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TRANSBOUNDARY POLLUTION: ACID RAIN AND UNITED STATES-CANADIAN RELATIONS

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To every action there is always opposed equal reaction: or, the mutual actions of two bodies upon each other are always equal, and directed to contrary parts.

—Sir Isaac Newton (1642–1727)¹

I. INTRODUCTION

Newton's third law of motion addresses the quid pro quo attributes of the physical universe.² Newton observed that action was inversely related such that advancement by one body obstructed the advancement of an opposing body to a similar degree.³ Although Newton's law focused on motion, there is an even more fundamental principle embedded in the law: a change of any type, exerted upon a mass, will necessarily alter the state of other bodies juxtaposed to that mass.

Unfortunately, scientists did not discover the full impact of Newton's axiom and its relevance to the earth's ecosystem for many years. Scientists were slow to recognize the link between technological advancements and changes in the physical environment. Failing to recognize the quid pro quo attributes of nature, scientists did not anticipate that one of the ecosystem's reaction to industrialization

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¹ Sir Isaac Newton, *Mathematical Principles of Natural Philosophy*, in THE AGE OF REASON 108 (Louise L. Snyder ed., 1955).

² See *Id.*

³ *Id.*

would be acid rain. Instead of viewing the human race as caretakers of the earth's ecosystem, early industrialists acted as though the human race were separate and apart from that system. The result of their earlier unenlightened use of the ecosystem is at the root of most, if not all, of our modern-day air pollution problems.

The Industrial Revolution began in England during an era known as the Age of Reason.⁴ By changing the ratio of open fields to towns, encouraging population shifts and new social structure, the Industrial Revolution forever changed the face of England.⁵ Sleepy hamlets turned into thriving villages. Prosperous villages became populous towns and giant chimney stacks, releasing the gaseous byproducts of coal-burning furnaces, began to dominate the skyline.⁶ The Industrial Revolution, once underway, swiftly moved across Europe and migrated to North America.

In 1863, shortly after the conclusion of the Industrial Revolution, England passed the first Clean Air Act.⁷ The Act was aimed at reducing the local effects of air pollution on the environment and diminishing health risks for those residing in densely industrialized regions.⁸ The term "acid rain" originated in 1872, to describe precipitation in and around England's heavily industrialized areas. By then, industrialization had reached a transcontinental level and a byproduct of industrialization, acid rain, would present the international community with one of the most vexing problems of the twentieth century.⁹

This Article explores the international law issues associated with transboundary air pollution. While the primary focus of this Article is acid rain and its effect on the relationship between the United States and Canada, attention is also given to the development of international environmental law. Section II gives a brief description of the cause and effect of acid rain. In section III, the Article examines the existing principles of international law. Next, in section IV, this Article explores the efforts of the United States and Canada to resolve transboundary pollution issues. The focus of the discussion will be on acid rain's effect on the relationship between the United

⁴ See generally, *id.* (the period of enlightenment and achievement which later became known as the Age of Reason covers approximately the period 1650 to 1800).

⁵ See generally, THOMAS S. ASHTON, *THE INDUSTRIAL REVOLUTION 1760-1830* (1964).

⁶ See *Id.* at 58-93.

⁷ Christian Cleutinix, *European Community Air Pollution Abatement Policy*, 17 U. TOL. L. REV. 113, 115 (1985).

⁸ See *Id.*

⁹ See *Id.*

States and Canada. This Article concludes with an analysis of present efforts to resolve transboundary air pollution between the United States and Canada.

II. WHAT IS ACID RAIN?

Burning coal releases sulfur which combines with the oxygen in the air to form sulfur dioxide (SO₂).¹⁰ The amount of SO₂ created depends upon the combustion process and the sulfur content of the coal.¹¹ Coal's sulfur content varies with the location of the coal mine.¹² In the United States, power plants utilizing high sulfur coal generate about forty percent of the country's electricity.¹³ Once released into the atmosphere, SO₂ transforms into sulfuric acid.¹⁴ Prevailing winds then transport the compound miles away from the source.¹⁵

Although the combustion process releases primarily SO₂, coal-burning plants also release nitrogen oxides (NO_x) and carbon dioxide (CO₂) into the air.¹⁶ Additionally, emissions from motor vehicles and industrial combustion processes contribute NO_x gases to the atmosphere.¹⁷ Finally, natural processes such as decomposition of organic material, forest fires and volcanic eruptions release SO₂ and NO_x into the atmosphere.¹⁸ Globally, emissions of SO₂ and NO_x by natural phenomena comprise significant portions of the volume of acid rain precursors.¹⁹ In the more heavily industrialized regions such as Europe and North America, however, human activity contributes a much larger part of the total emissions.²⁰ About ninety percent of

¹⁰ Ned Helme & Chris Neme, *Acid Rain: The Problem*, 17 E.P.A. J., Jan.—Feb. 1991, at 18, 19.

¹¹ *Id.* In the U. S. high sulfur anthracite coal is produced by the lower midwestern states and northern Appalachia region. Low sulfur bituminous coal is more abundant in the West and East where there are also some high sulfur coal reserves. *Id.*

¹² *Id.*

¹³ *Id.* One power plant, producing an average of 350 megawatts daily, emits approximately 28 metric tons of SO₂ and 8.6 metric tons of NO_x, daily. WALTER E. WESTMAN, *ECOLOGY, IMPACT ASSESSMENT, AND ENVIRONMENTAL PLANNING* 271 (1985).

¹⁴ Helme & Neme, *supra* note 10, at 19.

¹⁵ *Id.*

¹⁶ *Id.* NO_x includes nitrogen oxide (NO), nitrogen dioxide (NO₂) and dinitrogen oxide (N₂O). See JOHN KOTZ & KEITH F. PURCELL, *CHEMISTRY AND CHEMICAL REACTIVITY* 824 (1987).

¹⁷ Carol Garland, *Acid Rain Over The United States And Canada: The D.C. Circuit Fails To Provide Shelter Under Section 115 Of The Clean Air Act While State Action Provides A Temporary Umbrella*, 16 B.C. ENVTL. AFF. L. REV. 1, 4 (1988-1989).

¹⁸ *Id.* at 4, n.16.

¹⁹ ACID RAIN INFORMATION BOOK 4 (David V. Bubenick, ed., 2d ed. 1984).

²⁰ See *Id.*

the total SO₂ production on the North American continent may originate from human activities.²¹

Acid rain is the result of complex chemical processes involving SO₂, NO_x and atmospheric occurrences.²² SO₂ and NO_x in the atmosphere are chemically changed into molecules of sulfate and nitrate.²³ In fact, these reactions occur fairly rapidly due to the presence of the various constituents of air pollution.²⁴ As an example, the transformation of SO₂ into sulfuric acid is facilitated by reaction with NO_x and other compounds in the air.²⁵ Prevailing winds transport these compounds hundreds of miles. The compounds return to earth in the form of acid precipitation, or dry particles that release sulfuric and nitric acid upon contact with water.²⁶ Thus, in some respects the phrase "acid rain" is a misnomer because acid rain encompasses dry deposition as well as snow, sleet, rain and other forms of precipitation. The term "acid rain" in this paper refers to both wet and dry deposition.

