two most serious environmental problems associated with the continued use of fossil fuels[23] and accordingly inaugurated a ten-year federal acid rain assessment program which was later given congressional sanction.[24] The Carter Administration also initiated cooperative research efforts with Canada and laid the foundation for the negotiation of an agreement to better control transboundary air pollution.[25]

The Reagan Administration has been much more subdued in

22. U.S. ENVIRONMENTAL PROTECTION AGENCY, ACID RAIN RESEARCH SUMMARY, EPA-600-18-79-028, October, 1979.

23. President's Message to Congress on Environmental Priorities and Programs, 15 WEEKLY COMP. OF PRES. DOC. 1353, (August 2, 1979), *reprinted in* 9 ENVTL. L. REP. 50017 (1979). The other problem identified by President Carter was world forest loss.

24. The Interagency Acid Rain Coordinating Committee was established by President Carter in August, 1979. In June, 1980 the Acid Precipitation Act of 1980, 42 U.S.C. §§ 8901-8905, was signed into law. This Act gave Congressional sanction and funding to a slightly altered research effort. A draft report was released in January 1981. Interagency Task Force on Acid Precipitation, National Acid Precipitation Assessment Plan, Draft, January, 1981.

25. Joint Statement on Transboundary Air Quality by the Government of Canada and the Government of the United States of America, July 26, 1979 (available from the U.S. Department of State, Bureau of Oceans, Environment and Science); and Memorandum of Intent Between the Government of Canada and the Government of the United States of America Concerning Transboundary Air Pollution, Aug. 5, 1980 (available from U.S. Dep't of State and Canadian Dep't of External Affairs), *reprinted in* INT'L ENV'T REP. at 391-93 (Aug. 13, 1980).

its expression of concern over transboundary air pollution. Under Administrator Anne Burford, the EPA did not pursue the effort begun under her predecessor, Douglas Costle, to address the acid deposition problem through the international air pollution section of the Clean Air Act.[26] The agency has also adopted policies which vitiate the Act's potential for more stringent control of pollutants transported between states.[27] The Reagan Administration contends that while long-range air pollution in general and acid deposition in particular may present serious problems, too many scientific aspects of the problems are inadequately understood. It argues that more information must be compiled before abatement action is undertaken.[28]

The Reagan Administration's policy on the control of long-range transboundary air pollution is a major factor in the debate surrounding the reauthorization of the U.S. Clean Air Act. Any significant loosening of the Act's requirements, in particular any step that would lead to relaxations in sulfur dioxide and nitrogen dioxide control requirements, would exacerbate both domestic and transboundary acid deposition problems. The Administration's initial statements on the subject indicate that it views clean air regulation as a key target for "regulatory relief" in the move to

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26. Clean Air Act, 42 U.S.C. § 7415 (Supp. IV 1980).

27. "The U.S. has honored the intent of the MOI by controlling its SO_2 emissions to the extent allowed by the provisions of domestic law. In this rulemaking EPA has concluded that the current emission limits are adequate to protect and maintain the NAAQS. Therefore it has met its obligations under the MOI to enforce domestic law." 46 Fed. Reg. 37,642, 37,645-46 (1981). This proceeding concerned air pollution control relaxations for two Ohio power plants. Ontario intervened, maintaining the EPA was obliged to consider the international impacts of the action. Province of Ontario, A Submission to the United States Environmental Protection Agency Opposing Relaxation of SO_2 Emission Limits in State Implementation Plans and Urging Enforcement (Mar. 12, 1981, expanded Mar. 27, 1981).

28. *Bennett, EPA Air Program Nominee, calls Controls for Acid Rain Premature*, ENV'T REP (BNA) at 411 (July 24, 1981); and Cohn, *EPA Chief Says Clean Air Laws Have Hurt Economy*, Philadelphia Inquirer, June 23, 1981. *See also Reagan Administration Drafts, Redrafts Specific Clean Air Act Amendments*, AIR AND WATER POLLUTION REP., August 31, 1981.

The Reagan Administration's skepticism about acid rain's effects is reflected in a February 3, 1982 report from Alvin Trivelpiece, Director, Office of Energy Research, U.S. Department of Energy, to Richard Funkhouser, Director, Office of International Activities, U.S. Environmental Protection Agency, commenting on "OECD Paper on Acid Rain":

> [Paragraph B.3] [a]sserts without basis that a significant amount of damage occurs in Canada when in fact damages have not been reliably quantified either in the referenced document or elsewhere.
> [Paragraph B.3] [a]sserts without basis that damages in Canada stem from emissions in other countries when in fact the connection to foreign emissions has not been established quantitatively . . . .

Reprinted in Review of the Global Environment 10 years after Stockholm: Hearings before the Subcomm. on Human Rights and International Organizations of the House Comm. on Foreign Affairs, 97th Cong., 2d Sess. 469, 471 (1982).

ease the burdens imposed on industry by the federal government.[29]

The Reagan Administration's view that current scientific evidence does not warrant new programs to control transboundary air pollution is shared by several business and governmental interests. The companies that mine and supply high-sulfur coals, the electric utilities that burn large quantities of high-sulfur coal, and the midwestern states that emit large volumes of sulfur dioxide all see themselves, with some cause, as likely targets in any new program to address long range transboundary air pollution.[30] These parties adamantly oppose new air pollution control requirements designed to reduce acid deposition in distant areas.[31] In the view of William Poundstone, executive vice president of Consolidation Coal Company, controls would be premature:

> We are highly suspicious that the acidity of precipitation is not worsening rapidly, as has been alleged; we further suspect that a multitude of local sources will be found to be the major cause of acid precipitation, rather than long range transport of emissions from large coal-fired power plants hundreds of miles away. Reason demands that we take the necessary time to find clear answers to the central questions which have been raised about acid rain before staggering control costs—which may not even solve the problem—are imposed on our inflationary economy.[32]

The prevailing viewpoint in the northeastern "victim" states and the U.S. environmental community holds that enough is

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29. Pasztor, *Attempts to Soften Basic Clean Air Laws may Bring Major Struggle, Some Changes*, Wall St. J., May 8, 1981, at 52; Omang, *Clean Air Act May Be Facing Drastic Overhaul*, Washington Post, May 26, 1981, at A1.

30. Most of the regulatory options which have been studied to date focus on these sources. Teknekron Research Inc., Interim Report Phase I: Acid Rain Mitigation Study, Selected Results for FGD Retrofit Strategies and Historical Operating Characteristics, R-008-EPA-80 (July 1980). G. Wetstone and P. Reed, Institutional Aspects of Transported Air Pollutants: an Examination of Strategies for Addressing Long Range Air Pollution Problems (Feb. 1980) (prepared for the National Commission on Air Quality).

31. M. Smith, J. Martin & M. Kramer, Review of Ohio River Basin Energy Study (ORBES) (Jan. 30, 1981) (prepared for utility Air Regulatory Group). Edison Electric Institute, National Rural Electric Cooperative Association and Utility Air Regulatory Group, Acid Precipitation: The Issue in Prespective (June 26, 1980); C. Runyon, The Acid Rain Controversy: An Overview, Environmental Affairs Division, Ohio Edison Company (Sept. 10, 1980); The Transnational Implication of Acid Rain: An Industrial Perspective, Remarks by B. Beach, Vice President, Environmental Affairs, Consolidation Coal Company at Acid Rain Conference of Canada-U.S. Law Institute, Cleveland, Ohio (Mar. 28, 1981); and addresses by W. Poundstone, Executive Vice President, Consolidation Coal Co., and J. Dowd, Senior Vice President, American Electric Power at Conference on Acid Rain, State University of New York at Buffalo (May 1, 1981).

32. W. Poundstone, Is Acid Rain a Non-Problem? Address at Energy Department Conference on Acid Rain, at 18 (Dec. 1980) (Arlington, Virginia).

known about the causes and damaging effects of acid deposition to warrant an immediate program to reduce emissions of sulfur dioxide. In its Clean Air Act position paper, the National Clean Air Coalition explained:

> Scientists who have devoted their careers to the study of acid rain have reached consensus that we know enough now to identify a virtually foolproof first step in reducing acid rain—reduction of sulfur oxide emissions. The longer we wait to take the step, the greater the damage to our environment will be.
>
> While research should continue, no other plausible cause of acid rain exists except man-made emissions of sulfur and nitrogen oxides, and no other plausible cure exists except substantially reducing those emissions over broad areas of the country.[33]

A recent National Academy of Sciences report on the ecological consequences of fossil fuel combustion similarly concluded:

> Although claims have been made that direct evidence linking power-plant emissions to the production of acid rain is inconclusive . . . , we find the circumstantial evidence for their role overwhelming.[34]
>
> Though necessarily incomplete in many respects, the information synthesized by the Committee renders a rather unfavorable picture of the consequences of current fossil fuel burning practices. . . . It is the Committee's opinion, based on the evidence we have examined, that the picture is disturbing enough to merit prompt tightening of restrictions on atmospheric emissions from fossil fuels and other large sources such as metal smelters and cement manufacture. Strong measures are necessary if we are to prevent further degradation of natural ecosystems, which together support life on this planet.[35]

B. International Pollution Control Under the U.S. Clean Air Act

The U.S. Clean Air Act expressly recognizes the need for new pollution abatement programs where necessary to redress international air pollution problems. Section 115[36] establishes a procedure whereby the EPA Administrator may require states to revise

33. National Clean Air Coalition, Positions on the Clean Air Act, at 25, 26 (Apr. 1981).

34. Committee on the Atmosphere and the Biosphere, National Reserach Council, Atmosphere-Biosphere Interactions: Toward a Better Understanding of the Ecological Consequences of Fossil Fuel Combustion, at 3 (1981) (National Academy of Sciences).

35. *Id.* at 7.

36. 42 U.S.C. § 7415 (Supp. IV 1980). For a comprehensive discussion of § 115 and its application to U.S.-Canadian air pollution problems prior to the addition of § 21.1 to the Canadian Clean Air Act, *see* R. Stein and B. Fleming, The Use of Section 115 of the Clean Air Act to Control Long Range Transport of Air Pollution Between the United States and Canada, Environmental Mediation International, Inc.

their air quality plans to eliminate emissions that cause or contribute to air pollution which represents a danger to public health or welfare in a foreign country. This provision, however, has never been successfully used to establish new control requirements in response to transboundary pollution problems.

Three steps are required before section 115 control requirements may be imposed. First, the EPA Administrator or the Secretary of State must determine that pollution from the United States causes or contributes to an air pollution problem "which may reasonably be anticipated to endanger public health or welfare in a foreign country."[37] Second, the EPA Administrator must determine that the affected foreign country gives the United States "essentially the same rights with respect to the prevention or control of air pollution occurring in that country as is given that country by this section."[38] Third, upon a positive determination with respect to the first two conditions, the Administrator is directed to give formal notification to the governors of the states in which the emissions contributing to the international air pollution problem originate.[39] This notice constitutes a finding that a state's air quality implementation plan must be revised to prevent or eliminate the endangerment to public health or welfare in the foreign nation.[40]

The Act's international provision has several debilitating weaknesses. It establishes no method for identifying the states whose emissions materially contribute to an international air pollution problem, that is, whose emissions warrant the formal notice initiating the state revision process. The Act merely offers the general test of whether a state's emissions "cause or contribute to" an air pollution problem in a foreign country. Moreover, the EPA has failed to develop regulations providing procedural or substantive rules to implement section 115. Given the great cost of abatement procedures, as well as the scientific uncertainty which surrounds long-range air pollution in general and acid deposition

(Jan. 1981) (prepared for Environment Canada and U.S. Environmental Protection Agency).

37. 42 U.S.C. § 7415(a) (Supp. IV 1980). The Administrator can bring § 115 into play whenever he or she has "reason to believe," upon receipt of "reports, surveys or studies from any duly constituted international agency," that such an international pollution problem exists. *Id.* The process may also be begun at the request of the Secretary of State with respect to pollution which he or she "alleges is of such a nature." *Id.*

38. *Id.* § 7415(c).

39. *Id.* § 7415(a).

40. Upon notification to the governor by the EPA Administrator that the state plan is in violation of the Clean Air Act, 42 U.S.C. §§ 7410(a)(2)(H), 7415(a), the state must not only revise its air pollution control plan but also provide for future revisions of that plan made necessary by changes in the national primary and secondary ambient air quality standards.

in particular, it will be difficult politically to apply section 115 to specific states.

To date, no state has altered its air pollution control plan in response to international air pollution concerns raised through the Clean Air Act. There has been substantial preliminary maneuvering directed toward the possible use of section 115 in response to the acid deposition problem in eastern Canada, but no action appears imminent.

Between 1977 and 1981, reports of the International Joint Commission (IJC) and the U.S.-Canada Research Consultation Group arguably provided sufficent information on transboundary air pollution to precipitate consideration of a section 115 action.[41] However, it was not until December 1980, when the Canadian Parliament enacted Canadian Clean Air Act section 21.2,[42] which the Parliament intended specifically to assure reciprocity, that the EPA took steps toward initiating action under section 115.

As EPA Administrator Douglas Costle left office in January of 1981, it appeared that section 115 might be brought into play. The Administrator had made a determination that an international air pollution problem of the type described in section 115(a) existed between the United States and Canada. He had also found that the Canadian parliamentary action on international air pollution created the necessary reciprocity. Although an ongoing review of the interpretation and implementation of the Canadian legislation would be necessary, Costle deemed it appropriate to initiate the formal process of a section 115-based revision of state air quality plans through the notification of appropriate states. David Hawkins, then Assistant EPA Administrator for Air, Noise, and Radiation, sent a memorandum to the Agency's Office of Air Quality Planning and Standards (OAQPS) requesting that the OAQPS staff "proceed to develop information and recommendations for the next Administrator as to which states might appropriately be notified (under section 115)."[43]

In the two years since these actions were taken, the EPA, under Administrator Anne Burford, neither continued the process initiated by Costle nor formally stated a new agency position on the applicability of section 115. There has been no ongoing effort at the Office of Air Quality Planning and Standards to identify

41. UNITED STATES-CANADA RESEARCH CONSULTATION GROUP, THE LONG-RANGE TRANSPORT OF AIR POLLUTANTS PROBLEM IN NORTH AMERICA: A PRELIMINARY OVERVIEW (1979).