Precipitation is "acid rain" when the precipitation has a pH lower than 5.6, the pH of pure rain.²⁷ It should be noted that because the pH scale is logarithmic, the difference in acidity between one pH value and the next is tenfold.²⁸ Consequently, rainfall with a pH of 3.6 is one hundred times more acidic than "pure" rain.²⁹ Precipitation in parts of Canada has averaged a pH value of 3.5 while precipitation in West Virginia had a pH of 1.5 on at least one occasion.³⁰

Researchers have concluded that lake-water with a pH below 5.0 is detrimental to fish and other forms of aquatic life.³¹ In much of the eastern United States, this situation is becoming widespread as precipitation routinely has pH values between 4 and 5.³² Studies have linked forest decline in West Germany, Canada and the United States to acid deposition in those countries.³³ Acid rain also destroys

²¹ *Id.*

²² Joseph M. Schwartz, Note, *On Doubting Thomas: Judicial Compulsion And Other Controls Of Transboundary Acid Rain*, 2 AM. U.J. INT'L L. & POL'Y 361, 363-64 (1987).

²³ *Id.* at 364, n.17.

²⁴ STANLEY E. MANAHAN, ENVIRONMENTAL CHEMISTRY 331 (4th ed. 1990).

²⁵ *Id.*

²⁶ *Id.* SO₂ is 1300 times more soluble in water than is oxygen, therefore, SO₂ and water readily form a solution. Kotz & Purcell, *supra* note 16, at 736.

²⁷ Helme & Neme, *supra* note 10, at 20.

²⁸ *Id.*

²⁹ *Id.*

³⁰ Schwartz, *supra* note 22, at 365, n.22.

³¹ See Garland, *supra* note 17, at 7 n.49.

³² MANAHAN, *supra* note 24, at 345.

³³ See Garland, *supra* note 17, at 8. SO₂ has been linked to inhibition of photosynthesis in

building materials and weathers historic monuments.³⁴ More important, evidence suggests that excessive inhalation of sulfates and nitrates contributes to human respiratory ailments and that other indirect human health threats may exist.³⁵ There have been incidents during the twentieth century in which fatalities have been directly linked to acute SO₂ exposure.³⁶ For example, in 1952, four thousand deaths were blamed on excessive SO₂ in the air in London coupled with an inversion layer which prevented dispersal of the pollutant.³⁷

Scientists still have not discovered the total effect of acid rain. Thus far, scientists have linked SO₂ to diminished lung function and respiratory tract irritation in humans, reduced leaf and root growth in trees, and suppressed nitrogen fixation in symbiotic bacteria.³⁸ Scientists believe NO_x aggravates cardiovascular problems, nephritis and respiratory tract ailments in humans, reduces plant growth, causes premature leaf drop, and facilitates release of metal ions in moist soil.³⁹

If a direct causal link between pollution and damage to local areas could be discerned, the magnitude of the acid rain problem may be lessened domestically. However, because prevailing winds do not stop at state or national boundaries, acid rain is an environmental problem of international concern. Consequently, the significant ecological, cultural and political issues involved in abating acid rain are best addressed through international environmental policy-making processes.⁴⁰

some species, with deciduous trees and shrubs being more susceptible than evergreens. WESTMAN, *supra* note 13, at 286-87. NO₂ has been cited as stimulating premature leaf drop. *Id.* at 287.

³⁴ Garland, *supra* note 17, at 9.

³⁵ *Id.* at 10. See also, Schwartz, *supra* note 22, at 366. Recent studies indicate that acidification enhances the ability of toxic metals to leach into the water supply. This has a potential impact upon the entire biological chain. For example, cadmium is released as a vapor emission during the smelting process. Cadmium contaminates surrounding soil and there is evidence to suggest that it leaches and may travel readily in the environment. Plants absorb and accumulate cadmium, which, therefore, passes through the food chain. Long term exposure to low levels of cadmium can produce pulmonary disease and emphysema. Arsenic is also released during smelting, coal burning and using pesticides. It bioaccumulates readily in some aquatic organisms, such as fish and crustaceans, notably crab and lobster. Arsenic's toxic effects include liver injury, vascular disease, skin cancer and sensory impairment. CASARETT & DOULL'S TOXICOLOGY 589-93 (Curtis D. Klaasen et. al. eds., 3rd ed. 1986).

³⁶ CASARETT & DOULL'S TOXICOLOGY, *supra* note 35, at 802.

³⁷ *Id.*

³⁸ WESTMAN, *supra* note 13, at 286-87.

³⁹ *Id.* at 287.

⁴⁰ See LYNTON K. CALDWELL, INTERNATIONAL ENVIRONMENTAL POLICY: EMERGENCE AND DIMENSIONS 12 (1984).

III. INTERNATIONAL ENVIRONMENTAL LAW INITIATIVES RECOGNIZING TRANSBOUNDARY POLLUTION PROBLEMS

Can the international legal system, which is consensual by nature, resolve the issues raised by transboundary pollution? Many scholars do not believe that the international legal system has developed to the point where independent states will give prospective attention to global environmental concerns.⁴¹ Critics claim that the slow process by which usage evolves into customary international law is too time consuming, and further, that the obligations imposed on the parties in the process are not always clear.⁴² Indeed, one writer has commented that the vague obligations of customary law may promote the use of "legal fictions" by encouraging parties in dispute to distort the facts so that an otherwise irrelevant custom will apply to their case.⁴³ Despite the doubt expressed by some commentators, traditional international law has demonstrated a respectable degree of success in addressing environmental problems.⁴⁴ As a result, a coherent body of international environmental law is emerging.⁴⁵ In fact, the progressive course of international environmental law initiatives directed towards abatement of air pollution clearly indicates that a solution to transboundary pollution is very close at hand.

A. Early Intervention Efforts

It is not surprising that England, the seat of the Industrial Revolution, showed the first signs of damage caused by acid rain.⁴⁶ To combat pollution problems and mitigate future damages, British industry built taller smoke stacks to disperse emissions over a larger area.⁴⁷ While the British solution relieved local pollution, taller smoke stacks resulted in the dispersion of sulfate and nitrate molecules over the North Sea toward Europe.⁴⁸ The impact of the United Kingdom's local pollution abatement procedure gained international attention in the 1950s when pink snow was found on the hillsides of Norway facing England.⁴⁹ Evidence of acid rain moved across Eu-

⁴¹ ALLEN L. SPRINGER, *THE INTERNATIONAL LAW OF POLLUTION* 31 (1983).

⁴² *Id.*

⁴³ *Id.* at 32.

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ Fitzhugh Green, *Public Diplomacy And Acid Rain*, 17 U. TOL. L. REV. 133, 133 (1985).

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Id.*

rope, following the path of industrialization. When yellow snow appeared on slopes in Scandinavian countries windward of Germany, apprehension radiated throughout Europe.⁵⁰ These events set the stage for the first international conference addressing air pollution.