42. Clean Air Act, CAN. STAT. ch. 45, § 21.2 (1980).

43. Memorandum from David Hawkins, EPA Assistant Administrator for Air, Noise and Radiation, to Walter Barber, EPA Office of Air Quality Planning and Standards (January 13, 1981).

"appropriate" states for notification under section 115.[44] The Agency has, however, made it clear that since Costle's January 1981 actions did not include an actual notification of states, the formal action which triggers state air quality plan revisions, he took no "final action" and his conclusions regarding the use of section 115 are not binding.[45]

II. THE CANADIAN RESPONSE

A. The Emergence of a Canadian Consensus

Canada is a geographically large nation with comparatively limited areas of industrial development. It releases into the atmosphere about one-fifth as much SO_2 and one-tenth as much NO_x as the United States.[46] Environment Canada[47] estimates that half of the acid rain falling on Canada originates in the United States.[48] There are, however, some extremely large Canadian sources that contribute significantly to deposition of acids in Canada and in parts of the United States as well. Most notable are the Nanticoke coal-fired power plant on Lake Erie, the largest coal-fired power plant in the free world, and INCO's Sudbury smelter, the largest source of SO_2 pollution in the world. Nonferrous smelting currently accounts for about fifty percent of Canada's sulfur emissions.[49] This emission picture could change, however, as government policy makers respond to growing public concern over acid rain.

Until recently, the desire to encourage greater development

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44. In response to a request under the Freedom of Information Act, EPA explained that there were no records regarding any staff response to Hawkins' memo to the Office of Air Quality Planning and Standards. Letter from Dennis Turpak, EPA Director, Office of Exploratory Research to Robert Blacher, attorney for the Province of Ontario, August 4, 1981.

45. EPA has taken this position in ongoing litigation concerning the legal significance of former Administrator Costle's section 115 activities. Ohio v. EPA, No. 81-1310, D.C. Circuit, filed March 17, 1981. (The Ontario Ministry of the Environment has intervened in this proceeding). An internal EPA memorandum released under a Freedom of Information Act request also conveys this view. Memorandum from Lydia Wegman, EPA attorney, Air, Noise and Radiation Division to Alice Popkin, EPA Director, Office of International Activities, (October 18, 1981).

46. U.S.-CANADA MEMORANDUM OF INTENT ON TRANSBOUNDARY AIR POLLUTION, EMISSIONS, COSTS AND ENGINEERING ASSESSMENT, INTERIM REPORT, at 14 (February 1981).

47. Environment Canada is the Canadian federal agency charged with protection of the environment.

48. Dr. Douglas Whelpdale of Environment Canada's Atmospheric Environment Service, *cited in* ENVIRONMENT CANADA, THE ACID RAIN STORY (1981). Environment Minister John Roberts has stated that 'in the tourist and recreation areas of south-central Ontario . . . as much as 75% of the acid rain comes out of stacks in the Ohio Valley." *See* Speech of the Honorable John Roberts at the Commonwealth Club of California at 9 (October 22, 1982) (available from Environment Canada).

49. EMISSIONS, COSTS AND ENGINEERING ASSSESSMENT, *surpa* note 46, at 13.

of Canada's industrial potential, together with the public perception of the nation's environment as largely pristine, worked against the establishment of stringent air pollution control requirements.[50] Recent awareness of the acid rain problem, however, has dramatically altered perceptions of the vulnerability of Canada's environment.[51] A number of new sulfur oxide control programs are now being planned or are in the early stages of implementation in Canada.[52]

The acid deposition and transboundary air pollution phenomena are viewed very somberly in Canada. Environment Minister John Roberts has declared that acid rain is "the most serious environmental threat ever to face the North American Continent."[53] This view of the problem is widely shared in eastern Canada. Even officials of the smelting industry, major sulfur dioxide emitters not normally attuned to environmental concerns, have come to share this view. C.F. Baird, INCO chairman, observed, "We are aware of the seriousness of the acid rain problem and the need to do our part to help solve it."[54]

The consensus that action is needed without delay has been manifested through a number of government actions. The Canadian Clean Air Act was amended in December 1980 to add a provision improving the federal government's ability to control transboundary air pollution originating in Canada.[55] The amendment was passed unanimously, an extremely rare event in Ca-

50. For one view of the climate for environmental regulation in Canada, *see* Carroll, *Differences in the Environmental Regulatory Climate of Canada and the United States*, in CAN. WATER RESOURCES J., (Fall, 1979).

51. *Acid Rain: Who Will Save Our Lakes*? McLean's, June 30, 1980; Zimmerman, *Canada Sees Acid Rain Kill Life in Lakes*, Cleveland Plain Dealer, August 3, 1981, at 1A; and *Acid Rain, An Interview with Dr. J. Stuart Warner, Vice President, Inco Limited*, Inco Triangle, Nov.-Dec., 1979.

According to Environment Minister John Roberts, only one Canadian in twenty is unaware of the threat of acid rain, and a staggering 77 percent view acid rain as Canada's most serious and pressing environmental problem. *Solving the Acid Rain Equation*, 32 J. AIR POLLUTION CONTROL ASS'N 925 (1982) (address by the Honourable John Roberts to the Air Pollution Control Association).

52. Environmental Protection Act Regulation on Copper Cliff Smelter Complex (March 4, 1980); Ontario Ministry of the Environment, Order to Inco Ltd. amending the control order issued July 27, 1978, (Aug. 28, 1980); Press Release from Canadian Embassy, Public Affairs Division, *Ontario Hydro Program to Cut Acid Rain*, (Feb. 3, 1981) (this program will require installation of the first flue gas scrubbers used in Canada (for about 1000 MW of coal-fired capacity) as well as use of low NO_x burners, and a greater reliance on low sulfur fuels (including washed coal) and non-polluting electrical generating capacity).

53. Speech by the Honourable John Roberts before the International Association of Water Pollution Research (June 25, 1980) (available from Environment Canada).

54. Zimmerman, *Canada Sees Acid Rain Life in Lakes*, Cleveland Plain Dealer, August 3, 1981, at 1A; and *Acid Rain, An Interview with Dr. J. Stuart Warner, Vice President Inco Limited, Inco Triangle*, Nov.-Dec., 1979.