1. Stockholm Declaration

On June 5, 1972 the United Nations Conference on the Human Environment convened in Stockholm, Sweden.⁵¹ With Scandinavian countries playing a primary role, the Conference directed the international community's attention to the need for international control of transboundary pollution.⁵² Initiating an era of increased global awareness of international environmental issues, the Conference provided the theoretical basis for future international initiatives in the area of transboundary pollution.⁵³ Perhaps the Conference's most important product was the Stockholm Declaration, enunciating "principles to inspire and guide the peoples of the world in the preservation and enhancement of the human environment."⁵⁴

The Stockholm Declaration begins with seven proclamations focusing on the relationship between mankind and the environment with recognition that industrialization has adversely affected the latter.⁵⁵ The Declaration's second part consists of twenty-six principles establishing pollution as a world-wide problem.⁵⁶ Even though the principles do not directly reference acid rain, Principle 6 is broad enough to encompass an array of pollution sources.⁵⁷ The Declaration's third, and final, part consists of an Action Plan that establishes an international assessment and environmental management program.⁵⁸ The Action Plan created systems for research, information exchange, training, monitoring and evaluating environmental changes.⁵⁹

⁵⁰ *Id.*

⁵¹ Declaration of the United Nations Conference on the Human Environment, June 16, 1972, 11 I.L.M. 1416, 1416 [hereinafter Stockholm Declaration].

⁵² Schwartz, *supra* note 22, at 370-71.

⁵³ *Id.*

⁵⁴ BARRY E. CARTER & PHILLIP R. TRIMBLE, *INTERNATIONAL LAW: SELECTED DOCUMENTS* 709 (1991).

⁵⁵ Margot B. Peters, Comment, *An International Approach To The Greenhouse Effect: The Problem Of Increased Atmospheric Carbon Dioxide Can Be Approached By An Innovative International Agreement*, 20 CAL. W. INT'L L.J. 67, 75-77 (1989-1990).

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ *Id.* at 78.

⁵⁹ *Id.* at 78 n.82.

The Stockholm Declaration reinforced and synthesized existing international law. The proclamations and principles contained in the Stockholm Declaration, however, are non-binding to the extent that they do not reflect recognized principles of international law. Consequently, the Stockholm Declaration is a "soft" law document.⁶⁰ Such soft law declarations and resolutions by the United Nations and other international organizations may become *opinio juris*⁶¹ if recognized by a significant number of nations.⁶² Over time, internationally recognized declarations and resolutions evolve into rules of customary international law.⁶³

Of significance, the Stockholm Declaration specifically addresses the issue of state sovereignty.⁶⁴ A fundamental principle of international law, sovereignty recognizes that independent states have an unfettered right of action within their own borders.⁶⁵ Although the Stockholm Declaration acknowledges the right of independent states to use their resources as they choose, the Declaration qualifies that right by restricting sovereigns' resource exploitation to those usages which have a negligible impact on the rights of other states.⁶⁶ Despite the fact that sovereignty is a keystone of international law, the signatory states viewed the restrictions on state action expressed in Principle 21 of the Declaration as a restatement of existing customary international law.⁶⁷

On the whole, the Stockholm Declaration represented a significant first step towards addressing air pollution problems created by the Industrial Revolution. The Action Plan formulated at the United Nations Conference on the Human Environment led to the creation of the United Nations Environment Programme (UNEP).⁶⁸ UNEP was established in 1973 to initiate and monitor environmental pro-

⁶⁰ IRENE H. VAN LIER, *ACID RAIN AND INTERNATIONAL LAW* 97 (1980).

⁶¹ BARRY E. CARTER & PHILLIP R. TRIMBLE, *INTERNATIONAL LAW* 113 (1991). Customary international law is evidenced by a sense of legal obligation on the part of a state to adhere to or refrain from certain practices. *Opinio juris* refers to customs and habits that have gained the status of law. This occurs when states no longer feel legally free to deviate from a practice (*opinio juris sive necessitatis*). *Id.*

⁶² I. VAN LIER, *supra* note 60, at 97.

⁶³ *Id.*

⁶⁴ Constance O'Keefe, *Transboundary Pollution and the Strict Liability Issue: The Work of the International Law Commission on the Topic of International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, 18 DEN. J. INT'L L. & POL'Y 145, 162 (1990).

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ See Peters, *supra* note 55, at 78—79.

grams, coordinate research, develop training programs, and oversee global environmental monitoring efforts.⁶⁹ UNEP represents an international effort to resolve global environmental problems through assessment and information exchange. Neither the Stockholm Declaration nor UNEP proposed that the international community take affirmative action to reduce air pollution.⁷⁰

2. The 1979 Convention on Long-Range Transboundary Air Pollution

In an effort to address and control the European acid rain problem, an initiative requiring sovereign states to adopt measures to control pollution was introduced by the United Nations' Economic Commission for Europe (ECE) at the 1979 Convention on Long-Range Transboundary Air pollution held at Geneva, Switzerland.⁷¹ The ECE Convention elicited a commitment from sovereign states to reduce and ultimately prevent air pollution by developing systems to control air quality.⁷² The 1979 ECE Convention established joint research and cooperative programs between signatory states to monitor and address transboundary pollution problems.⁷³

The 1979 Convention was the first international agreement with a primary focus on abating pollution caused by acid rain.⁷⁴ In 1985 a majority of the ECE states signed a protocol requiring a thirty percent reduction in sulfur dioxide emissions.⁷⁵ The Convention adopted a second protocol limiting nitrogen oxide emissions in 1988.⁷⁶ Yet, the 1979 Convention and its protocols are "soft" law documents that lack binding force. While the ECE Convention and its subsequent protocols establish limits on pollution levels no timetables or goals for reducing pollution levels were established.⁷⁷ Moreover, the Convention sought to balance the political, economical, and social interests of states with dissimilar levels of development and geographical conditions.⁷⁸ The problems associated with balancing com-

⁶⁹ See *Id.* at 78

⁷⁰ See *Id.* at 78—79.

⁷¹ *Id.*

⁷² *Id.*

⁷³ O'Keefe, *supra* note 64, at 173.

⁷⁴ David Rubin, Note, *Acid Rain In The European Community: A Hard Rain's A-Gonna Fall*, 16 *BROOK. J. INT'L L.* 621, 627-30 (1990).

⁷⁵ *Id.* at 627—28.

⁷⁶ *Id.* at 628.

⁷⁷ *Id.* at 627.

⁷⁸ *Id.* at 628.

peting states interests can frustrate international consensus.⁷⁹ As a result, the 1979 ECE Convention failed to address adequately the European acid rain problem because the agreement does not obligate signatory states to take affirmative steps towards abating trans-boundary pollution.

B. Modern Intervention Efforts

With a spotlight on the need for a more responsible approach towards the earth's ecosystem, the international community met in Montevideo, Uruguay to identify environmental issues affecting developing nations.⁸⁰ The meeting was organized by UNEP to identify global environmental law priorities.⁸¹ Depletion of the earth's ozone layer was one of the Convention's priority concerns.⁸²

Ozone in the earth's stratosphere serves to absorb ultraviolet radiation from the sun and thus is vital to the protection of human health and maintenance of the existing biological chain.⁸³ The ozone molecule consists of three oxygen atoms.⁸⁴ Ozone molecules are destroyed when chlorine causes separation of one of the oxygen atoms.⁸⁵ Chlorine is released into the atmosphere when chlorofluorocarbons used in aerosols disintegrate.⁸⁶ Scientists first discovered a hole in the ozone layer over Antarctica in 1985.⁸⁷ Since 1985 the hole has expanded and, in 1987, scientists estimated the hole to be the size of the continental United States.⁸⁸ The rapid depletion of the ozone layer was the impetus for an international agreement specifically addressing the international community's shared responsibility for the earth's environment.⁸⁹

1. The Vienna Convention

The Vienna Convention for the Protection of the Ozone Layer was an outgrowth of the 1981 meeting in Uruguay to identify significant

⁷⁹ SPRINGER, *supra* note 41, at 32.

⁸⁰ Peters, *supra* note 55, at 79-80.

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.* at 79-81.

⁸⁴ *Id.* at 79.

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ *Id.* at 80.

⁸⁸ *Id.*

⁸⁹ *Id.*

global environmental concerns.⁹⁰ The Convention, using the Stockholm Declaration as the nucleus, established a framework for exchanging scientific and technical information, conducting cooperative research activities, and monitoring pollution with respect to the ozone layer.⁹¹ The Convention, signed by sixty states including the United States and Canada, provided a procedure for adopting protocols and created a mechanism for mediating disputes concerning the interpretation of the Convention.⁹² The Vienna Convention focused global attention on a documented environmental issue of major significance and universal impact.⁹³

While the Vienna Convention provided a process for developing methods to control depletion of the ozone layer the Convention did not establish goals or timetables for achieving changes.⁹⁴ Like previous international environmental agreements, the Vienna Convention was a "soft" law document because the Convention imposed only general obligations upon signatory states.⁹⁵ Nevertheless, the Vienna Convention focused global attention on the ozone layer and reminded the international community that the earth has just one environment.⁹⁶ The Convention also led the way for the Montreal Protocol.

2. Montreal Protocol

Shortly after the Vienna Convention, fifty-six members of the United Nations, including the United States and Canada, gathered in Montreal to negotiate the terms of the Protocol on Substances that Deplete the Ozone Layer.⁹⁷ The Montreal Protocol obligated signatory nations initially to limit production of specific ozone depleting substances to a level not exceeding ten percent of the state's 1986 production rate.⁹⁸ Signatories to the Montreal Protocol agreed to calculate their level of consumption of specified controlled substances on a twelve month basis in order to establish the level at

⁹⁰ *Id.* See also Vienna Convention for the Protection of the Ozone Layer, March 22, 1985, 26 I.L.M. 1516 (1987).

⁹¹ Peters, *supra* note 55, at 80.

⁹² *Id.* at 80-81.

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.* at 81. Montreal Protocol on Substances that Deplete the Ozone Layer, 26 I.L.M. 1541 (1987), 52 Fed. Reg. 47,489, was signed by the United States and Canada. *Id.* at 81 n.105.

⁹⁸ Peters, *supra* note 55, at 81-82.

which they must freeze, and eventually reduce, chlorofluorocarbon emission.⁹⁹ The Montreal Protocol established guidelines and timetables for reducing and eventually eliminating emission of ozone-depleting substances.¹⁰⁰ Under the Protocol, developing nations have the ability to delay compliance with established control measures provided the annual calculated level of production of the controlled substance in the country does not exceed 0.3 kilograms per capita.¹⁰¹

In that the Montreal Protocol imposes specific duties on signatory states to gradually decrease ozone-depleting substances and provides for development of enforcement mechanisms to promote compliance, the Protocol has the force and effect of law. The Montreal Protocol is significant to the development of international environmental law in that it was the first international agreement to impose specific obligations on the signatory states to limit production of substances that are harmful to the environment.¹⁰² Besides representing the first "hard" law in the area, the Montreal Protocol represents the first prospective effort to address a worldwide environmental threat by imposing strict pollution controls.¹⁰³

The Montreal Protocol affirmed the role of traditional international law in bringing about solutions to transboundary pollution problems.¹⁰⁴ Analogously, the North American acid rain problem can be resolved through application of international environmental law. The Montreal Protocol provides a model of the type of agreement the United States and Canada must reach to abate the acid rain problem confronting the two nations. While this task is difficult it is not insuperable. The United States and Canada have entered agreements to resolve pollution problems in the past. Most notable are the 1972 and 1978 Great Lakes Water Quality Agreements.¹⁰⁵ On the other hand, many of the issues presented by the acid rain debate

⁹⁹ Montreal Protocol on Substances that Deplete the Ozone Layer, *supra* note 97, Art. 2(1) at 1552.

¹⁰⁰ Peters, *supra* note 55, at 81-82.

¹⁰¹ *Id.*

¹⁰² Roberta Dohse, Comment, *Global Air Pollution and the Greenhouse Effect: Can International Legal Structures Meet the Challenge?*, 13 HOUS. J. INT'L L. 179, 202-03 (1990).

¹⁰³ Ved P. Nanda, *Trends in International Environmental Law*, 20 CAL. W. INT'L L.J. 187, 192-94 (1989-1990).

¹⁰⁴ *Id.* On May 2, 1989 eighty nations signed the Helsinki Declaration on the Protection of the Ozone Layer, 28 I.L.M. 1335 (1989), expressing an intent to cooperate in research, to exchange information and to assist developing nations with costs associated with abatement procedures. Nanda, *supra* note 103, at 202.

¹⁰⁵ See 1972 Great Lakes Water Quality Agreement, Apr. 15, 1972, U.S.-Can., 23 U.S.T. 301, and Great Lakes Water Quality Agreement of 1978, Nov. 22, 1978, U.S.-Can., 30 U.S.T. 1383.

have sparked strong emotional reaction, in the United States and Canada, which has delayed and complicated resolution of transboundary air pollution between the two countries.

IV. ACID RAIN'S EFFECT ON UNITED STATES AND CANADIAN RELATIONS

The United States and Canada have developed a tradition of resolving disputes without resorting to the use of force.¹⁰⁶ As neighbors, they share a boundary of 5000 miles which passes through heavily industrialized and highly populated areas.¹⁰⁷ Despite the number of cultural, economic and political issues that arise as a result of their proximity, Canada and the United States have maintained cordial relations as well as an unfortified border since the mid-nineteenth century.¹⁰⁸

Even though the United States and Canada are both federal nations, there is an immense difference in the autonomy these federal governments grant to their states and provinces with respect to environmental issues.¹⁰⁹ Both governments provide for shared responsibility of matters affecting the environment.¹¹⁰ Yet, while Congress clearly has authority to enact environmental legislation, the scope of Parliament's regulatory authority is not as clear.¹¹¹ Under the Canadian Constitution, the federal government may preempt provincial rule only "for the general advantage of Canada."¹¹² Further, Canada's federal regulatory powers with respect to environmental legislation are limited to those matters extending beyond provincial interests which are inherently of concern to the Dominion.¹¹³ Consequently, the provinces argue that environmental legislation that regulates activities wholly within their boundaries exceeds the scope of federal authority.¹¹⁴ Hence, although Parliament passed a Clean Air Act similar to that enacted by Congress, which withstood provincial challenge, the Canadian government uses its

¹⁰⁶ VAN LIER, *supra* note 60, at 172-174.