55. *See supra* note 42.

nada's highly partisan parliamentary system. Also, and perhaps more importantly, Canadian sources of sulfur dioxide pollution have been subjected to new control requirements. INCO has been required to reduce its Sudbury emissions by a regulation issued directly from the provincial cabinet, an unprecedented move.[56] And Ontario Hydro, the provincially owned utility system, has initiated a program to reduce its aggregate sulfur dioxide and nitrogen dioxide emissions forty percent by the year 1990.[57]

These steps were designed as much to increase the pressure for abatement action in the United States as to directly reduce the acid deposition in Canada.[58] Canadian officials are particularly anxious to discourage a U.S. response to international air pollution problems similar to the cost/benefit calculus that fashions U.S. domestic air pollution policies. As Ray Robinson, one of the Canadian government's leading spokesmen on acid rain, explained,

> There are special problems involved in trying to use cost/benefit analysis to address problems which spill across the Canada-United States boundary. In the case of acid rain I have little doubt that the true costs of damage more than justify large control expenditures. However, I would have to say as a matter of principle that the high cost of control cannot be used to legitimize extensive damage in another country. This must be true across an international boundary, whatever means a country may choose to use to manage its internal trade-offs.[59]

The Canadian Parliamentary Subcommittee on Acid Rain released a report in 1981 recommending a number of changes in Canadian environmental laws to strengthen controls on Canadian sulfur and nitrogen dioxide emissions.[60] The subcommittee also urged that the United States and Canada adopt an air quality agreement.[61]

In an unprecedented move that same year, the Ontario Ministry of the Environment formally participated in U.S. EPA administrative proceedings concerning the relaxation of emission

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56. *See supra* note 52. Because the new emission limitation is a regulation issued by the provincial cabinet rather than to an Ontario Department of the Environment "control order," the more conventional route for environmental regulation, it is effective immediately and cannot be appealed.

57. *See supra* note 52.

58. 5 PARL. DEB., H.C. 5800 (Dec. 16, 1980).

59. R. Robinson, Recognizing the True Cost of Acid Rain, *in* Acid Rain: A Transjurisdictional Problem in Search of Solution, Proceedings of a Conference, Buffalo, New York, May 1 and 2, 1981, Publ., Buffalo: Canadian-American Center, 1982.

60. SUB-COMMITTEE ON ACID RAIN OF THE STANDING COMMITTEE ON FISHERIES AND FORESTRY 32ND PARL., SESS., STILL WATERS: THE CHILLING REALITY OF ACID RAIN 92 (Comm. Print, 1981).

61. *Id.*

limitations for midwestern power plants.[62] This unusual step indicates how gravely Ontario's officials view the relaxation of existing U.S. pollution control requirements for pollutants and sources implicated in the transboundary acid deposition problem.

Not surprisingly, the Canadians are watching developments in the U.S. Clean Air Act reauthorization debate with keen interest. A June 19, 1981, diplomatic note was sent by the Ministry of External Affairs to the State Department expressing concern that Clean Air Act revisions might impede ongoing efforts to reach an air quality accord.[63]

B. International Pollution Control Under the Canadian Clean Air Act

Section 21.1 of the Canadian Clean Air Act provides a mechanism for establishing new control requirements whenever emissions in Canada "create or contribute to" air pollution "that may reasonably be expected to constitute a significant danger to health, safety or welfare of persons" in another country.[64] Although the key phrase "welfare of persons" is undefined, the definition of "air pollution" elsewhere in the Act suggests that damages of animal and plant life are considered distinct from the welfare of persons.[65] Nevertheless, the Canadian regulatory structure is far less rigid than that in the United States. If they chose, the Environment Minister and Governor-in-Council (the Cabinet) would have ample latitude to give effect to the legislative intent of assuring reciprocity with U.S. section 115 by interpreting "welfare" to include environmental effects.[66]

To date there has been no alteration of Canadian pollution control requirements under section 21.1 to address international concerns. The touchstones for revision of the requirements under this section are similar to those of the U.S. law. First, the Minister of the Environment must conclude that there is "reason to believe that an air contaminant . . . in Canada creates or contributes to

62. Ontario Ministry of the Environment, A Submission to the U.S. EPA Opposing Relaxation of SO_2 Emission Limits in State Implementation Plans and Urging Enforcement (March 12, 1981). Ohio v. EPA, No. 81-1310 (D.C. Cir. 1981).

63. Diplomatic note from the Embassy of Canada to the U.S. Department of State, No. 286, June 19, 1981.

64. Clean Air Act, CAN. STAT. ch. 45, § 21.1(1) (1980).

65. Clean Air Act, CAN. STAT., ch. 45, § 2(1)(b) (1980). Air pollution is defined as the "condition of ambient air . . . *that endangers the health, safety or welfare of persons*, that interferes with the normal enjoyment of life or property, *that endangers the health of animal life*, or *causes damage to plant life* or property." *Id.* (emphasis added).

66. Government agency discretion in Canada is enhanced by the fact that judicial recourse is not readily available to interested parties seeking to challenge the implementation of parliamentary directives.

the creation of air pollution that may reasonably be expected to constitute a significant danger to the health, safety or welfare of persons in a country other than Canada."[67] Upon this determination, the Minister is directed to recommend to the Governor in Council "such specific emission standards as he may consider appropriate for the elimination or significant reduction of that danger."[68] Finally, the Governor in Council is authorized to prescribe the specific emission standards recommended by the Minister if the Governor in Council is satisfied (1) that the Minister has made a "reasonabl[e] endeavor" to secure provincial action and has been unsuccessful, and (2) that there is reciprocity.[69] The foreign country must provide by law essentially the same kind of benefits in favor of Canada with respect to abatement or control of air polluton as is provided in favor of that country pursuant to the Act.[70]

The implementation of section 21.1 currently appears to be less likely than the implementation of the U.S. Clean Air Act section 115 because the Canadian contribution to pollution problems in the United States is proportionately smaller than the U.S. contribution to Canadian problems,[71] and because current Canadian concern over acid deposition is already resulting in new abatement problems.[72] Moreover, consistent with the preference for voluntary provincial action, section 21.1 relies initially on the provincial government to take whatever action is needed to eliminate or significantly reduce the international problem.[73] The high level of concern over acid deposition in eastern Canada and the political support for measures to control air pollution would probably facilitate provincial action. If provincial control actions were not forthcoming, and the Environmental Minister had made a "reasonable endeavor" to secure provincial cooperation, the national government could take the unusual step of establishing binding federal emission limitations.[74] The implementation of the binding

67. Clean Air Act, CAN. STAT., ch. 45, § 21.1(1) (1980).

68. Clean Air Act, CAN. STAT., ch. 45, § 21.1(1) (1980). Except with regard to federal sources, the Minister is not authorized to make such a recommendation without first determining, after consultation with the governing province, that the problem cannot or will not be eliminated or reduced adequately through provincial action. *Id.* The foreign nation is to be extended an opportunity to make "representations" with respect to the Minister's proposed recommendation. *Id.* § 21.1(2)(b).

69. *Id.* § 21.2.

70. *Id.*

71. It has been estimated that the U.S. contributes four times as much sulphur dioxide and ten times as much nitrogen oxide to Canada as Canada returns. SECOND REPORT OF THE U.S.-CANADA RESEARCH CONSULTATION GROUP ON THE LONG RANGE TRANSPORT OF AIR POLLUTANTS (Oct. 1980).

72. *See supra* note 52.

73. Clean Air Act, CAN. STAT., ch. 45, § 21.1(3) (1980).

74. *Id.* § 21.2(1).

national standards would probably be a slow process, however, in the absence of active provincial support.

III. NATIONAL LAWS AND TRANSBOUNDARY AIR POLLUTION

The domestic air pollution control regimes in both Canada and the United States are structured toward translating general legislative objectives (i.e., projection of the public health and welfare) into specific numerical goals (ambient air quality standards or objectives).[75] These yardsticks for environmental protection, which represent delicate political compromises between environmental and economic considerations, are not readily transferrable to other nations. Without the benefit of such concrete guidelines, we are left with general statements concerning the need to protect foreign health and welfare. Such maxims do little to define international air pollution concerns or to identify appropriate responses. Consequently, the environmental agencies are allowed wide latitude in the selection of remedial action.[76]

This discretion enhances the potential for an unhealthy interplay with the negotiations to formulate a bilateral accord. While it seems reasonable to think that the international provisions of the two Clean Air Acts, section 115 and section 21.1, could be constructively coupled with concurrent air quality negotiations, perhaps assisting in efforts to identify and define transboundary problems, this has not happened.

Action under section 115 or section 21.1 is complicated by ongoing bilateral negotiations. As environmental officials in both nations seek a negotiating posture to their maximum advantage, they may be reluctant to freely yield anything through unilateral action that they could use at the bargaining table. Moreover, action through domestic statutes may seem unnecessary when a bilateral accord is in the works.[77] In fact, agreements to deal with complex international environmental problems can require many years of effort, especially where scientific uncertainty is prevalent.

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75. Clean Air Act, CAN. STAT., ch. 47, § 4(1) (1971); and U.S. Clean Air Act, 42 U.S.C. §§ 7408, 7409 (Supp. IV 1980).

76. In Canada, the entire section 21.1 process is discretionary since the Cabinet is authorized but not required to put into effect the emission guidelines recommended by the minister. Such discretion is, however, characteristic of nearly all legislation under Canada's parliamentary system in which the executive and legislative branches are, for all practical purposes, fused. There is little incentive for the executive branch to tie its own hands by having Parliament pass legislation which includes specific and binding directives to goverment agencies.

77. Note, however, that in enacting section 115, Congress clearly intended to control international air pollution as a matter of domestic policy. Congress never intended to make control of transboundary pollution contingent upon the conclusion of an international accord.

Interim progress toward the control of North American transboundary air pollution could be made if the international sections of both the U.S. and Canadian Clean Air Acts were amended to allow a single independent scientific committee to play a major role in defining international air pollution problems and in identifying appropriate responses. The U.S.-Canada International Joint Commission (IJC) has played a similar, although somewhat more confined, role in the implementation of bilateral water quality accords. An extension of the IJC, or perhaps some new international collegial body, could serve in this capacity. If such an entity were already functioning well, it could be given a pivotal role in coordinating and implementing a bilateral air quality agreement.

IV. INTERNATIONAL LAW AND TRANSBOUNDARY AIR POLLUTION

Most casebooks on international law discuss the *Trail Smelter Arbitration*,[78] which helped resolve a protracted air pollution dispute in the 1920's and 1930's between Canada and the United States. In this dispute, Canada conceded that fumes from a smelter at Trail, British Columbia, were causing damage in adjacent areas of Washington State. A tribunal was created to determine, inter alia, the amount of damages. In a widely quoted dictum, the tribunal asserted that "no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another . . . when the case is of serious consequences and the injury is established by clear and convincing evidence."[79]

Unfortunately, neither the facts of the controversy itself nor the arbitrators' dictum have much application to today's acid rain problems. In *Trail Smelter*, a specific source emitted specific fumes which damaged adjacent—albeit transboundary—areas. Acid rain contains an amalgam of pollutants, derived from multiple sources, which are deposited hundreds of miles downwind from those sources. Moreover, Canada admitted liability and agreed to allow U.S. courts to assess damages. When the U.S. courts declined to do so, both countries agreed to let a special binational tribunal "arbitrate" the amount of damages.

Nations today are exceedingly protective of both their sovereignty and their pollution prerogatives. They very rarely relinquish jurisdiction over cases of pollution emanating from their

78. Trail Smelter Case (U.S. v. Canada), 3 R. INT'L ARB. AWARDS 1905 (1941).

79. Trail Smelter Case at 1965 (This dictum is derived from the Roman legal maxim, *sic utero tuo, ut alienum non laedas*: "use your own property in such a manner as not to injure that of another." BLACK'S LAW DICTIONARY 1238 (5th ed. 1979)).

territory, and even more rarely admit liability for such pollution. Notwithstanding the legal doctrines recognized by *Trail Smelter*, and more recently articulated in principle 21 of the declaration produced by the 1972 United Nations Conference on the Human Environment,[80] as well as in the preamble to the ECE Convention of 1979 on Long Range Transboundary Air Pollution,[81] international law is of little effect in the field of transboundary air pollution and almost invariably gives way to considerations of national interest.

V. MULTILATERAL AGREEMENTS

The ECE Convention of 1979 on Long Range Transboundary Air Pollution[82] has been ratified by both the United States and Canada.[83] The ECE Convention is the first international accord on air pollution and was hailed by its chairman, Olof Johansson of Sweden, as "a breakthrough in the development of international environmental law."[84] However, it provides merely for the sharing of information, collaborative research, and continued monitoring of pollutants and rainfall. It contains no numerical goals, limits, timetables, abatement measures or enforcement provisions. Contracting parties, including the United States and Canada, have merely undertaken to "*endeavor* to limit, and *as far as possible*, *gradually* reduce and prevent air pollution, including long-range transboundary air pollution."[85] They have also agreed to adopt "the best available technology which is *economically feasible*."[86] No country has to alter its status quo unless it chooses to.

In June 1982, the Swedish government convened a confer-

80. Report of the United Nations Conference on the Human Environment (Stockholm, 5-16 June, 1972), 1 U.N. GAOR (21st plen. mtg.), U.N. Doc. A/CONF.48/14/Rev.1 at 5 (1972), *reprinted in* 11 INT'L LEGAL MATERIALS 1416, 1420 (1972). For a general discussion of other principles of the Stockholm Declaration dealing more specifically with transboundary pollution, *see* J. BURROS & D. JOHNSTON, THE INTERNATIONAL LAW OF POLLUTION (1974).