¹⁰⁷ *Id.*

¹⁰⁸ Erik K. Moller, Comment, *The United States-Canadian Acid Rain Crisis: Proposal For An International Agreement*, 36 UCLA L. REV. 1207, 1207 (1989).

¹⁰⁹ Alastair R. Lucas, *Acid Rain: The Canadian Position*, 32 U. KAN. L. REV. 165, 172 (1983).

¹¹⁰ *Id.*

¹¹¹ Moller, *supra* note 108, at 1213 n.40.

¹¹² Lucas, *supra* note 109, at 172.

¹¹³ *Id.* at 173.

¹¹⁴ *Id.*

preemptive power sparingly in the interest of maintaining amiable federal-provincial relations.¹¹⁵

Besides enacting individual domestic air pollution measures, the United States and Canada committed to engage in joint research to resolve the acid rain problem under the 1980 Memorandum of Intent.¹¹⁶ A group of concerned Americans even initiated litigation in an attempt to gain relief for themselves, and for Canadians from the ravages of acid rain.¹¹⁷ While none of these efforts were successful they laid the foundation for a 1991 agreement which promises to hold the answers to resolving the long-standing problem of acid rain between the United States and Canada.

A. A Look At Past Relations

Lakes Erie, Huron, Ontario, Superior and well over a hundred lesser lakes and rivers form part of the water boundary between Canada and the United States.¹¹⁸ With this large aqueous boundary, the United States and Canada have established formal methods of developing and managing their shared water resources.¹¹⁹ The most notable of these systems is the International Joint Commission (IJC) which was created by the 1909 Boundary Waters Treaty.¹²⁰ Originally drafted by the United States and Canada to resolve navigation disputes and issues concerning diversion and use of waters, the Boundary Waters Treaty contains a reciprocity provision granting aggrieved parties access to the courts of the country wherein the incident giving rise to the dispute occurred.¹²¹ Over the years, the IJC's responsibilities have extended to air and water pollution matters.¹²²

The Boundary Waters Treaty reserved to Canada and the United States the exclusive right to control waters within their respective territories.¹²³ Management of the waters bisected by the international boundary between the two countries was delegated to the

¹¹⁵ *Id.*

¹¹⁶ Garland, *supra* note 17, at 1-3.

¹¹⁷ *Id.*

¹¹⁸ Joel A. Gallob, *Birth Of The North American Transboundary Environmental Plaintiff: Transboundary Pollution And The 1979 Draft Treaty For Equal Access And Remedy*, 15 HARV. ENVTL. L. REV. 85, 112-16 (1991).

¹¹⁹ *Id.*

¹²⁰ *Id.* The Boundary Waters Treaty, 36 Stat. 2448, T.S. No. 548, was signed Jan. 11, 1909 by the United Kingdom (on Canada's behalf) and the United States. *Id.* at 112, n.137.

¹²¹ *Id.* at 112-15.

¹²² *Id.*

¹²³ *Id.*

IJC.¹²⁴ The IJC is a six member body with the United States and Canada each appointing three members.¹²⁵ Although the IJC engages primarily in technical work, the Commission has authority to resolve water disputes submitted by both nations and to make recommendations concerning diversions, obstructions and new uses of waters bisected by the international boundary between the United States and Canada.¹²⁶ IJC recommendations concerning pollution-related matters carry less weight than those concerning water diversions and are not binding on the parties.¹²⁷ While the 1909 Boundary Waters Treaty grants the IJC binding authority over water diversions and obstructions, the Treaty does not confer enforcement power on the Commission with respect to pollution of boundary waters.¹²⁸ Nevertheless, the IJC has played a significant role in addressing pollution problems between the two nations.¹²⁹ In fact, the United States and Canada called upon the IJC to resolve a transboundary air pollution complaint against a smelter in Trail, British Columbia shortly after the Commission was created.

The effects of burning high sulfur coal in North America began to appear during the 1890s when farms surrounding a smelter in Northport, Washington reported property damage related to smoke.¹³⁰ Parties apparently resolved disputes locally.¹³¹ A second smelter was constructed in 1896, across the border from Washington in Trail, British Columbia.¹³² Although the new smelter had smoke stacks over 400 feet high, its emissions still caused significant damage to property in Washington.¹³³ Washington residents filed a formal complaint against the Canadian owners of the Trail smelter in 1926.¹³⁴ While the parties settled the initial claims, damage from the smelter continued to accrue.¹³⁵ By 1931, the IJC had become involved in the transboundary air pollution dispute.¹³⁶

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ *Id.*

¹²⁹ *Id.* at 116-18. For an example of the breadth of the IJC's involvement in pollution matters, see generally, David K. W. Wilson, Jr., *Cabin Creek and International Law—An Overview*, 5 PUB. LAND L. REV. 110 (1984).

¹³⁰ See Alfred P. Rubin, *Pollution by Analogy: The Trail Smelter Arbitration*, 50 OR. L. REV. 259, 259-60 (1971).

¹³¹ See *id.*

¹³² *Id.* at 260.

¹³³ See *id.*

¹³⁴ *Id.*

¹³⁵ See *id.*

¹³⁶ See *id.*

The IJC's first report in 1931 fixed current damages at \$350,000.¹³⁷ The Commission ordered the owners of the Trail smelter to pay the damages that had accrued, with future damages to be assessed later.¹³⁸ By 1935, the United States and Canada agreed to submit the matter to arbitration because the two countries had not yet determined future damages.¹³⁹ The United States and Canada asked the arbitral panel to determine, *inter alia*, whether the smelter at Trail should be restrained from causing further damage in Washington.¹⁴⁰ In its report, the arbitral panel stated that under international law a state could not use or permit the use of its territory in such a manner as to cause injury by fumes to the territory of another state or to the properties or persons therein.¹⁴¹

While Trail Smelter is known for its restatement of the basic international principle of "good neighborliness"¹⁴²—also referred to as the *sic utere* doctrine—it made other contributions to international environmental law.¹⁴³ Of special note, the Trail Smelter arbitral panel established a pollution control regime which fixed maximum emissions levels for the smelter.¹⁴⁴ Additionally, the Trail Smelter arbitration represents the earliest effort by an international tribunal to resolve a transboundary pollution problem.¹⁴⁵ The Trail Smelter arbitration also marked the beginning of what would become a long-term debate between the United States and Canada over transboundary air pollution.

B. *The Present State of Affairs*

SO₂ emissions in North America can be attributed primarily to coal-burning power plants and smelters.¹⁴⁶ The Ohio River Valley emits the greatest amount of acid-producing gases in the United States.¹⁴⁷ The primary source of SO₂ emissions in Canada are coal-

¹³⁷ *See id.*

¹³⁸ *Id.*

¹³⁹ *See id.*

¹⁴⁰ *Id.* at 260, 262.