81. This Convention was drawn up and adopted by the U.N. Economic Commission for Europe, whose members include the countries of western and eastern Europe, as well as Canada and the United Staets. 1 U.N. ECE, Annex I, U.N. Doc. E/ECE/HLM 1/2 (1979), *reprinted in* 18 INT'L LEGAL MATERIALS 1442-43 (1979) [hereinafter cited as ECE CONVENTION].

82. *Id.*

83. *Id.* For an analysis of the ECE Convention, *see* Rosencranz, *The ECE Convention of 1979 on Long Range Transboundary Air Pollution*, 75 AM. J. INT'L L. 975 (1981).

84. Official remarks of the Chairman of the High Level Meeting within the Framework of the United Nations Economic Commission for Europe on the Protection of the Environment (Nov. 15, 1979).

85. ECE CONVENTION, *supra* note 81, art. 2 (emphasis added).

86. *Id.* art. 6 (emphasis added).

ence on acidification of the environment to which all thirty-one signatories of the ECE Convention were invited, including Canada and the United States. Both Canada and the United States were represented at the conference by sizeable delegations, and both countries' delegates joined in the conference's unanimous final statement declaring that "further concrete action is urgently needed within the framework of the [ECE] Convention to reduce air pollution, including long range transboundary air pollution."[87] Such action, according to the unanimous statement, should take the form of concerted programs, within the framework of the ECE Convention, to reduce sulfur and nitrogen emissions, using the best available technology which is economically feasible.[88] But the ECE Convention has no power to compel action, and it is not very likely that these hortatory statements will lead to actual abatement.

VI. DOMESTIC ADJUDICATION TO RESOLVE TRANSBOUNDARY DISPUTES

Domestic adjudication is sometimes successful in resolving international environmental disputes, particularly if there are no difficult choice of law questions and the source of injury and amount of damages are determinable.[89] Several western European countries afford citizens of neighboring states access to their courts and administrative proceedings on the same footing as citizens of the forum state.[90] Under the Nordic Convention of 1974 on the Protection of the Environment,[91] Norway, Sweden, Denmark, and Finland have specifically undertaken to treat national pollution discharges causing damage *beyond* national borders in exactly the same way as discharges causing damage locally.[92] In

87. *See* SWEDISH MINISTRY OF AGRICULTURE, REPORT: THE 1982 STOCKHOLM CONFERENCE ON ACIDIFICATION OF THE ENVIRONMENT, at 31 (1982).

88. *Id.*

89. *See* W. Poro v. Houillieres du Bassin de Lorraine, Oberlandesgericht Bayern, Saarbrücken, (1957) (where a German motel owner sued a French electric power plant, whose emissions of soot and smoke damaged crops, flowers, and the recreation business in German territory across the border. The German court awarded damages pursuant to French law. Subsequently, the defendant company installed effective pollution control equipment financed by joint French-German government contributions pursuant to a pre-existing French-German treaty dealing, inter alia, with boundary pollution control).

90. For ten years, the Organization for Economic Cooperation and Development (OECD) has been advocating equal rights of access and nondiscrimination for foreigners seeking transboundary pollution remedies in domestic courts and administrative proceedings. *See* OECD, RECOMMENDATION FOR EQUAL RIGHT OF ACCESS IN RELATION TO TRANSFRONTIER POLLUTION, Doc. C (74) 224 (1974).

91. Nordic Convention on the Protection of the Environment, February 19, 1974, *reprinted in* 13 INT'L LEGAL MATERIALS 591 (1974).

92. *Id.* Art. 2.

environmental suits for compensation or injunctive relief, the Nordic Convention guarantees all four countries' citizens equal access to all four countries' courts.[93]

Even without an international agreement over equal access, courts in the United States have traditionally entertained suits involving extraterritorial damages. In *State v. Wyandotte Chemical Corp.*,[94] the Attorney General of Ohio successfully sued for injunctive relief and damages against the defendant Canadian and Michigan corporations for mercury pollution in Lake Erie found to be detrimental to Ohio citizens.

Another relatively recent U.S. case demonstrates the capability of domestic courts to resolve disputes involving transboundary air pollution. In *Michie v. Great Lakes Steel*,[95] several residents of LaSalle, Ontario, brought a common law nuisance action in the federal district court in Detroit, Michigan,[96] claiming that emissions from defendants' smokestacks were damaging their property and endangering their health. Plaintiffs eventually recovered large damages. Significantly, on interlocutory appeal, the appellate court in *Michie* decided that several polluters can be held jointly and severally liable for damage that results from their joint emissions if it is impossible to apportion the damage among them. On remand, the district court determined that the plaintiffs had suffered different levels of injury depending on their geographic

93. *Id.* Art. 3 and 4.

94. Case No. 904571 (Cuyahoga County, Ohio, March, 1972). Previously, the U.S. Supreme Court had declined to take original jurisdiction over the matter, but implicitly confirmed the competence of Ohio's state courts to deal with the transnational dispute involved. 401 U.S. 493 (1971). *Cf.* Judge Learned Hand's pronouncement in the landmark *Alcoa* case: "[I]t is settled law . . . that any state may impose liabilities, even upon persons not within its allegiance, for conduct outside its borders that has consequences within its borders which the state reprehends . . ." 148 F.2d 416, 443 (2d Cir. 1945).

In *Wyandotte*, the Ohio courts presumed that Canadian courts would enforce the Ohio decree, including the grant of injunctive relief. Since the Ontario Water Resources Commission had also ordered abatement of the mercury discharges (401 U.S. at 502), defendants voluntarily ceased their polluting activity. The rules in Canadian courts regarding enforcement of foreign judgments might otherwise have posed difficulties. *See generally*, Arbitblit, *The Plight of American Citizens Injured by Transboundary River Pollution*, 8 ECOLOGY L.Q. 339 (1979). Under § 53 of the American Law Institute's Second Restatement of the Conflict of Laws (1969), a court is empowered to grant injunctive relief against a person in a foreign state if a court in a foreign state would also grant injunctive relief in the same circumstances. *See also* RESTATEMENT (SECOND) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES, § 18 (1962).

95. 495 F.2d 213 (6th Cir. 1974). *See also* Case Note in UTAH L. REV. 603 (1974). *Cf.* Ianni, *International and Private Actions in Transboundary Pollution*, 11 CAN. Y.B. INT'L L. 258 (1973).

96. The U.S. federal diversity of citizenship statute (defining the jurisdiction of federal courts) specifically allows foreign nationals to sue in federal courts when the acts causing their alleged injury occurred in the U.S.

proximity to defendants' smokestacks. Plaintiffs were divided into three classes based on their residential locations, and the amount of damages varied with each class.[97]

Notwithstanding the creativity and resourcefulness of the *Michie* courts, judgments for damages seem poorly suited to disputes arising from the effects of acid rain. Although such effects—including injury to fish stocks, loss of tourism, enhanced corrosion, and reduced agricultural and forest productivity—are compensable types of injury, the multiplicity of pollution sources and their relative contribution to atmospheric loadings make it extremely difficult to prove a claim, assign liability, or provide effective remedies.

Canadian courts avoid the problem by declining to entertain suits involving extraterritorial damage, following the rule in *British South Africa Co. v. Companhia de Mozambique*.[98] In that case, the House of Lords decided that English courts have no jurisdiction over actions involving damage to real property located in another jurisdiction.

A joint committee representing the Uniform Law Conference of Canada and the Commissioners on Uniform (U.S.) State Laws has drafted a "Uniform Transboundary Pollution Reciprocal Access Act."[99] The proposed Act would abrogate the rule in *British South Africa Co.* and provide the victims of transboundary pollution equal access to the courts of the jurisdiction where the pollution originated.

Even if this proposal led to the enactment of uniform state and provincial laws, a court would have to be bold indeed to entertain a suit involving acid rain damages. In any such suit, the court would be called upon to determine the nature and extent of damages in the face of myriad scientific uncertainties, and would be asked to hypothesize source-receptor links on the basis of tenuous pollution transport models. Neither American nor Canadian courts seem likely to venture into this unsettled area in the foreseeable future.

VII. NORTH AMERICAN COOPERATIVE EFFORTS

A. U.S.-Canada Agreements Governing Transboundary Water Pollution

U.S.-Canada environmental relations are marked by successful efforts to resolve international water pollution problems, be-

97. Michie v. Great Lakes Steel, No. 35019 (E.D. Mich. June 20, 1975).

98. [1893] A.C. 602 (S.A.).

99. National Conference of Commissioners on Uniform State Laws, Draft, Transboundary Pollution Reciprocal Access Act, with Prefatory Note and Comments 9A U.L.A. 234 (West Supp. 1982).

ginning over seventy years ago with the 1909 Boundary Waters Treaty. There the two governments agreed that "boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property of the other."[100] The treaty provided for the creation of the International Joint Commission (IJC), an impartial body to monitor progress toward achievement of the agreement's objectives and to assist in resolving disputes. The IJC has played an active role in promoting progress in response to increasingly complex environmental problems ever since, and the organization has served as a model for other nations in bilateral water pollution agreements.[101]

The commitment to control international water pollution was further defined in the Great Lakes Water Quality Agreements of 1972 and 1978. The 1972 agreement was one of the first international accords to set water quality standards for boundary waters.[102] On the basis of reports by the IJC enhancing scientific understanding of pollution in the Great Lakes, the 1972 accord was supplemented by the 1978 agreement, which outlined with great specificity the steps to be taken to achieve water quality objectives.[103] The two governments have recently engaged the IJC in the air pollution area through references under the Boundary Waters Treaty and the Great Lakes Water Quality Agreement of 1978. In particular, the IJC has become involved in the transboundary air pollution problem in the Detroit-Windsor area.[104]

The first bilateral accord directly addressing transboundary air pollution arose in response to concerns over the impact of air pollution on the Great Lakes basin ecosystem.[105] In the 1978 Great Lakes Water Quality Agreement the two governments agreed to develop and implement:

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100. Article IV, Boundary Waters Treaty of 1909, United States-Canada U.S.T. 548, 36 Stat. 2448.

101. A. KISS, SURVEY OF CURRENT DEVELOPMENTS IN INTERNATIONAL ENVIRONMENTAL LAW 75 (1976).

102. Agreement Between Canada and the United States of America on Great Lakes Water Quality, Apr. 15, 1972, United States-Canada, 23 U.S.T. 2813, T.I.A.S. No. 7470, *reprinted in* J. BURROS & M. JOHNSTON, THE INTERNATIONAL LAW OF POLLUTION 127 (1974).

103. Agreement Between the United States and Canada on Great Lakes Water Quality, *reprinted in* INT'L ENV'T REP. (BNA), 31:0601.

104. *See generally*, MICHIGAN/ONTARIO AIR POLLUTION BOARD, ANNUAL REPORT TO THE IJC (October, 1979).

105. Reports of the IJC have emphasized the impact of air pollution on the water quality of the Great Lakes. The 1978 Report of the Great Lakes Water Quality Board concluded that: "[T]he atmosphere provides an important source for a variety of pollutants [in the Great Lakes] including phosphorous, nitrogen, lead, copper, other heavy metals, sulphates, PCBs, polycyclic aromatic hydrocarbons and other substances." Great Lakes Water Quality Board, 1978 Annual Report to the International Joint Commission at 79 (July, 1979).

> programs to identify pollutant sources and relative source contribution . . . 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.[106]

B. Progress Toward a Bilateral Air Quality Agreement

During the last few years, as the two governments have come to regard transboundary air pollution more seriously, cooperative activity has increased. In 1978 the Bilateral Research Consultation Group on the Long Range Transport of Air Pollutants was established to coordinate and assess research efforts.[107] In the 1979 Joint Statement on Transboundary Air Quality, the two nations agreed to develop a bilateral agreement to achieve the "prevention and reduction of transboundary air pollution which results in deleterious effects."[108]

In August 1980, the U.S. Secretary of State and the Canadian Minister of External Affairs signed a "Memorandum of Intent Concerning Transboundary Air Pollution" (MOI).[109] This document formally recognizes the importance and urgency of the problem and declares 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."[110] The MOI commits the two governments to take "*interim actions* available under current authority to combat transboundary air pollution"[111] and establishes a framework and timetable for nego-

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106. *See* Article VI, Agreement Between Canada and the United States, *supra* note 103, at 0640.

107. The Research Consultation Group has published two comprehensive assessments of the transboundary air pollution problem: THE LONG RANGE TRANSPORT OF AIR POLLUTANTS PROBLEM IN NORTH AMERICA: A PRELIMINARY OVERVIEW (Oct. 1979); and SECOND REPORT OF THE U.S.-CANADA RESEARCH CONSULTATION GROUP ON THE LONG RANGE TRANSPORT OF AIR POLLUTANTS (Oct. 1981).

108. Joint Statement on Transboundary Air Quality, *see supra* note 25.

109. Memorandum of Intent Between the Government of Canada and the Government of the United States, *see supra* note 25.

110. *Id.*

111. *Id.* (emphasis added). The memorandum explains that the "interim actions" include:

> —Develop(ment) of domestic air pollution control policies and strategies and "legislative or other support" necessary to put these policies into effect,
>
> —Promotion of "vigorous enforcement of existing laws and regulations as they require limitations of emissions . . . in a way which is responsive to the problems of transboundary air pollution," and
>
> —Continuation of long standing practices of advanced notification and consultation, especially as they pertain to proposed major industrial

tiations to forge an air quality agreement. Toward this end, the governments agreed to establish joint technical and scientific "work groups" to assist in the preparations for and conduct of negotiations.[112]

The MOI commitment to take all possible action to reduce transboundary pollution through the respective domestic pollution control systems is sweeping on its face. However, this commitment has been interpreted differently on each side of the border. Ontario, for example, has initiated new control programs, and has argued that the MOI commits the United States to take similar steps or, at the very least, not to allow emissions to increase.[113] In the United States, on the other hand, the commitment to take "interim actions available under current authority" has not been construed to require more stringent control of long-range air pollution through the Clean Air Act provisions on interstate or international air pollution. In a 1981 administrative proceeding, the United States EPA ruled that international impacts need not be considered in relaxing emission limitations for existing sources. The agency concluded the the MOI mandate to "promote vigorous enforcement of existing laws and regulations" is affected so long as emission limitations are adequate to assure compliance with ambient air quality standards locally, even if emissions increase from current levels.[114]

The precise legal status of the MOI commitments is unclear. Certainly they do not carry the force of international obligations imposed by a treaty or an executive agreement. As a joint statement of government intention the MOI draws force from the gen-

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development or proposed changes of policy which might significantly affect transboundary pollution.