¹⁴¹ *Id.* at 267 (quoting Convention for Settlement of Difficulties Arising from Operation of Smelter at Trail, B.C. (U.S. v. Can.), 3 R. Int'l Arb. Awards 1905, 1965 (1941)).

¹⁴² VAN LIER, *supra* note 60, at 108–109.

¹⁴³ *Id.* at 108 (*sic utere tuo ut alienum non laedas*, loosely translates into "so, exercise your right in such a manner as not to injure others").

¹⁴⁴ Gallob, *supra* note 118, at 120–21.

¹⁴⁵ CALDWELL, *supra* note 40, at 105.

¹⁴⁶ Garland, *supra* note 17, at 4–6.

¹⁴⁷ *Id.* at 4.

burning smelters, particularly those located east of the Manitoba/Saskatchewan border.¹⁴⁸

Transboundary pollution travels both ways between the United States and Canada.¹⁴⁹ Canada, however, is far more vulnerable than the United States to damage caused by acid deposition.¹⁵⁰ Besides enormous regions of extremely acid-sensitive spruce-fir forests, Canada's geology offers little protection from acidification.¹⁵¹ Some areas in southeastern Canada lack certain compounds such as carbonates and bicarbonates of calcium and potassium which are helpful in neutralizing the incoming acids.¹⁵² This absence of buffering quality renders Canadian lakes and rivers more susceptible to acidification.¹⁵³ In contrast, the United States is geologically well protected, having relatively few regions—Wisconsin, Minnesota, New York and the New England states—which are vulnerable to damage from acid rain.¹⁵⁴

Not only is Canada more vulnerable than the United States to acid rain damage, it is also in a downwind position. Thus, Canada receives far more transboundary air pollution from the United States than it exports.¹⁵⁵ More than fifty percent of the air pollution in Canada originates in the United States.¹⁵⁶ Canadian sources generate less than twenty percent of the United States' total acid deposition.¹⁵⁷ For these reasons, it is not surprising that Canada is the complainant in the modern-day acid rain dispute.¹⁵⁸

1. 1980 Memorandum of Intent

Responding to the heightened interest of their constituents in transboundary air pollution issues, the United States and Canada

¹⁴⁸ *Id.* Ontario and Quebec Provinces contribute more than half the SO₂ produced in eastern Canada. *Id.*

¹⁴⁹ John E. Carroll, *The Acid Rain Issue in Canadian American Relations: A Commentary*, in INTERNATIONAL ENVIRONMENTAL DIPLOMACY: THE MANAGEMENT AND RESOLUTION OF TRANSFRONTIER ENVIRONMENTAL PROBLEMS 141-46 (J. Carroll ed., 1988) [hereinafter INTERNATIONAL ENVIRONMENTAL DIPLOMACY].

¹⁵⁰ *Id.* Geologically, Canada's foundation is primarily granitic shield bedrock which provides poor buffering protection from additional acid deposition. *Id.*

¹⁵¹ *Id.* at 141-42.

¹⁵² CECIE STARR & RALPH TAGGART, BIOLOGY: THE UNITY AND DIVERSITY OF LIFE 738 (4th ed. 1987).

¹⁵³ *Id.*

¹⁵⁴ Carroll, *supra* note 149, at 142.

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

established a bilateral research consultation group in 1978 to study the issue of long-range transport of air pollutants.¹⁵⁹ The group's report set the stage for further negotiations between the parties with the aim of developing a strategy to protect the environment from transboundary air pollution.¹⁶⁰ In 1979, the United States and Canada issued a Joint Statement on Transboundary Air Quality¹⁶¹ which paved the way for the 1980 Memorandum of Intent between the Governments of the United States and Canada Concerning Transboundary Air Pollution.¹⁶²

While the 1980 Memorandum of Intent represents "soft" law in that it does not impose binding legal obligations on the parties, a number of the Memorandum's accomplishments are noteworthy. For example, the 1980 Memorandum refers to the 1979 ECE Convention on Long-Range Transboundary Air Pollution and the 1972 Stockholm Declaration reinforcing their status as *opinio juris*.¹⁶³ Further, the Memorandum includes, for the first time, the term "acid rain" as a particular element of transboundary air pollution.¹⁶⁴ Also, the document provides for joint study groups to develop strategies for reducing air pollution, assess the cost and impact of implementing proposed abatement processes, conduct atmospheric modelling, and draft documents to present the groups findings.¹⁶⁵ A bilateral oversight committee was created to coordinate the groups' work efforts and undertake preparatory discussions to formal negotiations for an agreement on transboundary air pollution.¹⁶⁶ Equally important, the 1980 Memorandum evinces a commitment on the part of both parties to develop a bilateral agreement to combat transboundary air pollution.¹⁶⁷ In the interim the parties pledged to take actions to address pollution while negotiating the agreement.¹⁶⁸

The Memorandum work groups concluded their work in the early 1980s.¹⁶⁹ Negotiations for a bilateral agreement began shortly there-

¹⁵⁹ Scott A. Hajost, *Introduction: A Symposium on Acid Rain*, 17 U. TOL. L. REV. 107, 108 (1985).

¹⁶⁰ *Id.* at 108-09.

¹⁶¹ Moller, *supra* note 108, at 1211. *See also*, 1979 Joint Statement on Transboundary Air Quality Talks, *reprinted in* DEP'T ST. BULL., Nov. 26, 1979, at 26.

¹⁶² Memorandum of Intent Concerning Transboundary Air Pollution, Aug. 5, 1980, U.S.-Can., 32 U.S.T. 2521.

¹⁶³ *Id.* at 2521.

¹⁶⁴ *Id.* at 2524.

¹⁶⁵ *Id.* at 2529.

¹⁶⁶ *Id.* at 2525.

¹⁶⁷ *Id.* at 2524.

¹⁶⁸ *Id.*

¹⁶⁹ Hajost, *supra* note 159, at 108.

after.¹⁷⁰ As an interim action, the United States and Canada agreed to develop domestic policies and strategies for abating air pollution.¹⁷¹ Further, the nations agreed to exchange information on their individual programs to study the effects of acid rain on the ecosystem.¹⁷² Finally, the United States and Canada agreed to continue cooperative efforts involving advance notification of actions which might have a significant environmental impact with respect to air pollution.¹⁷³

2. Domestic Air Pollution Controls

Both the United States and Canada have enacted Clean Air Acts which set standards for air quality.¹⁷⁴ The Canadian Clean Air Act, however, is vastly different from the United States' Clean Air Act primarily because Canada has only six smelters and one utility as pollution sources.¹⁷⁵ Accordingly, Canada's Clean Air Act does not establish emissions standards comparable to those of the U.S. Clean Air Act.¹⁷⁶ Rather, the Canadian Clean Air Act sets guidelines for air quality and reserves to the provinces the method(s) of achieving and enforcing the federally instituted goals.¹⁷⁷ It should be noted, however, that the 1971 Canadian Clean Air Act does establish maximum emissions levels beyond which plants may not operate.¹⁷⁸

In contrast, there are large number of pollution sources in the United States.¹⁷⁹ While the United States government enacted legislation to address the issue of air pollution as early as 1963, the United States did not pass a comprehensive Clean Air Act until 1970.¹⁸⁰ At the same time, the United States government created the Environmental Protection Agency (EPA) to regulate pollution activity.¹⁸¹ Under the EPA's authority, the 1970 U.S. Clean Air

¹⁷⁰ *Id.*

¹⁷¹ MARIAN NASH LEICH, *DIGEST OF UNITED STATES PRACTICE IN INTERNATIONAL LAW* 899-900 (1980).

¹⁷² *Id.*

¹⁷³ *Id.*

¹⁷⁴ Sydney G. Harris, *Canadian Positions, Proposals, and the Diplomatic Dilemma: Acid Rain and Emerging International Norms*, 17 *U. TOL. L. REV.* 121, 126 (1985).

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

¹⁷⁷ *Id.*

¹⁷⁸ *Id.* at 125-26.

¹⁷⁹ *Id.*

¹⁸⁰ GOVERNMENT INSTITUTES, INC., *ENVIRONMENTAL LAW HANDBOOK* 259 n.1 (10th ed. 1989).

¹⁸¹ *Id.*

Act,¹⁸² and subsequent amendments, vest a great deal more power in the federal government than does its Canadian counterpart.¹⁸³ Most notable is the federal government's authority to establish air quality standards for certain regions of the country designated as Prevention of Significant Deterioration Zones (PSDs).¹⁸⁴ Also worthy of mention is the federal government's power to establish standards for future pollution sources.¹⁸⁵

Under the U.S. Clean Air Act, state governments have the responsibility for administering and enforcing air quality standards promulgated by the EPA.¹⁸⁶ To this end, states must submit a State Implementation Plan (SIP) to the EPA for approval.¹⁸⁷ SIPs must detail how air quality standards will be met by preventing emissions from exceeding maximum pollution levels established by the EPA.¹⁸⁸ If a SIP is not stringent enough to achieve air quality standards, the EPA may require the state to revise its plan.¹⁸⁹ Under the United States Clean Air Act administrative powers are vested in the states while the federal government retains rule-making authority.¹⁹⁰

When Congress enacted the 1965 amendments to the 1963 Clean Air Act, the legislature included, under section 102, language which could arguably be construed as providing aggrieved foreign states with a means of addressing transboundary air pollution originating from the United States.¹⁹¹ The language of section 102 and the legislative history, however, fail to explain the conditions for obtaining relief.¹⁹² Through amendments to the Clean Air Act in 1977, Congress clarified its intentions.¹⁹³ Section 115 of the amended Act provided, in part, that if the EPA Administrator received notice from an international agency that pollution originating from the United States endangered the public welfare of a foreign country, the Administrator must require the offending state(s) to submit a

¹⁸² 42 U.S.C. §§ 7401-7642 (1982).

¹⁸³ Moller, *supra* note 108, at 1215.

¹⁸⁴ *Id.* at 1215 n.49.

¹⁸⁵ *See id.* at 1215.

¹⁸⁶ *Id.*

¹⁸⁷ Schwartz, *supra* note 22, at 375 n.79.

¹⁸⁸ *Id.*

¹⁸⁹ *Id.*

¹⁹⁰ Moller, *supra* note 108, at 1215.

¹⁹¹ John L. Sullivan, Note, *Beyond The Bargaining Table: Canada's Use Of Section 115 Of The United States Clean Air Act To Prevent Acid Rain*, 16 CORNELL INT'L L.J. 193, 208, n.89 (1983).

¹⁹² *Id.*

¹⁹³ *Id.* at 209-11.

revised SIP addressing the problem.¹⁹⁴ In order to trigger this section of the Act, the injured foreign state must have provided the United States with reciprocal rights.¹⁹⁵

In early 1981, EPA Administrator Douglas M. Costle publicly announced that "acid deposition is endangering public welfare in the United States and Canada . . . U.S. and Canadian sources contribute to the problem not only in the country where they are located but also in the neighboring country."¹⁹⁶ Costle stated that he based his findings on a report issued by the IJC.¹⁹⁷ A few years later, four environmental groups, four individual United States citizens with land in Canada, and six states armed with Costle's announcement filed suit in the United States District Court for the District of Columbia, to compel current EPA Administrator, Lee M. Thomas, to invoke the provisions of section 115 of the Clean Air Act and order any states contributing to Canada's air pollution to revise their SIPs.¹⁹⁸

3. An Appeal for Judicial Relief

In *New York v. Thomas*, after determining that it had jurisdiction to hear the complaint and that the states, environmental associations and individuals bringing the action had standing, the court proceeded to the merits of the case.¹⁹⁹ The court determined the issue to be whether the litigants had satisfied the requirements of section 115 and, if so, what action the statute required the Administrator to take.²⁰⁰ Upon examination of the language in section 115, the court

¹⁹⁴ *Id.* at 209.

¹⁹⁵ *Id.* at 209-11.

¹⁹⁶ Letter from Douglas Costle, Administrator of the E.P.A., to Edmund Muskie, Secretary of State (Jan. 13, 1981), reprinted in *New York v. Thomas*, 613 F.Supp. 1472, 1488 (D.D.C. 1985), *rev'd*, 802 F.2d 1443 (D.C. Cir. 1986).

¹⁹⁷ *Id.* at 1476.

¹⁹⁸ *Id.*

¹⁹⁹ *Id.* at 1479-81.

²⁰⁰ *Id.* at 1481-82.

(a) Whenever the Administrator, upon receipt of reports, surveys or studies from any duly constituted international agency has reason to believe that any pollutant or pollutants emitted in the United States cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country or whenever the Secretary of State requests him to do so with respect to such pollution which the Secretary of State alleges is of such a nature, the Administrator shall give formal notification thereof to the Governor of the State in which such emissions originate.

(b) The notice of the Administrator shall be deemed to be a finding under section 7401(a)(2)(H)(ii) of this title which requires a plan revision with respect to so much

held that in order to invoke the provisions of section 115 the Administrator only need have "reason to believe that any air pollutant or pollutants emitted in the United States cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country."²⁰¹ Further, the court found that the IJC report upon which Administrator Costle based his findings, constituted a report from an international agency sufficient to support a reasonable conclusion that pollutants from the United States endangered health and public welfare in Canada.²⁰²

As to the reciprocity requirements of section 115, the court found that the Canadian legislature had enacted a statute with similar language.²⁰³ Under the Canadian Clean Air Act, the Minister of Environment was required to recommend emissions standards to abate pollution when confronted with "reason to believe that Canadian contaminants contribute to air pollution which may reasonably be expected to constitute a significant danger to the health, safety, or welfare of persons in another country."²⁰⁴ Moreover, in order to remedy transboundary pollution, the Canadian legislation conferred upon the Minister of Environment the duty of consulting with provinces believed to be the source of the pollutants.²⁰⁵ The court found this consultation similar to the EPA requiring a state to revise its SIP.²⁰⁶ After concluding that EPA Administrator Costle had sufficient justification in 1981 to invoke section 115, the court acknowledged that there may be a need to review present circumstances.²⁰⁷

Next, the court proceeded to examine the question of what action the EPA Administrator must take, once the provisions of section 115 are met.²⁰⁸ The Clean Air Act then compels the EPA Adminis-

of the applicable implementation plan as is inadequate to prevent or eliminate the endangerment referred to in subsection (a) of this section. Any foreign country so affected by such emission of pollutant or pollutants shall be invited to appear at any public hearing associated with any revision of the appropriate portion of the applicable implementation plan.