The notification and consultation process is normally implemented through the U.S. Department of State and the Canadian Department of External Affairs. It has not routinely been applied to proposed actions leading to increases in regional pollutant loading and therefore potential long range transboundary impacts. Nor is it clear what magnitude of change warrants notification and consultation.

112. These working groups have prepared a number of advisory reports on technical aspects of the transboundary air pollution problem.

113. *See* K. Norton, Keynote Address I, *in* Acid Rain: A Transjurisdictional Problem in Search of Solution, Proceedings of a Conference, *supra* note 59. (Mr. Norton is Ontario's Minister of the Environment).

114. *See supra* note 27. This U.S. interpretation of the MOI commitments recently prompted Canadian Environment Minister John Roberts to observe sardonically, "We find that regulations in the United States are being relaxed—with two excuses. First, that ambient air quality standards are being met or improved. But ambient air quality is by definition, local; it is not the standard relevant to long-range pollution transportation. Second, we are told that the existing regulations permit exemptions. Thus, in relaxing standards, the existing regulations are really being vigorously applied." *Solving the Acid Rain Equation*, *supra* note 51, at 926.

eral good will between the United States and Canada. In allowing SO_2 emission levels to increase despite the provisions of the MOI, the United States is, at the least, calling into question the presumption of good faith implementation. More importantly, the emission increases signal a Reagan Administration slowing of the momentum toward a U.S.-Canada agreement.

To date, bilateral negotiations have made little headway. After nearly two years of preliminary talks, formal negotiations began in the fall of 1981. On February 24, 1982, the Canadian team, apparently satisfied that adequate attention had been devoted to preliminaries, offered a proposed treaty formulation for the first time.[115] The Canadian proposal, a thirty-page draft modeled on the approach in the Great Lakes Agreements, called for a fifty percent reduction in sulfur dioxide emissions from Canada east of the Saskatchewan-Manitoba border and a parallel rollback in the United States east of the Mississippi River. The proposal was ultimately rejected by the U.S. negotiators in June 1982 at the fourth negotiating session.

Canadian Environment Minister John Roberts was keenly disappointed with the state of negotiations in general and with the Reagan Administration's rejection of Canada's proposal for a joint fifty percent emission rollback.[116] He finds the U.S. stance inconsistent with the MOI commitment to "promote vigorous enforcement of existing laws requiring limitations of emissions" to help abate acid rain.[117]

An effective treaty will be difficult to craft. A key hurdle common to all international agreements is the natural unwillingness of nations to yield some degree of sovereignty, a problem which should not be underestimated where national pollution control and energy development policies are involved. It will be a major task to develop a bilateral approach concrete enough to assure a reduction in transboundary flow, yet responsive to continually evolving scientific findings about long range air pollution. The accord must be compatible with the particular approaches to air pollution control in the two counties. Moreover, it must be acceptable to the public of both nations and to the Canadian provinces, whose approval is essential to successful implementation. Finally, some mechanism for dispute resolution must be created

115. *See Canada Gives U.S. Draft Agreement at Joint Talks on Acid Rain Control*, INT'L ENV. REP., Current Reports (Mar. 10, 1982).

116. *See Solving The Acid Rain Equation, supra* note 51, at 925.

117. *Id.* at 926. According to Roberts, Canada has already undertaken to fulfill its MOI commitment by acting *unilaterally* to reduce SO_2 emissions by 25% in Manitoba, Ontario, Quebec and the Maritime Provinces. *See* Speech at the Commonwealth Club of California, *supra* note 48, at 12.

for resolving the complex scientific and technical issues which could lead to differing interpretations of bilateral commitments.

In the Great Lakes Water Quality Agreements of 1972 and 1978,[118] the United States and Canada successfully overcame a number of similar obstacles. Scientific uncertainty was dealt with by formulating successive agreements. The 1978 accord was a more specific extension of the principles established in the 1972 agreement based, in part, on new scientific data developed through cooperative U.S.-Canadian research efforts.

In negotiations on water quality agreements, concerns of national sovereignty and the desire to retain the integrity of domestic pollution control strategies were accommodated through the use of water quality objectives to be achieved through the independent actions of both nations. Air quality standards do not offer the convenient yardstick for progress that water quality standards offered in the context of Great Lakes pollution. In the long range transport of air pollution, the air is essentially a conduit by which pollutants travel to the medium (land and water) in which they cause damage. Hence, a bilateral accord must focus on limiting aggregate emissions loading in designated regions. While such a policy would allow wide latitude in establishing source-specific emission limits, implementation could be difficult to monitor and enforce bilaterally.

In formulating a response to transboundary air pollution, an initial accord might consider general principles concerning the responsibility to control transboundary pollution, mechanisms for dispute resolution and compensation of injured parties, and a program to achieve moderate reductions in pollution loadings. A subsequent agreement might mandate an abatement program directly designed to remedy known transboundary pollution effects. The mandated changes in emissions loading would be based on cooperatively developed scientific information.

In their effort to control their international water pollution problems, the United States and Canada have made effective use of a binational independent collegial body—the International Joint Commission—to monitor and help implement joint agreements. A comparable binational institution to monitor progress on transboundary air pollution abatement and to provide periodic scientific assessment could play a significant role in implementing a U.S.-Canada air quality treaty.

CONCLUSION

The United States and Canada have a mutual interest in

118. *See supra* notes 102, 103.

abating the flow of air pollutants, especially acid rain precursors, across their common border. Domestic provisions in each country aimed at controlling transboundary air pollution seem excessively vulnerable to domestic political and economic pressures. Domestic suits are too limited in their scope, and problematical in other ways. The international legal structure offers useful principles of environmental responsibility, but they are neither sufficiently defined nor sufficiently enforceable to support effective application to specific controversies.

A bilateral agreement, the implementation of which is insulated from national and international politics, promises to be the key to effective abatement. Canada and the United States must jointly fashion a binational institution or mechanism to implement their agreement, and in doing so must be prepared to surrender some degree of sovereignty. In such an agenda lies the main hope for progress in reducing transboundary air pollution and acid rain in North America.