(c) This section shall apply only to a foreign country which the Administrator determines has given 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. 42 U.S.C. § 7415(a)-(e)(1982).

²⁰¹ *Id.* at 1482.

²⁰² *New York v. Thomas*, 613 F.Supp. at 1482-83.

²⁰³ *See id.* at 1483.

²⁰⁴ *Id.*

²⁰⁵ *Id.*

²⁰⁶ *See id.*

²⁰⁷ *Id.* at 1483-84.

²⁰⁸ *Id.* at 1484.

trator to commence the process of requiring offending states to revise their respective SIPs.²⁰⁹ Consequently, the court ordered EPA Administrator Thomas to provide the required notice to the Governors of the states responsible for the conditions revealed in the IJC report made public by Administrator Costle in 1981.²¹⁰

On appeal, the United States Court of Appeals for the District of Columbia reversed the district court's decision in *Thomas*.²¹¹ In the court's decision, written by Circuit Judge Scalia, the appeals court described the case as involving "an unusual statute executed in an unexpected manner."²¹² Finding it unnecessary to address the merits of the case because administrative rule-making procedures were not adhered to, the appeals court concluded that Costle's findings could not serve as the basis for the judicial relief sought by the plaintiffs.²¹³ Thus, the circuit court never established conclusively whether section 115 of the Clean Air Act could serve as a means of resolving transboundary air pollution issues.²¹⁴

Many scholars advocate a municipal law approach similar to *Thomas* to address the issues raised by acid rain despite the international nature of transboundary air pollution.²¹⁵ While *Thomas* was pending appeal, the plaintiffs' lead counsel prepared an eloquent discourse outlining the reasons why the Canadian government should join in any future litigation of the case.²¹⁶ While this approach is not without some merit, it presents complex questions from an international law perspective including whether becoming entangled in a foreign state's domestic affairs is good diplomatic policy.

²⁰⁹ *Id.*

²¹⁰ *Id.* at 1486.

²¹¹ *Thomas v. New York*, 802 F.2d 1443, 1448 (D.C. Cir., 1986).

²¹² *Id.* at 1446.

²¹³ *Id.* at 1446-48.

²¹⁴ *Id.* at 1448.

²¹⁵ See generally, Sanford E. Gaines, *International Principles for Transnational Environmental Liability: Can Developments in Municipal Law Help Break the Impasse?*, 30 HARV. INT'L L.J. 311 (1989) (suggesting that general liability principles of municipal law, when applied to issues involving transboundary pollution, will encourage reduction in environmental damage and facilitate development of theoretical environmental liability and compensation limits); cf. Garland, *supra* note 17, at 36-37 (proposing that state and provincial legislation be used to bridge the gap created by the decision in *Thomas v. New York*).

²¹⁶ See David R. Wooley, *Acid Rain: Canadian Litigation Options in U.S. Court and Agency Proceedings*, 17 U. TOL. L. REV. 139 (1985). David R. Wooley was Assistant-Attorney General for the State of New York and represented the States of New York, Maine, Connecticut, Vermont, New Hampshire and Rhode Island, the National Audubon Society, National Wildlife Federation, Sierra Club, Natural Resources Defense Council, three U.S. citizens owning land in Canada's Muskoka Lakes area, and then New York Congressman Richard Ottinger in their suit against the EPA. *Id.* at 139, n.1.

Notwithstanding the question of sovereignty, Canada's intervention in the American legal system could possibly ignite similar action by the United States under the reciprocity provisions of the Canadian Clean Air Act. More important, by accepting the jurisdiction of the United States court system in the *Thomas* case, Canada would waive any immunity afforded by the act of state²¹⁷ and sovereign immunity doctrines against counterclaims for damages caused in the United States by Canadian pollutants.²¹⁸ These two possibilities are sufficient to make application of municipal law a less than desirable dispute resolution mechanism for addressing transboundary air pollution.

While the Canadian government elected not to intervene in *New York v. Thomas*, the Canadian government did prepare an amicus brief and requested that the State Department present the brief to the court.²¹⁹ The State Department refused to grant the request.²²⁰ The State Department's refusal suggests that Canadian involvement was unwelcome. Not wanting to infringe on United States sovereignty, Canada may have declined to intervene in the *Thomas* appeal for diplomatic reasons. Regardless, the Canadian national government chose not to participate in the *Thomas* appeal and the circuit court's decision was reversed on procedural rather than substantive grounds. Thus, the issue of transboundary air pollution between the two countries remained unresolved.

C. A Bilateral View of the Issues

Historically, relations between the United States and Canada have been cordial, evincing a large degree of comity. In the past, the two countries have applied the principle of good neighborliness to resolve environmental issues.²²¹ The acid rain problem, however, raises issues which impinge upon the concept of territoriality.²²² Further, abatement of transboundary air pollution will require examination

²¹⁷ See generally, United States Foreign Sovereign Immunities Act of 1976, 28 U.S.C. § 1607(b)(1988); *First Nat'l City Bank v. Banco Nacional de Cuba*, 406 U.S. 759, 768 (act of state doctrine should not be applied by court when Executive Branch expressly indicates that such application would not advance American foreign policy interests)(1972).

²¹⁸ See, Foreign Sovereign Immunities Act of 1976, 28 U.S.C. § 1607(b), reprinted in CARTER & TRIMBLE, *INTERNATIONAL LAW: SELECTED DOCUMENTS* 579, *supra* note 54, at 579.

²¹⁹ Wooley, *supra* note 216, at 140, n.2.

²²⁰ *Id.*

²²¹ Anthony Scott, *The Canadian-American Problem of Acid Rain*, 26 NAT. RESOURCES J. 337, 337 (1986).

²²² *Id.* at 337-38.

of the principles of absolute sovereignty and external liability.²²³ While the United States and Canada have resolved disputes involving territoriality and reached agreement on sovereignty issues associated with marine areas, past negotiations never reached the level required for preliminary discussions to begin on resolving the problems of acid rain.²²⁴ The complications inherent in achieving a balance between independence and interference, the required equilibrium for resolving transboundary air pollution, can have devastating effects on even the most congenial relations.

Considering the difficulty of the task, it is not astonishing that the United States and Canada suspended negotiations for a bilateral agreement on transboundary air pollution, which the United States and Canada committed to establish under the 1980 Memorandum of Intent, shortly after negotiations were initiated.²²⁵ One reason for the breakdown in talks may be the differences in the Carter and Reagan Administrations' priorities.²²⁶ While environmental concerns were of top priority to the Carter Administration, the Reagan Administration insisted on greater proof that acid rain was an environmental menace worthy of the expense necessary to abate the problem.²²⁷ Canada did not receive this wait-and-see attitude of the Reagan Administration very well.²²⁸

1. Canada's Perspective

Canada recognized acid rain as a major environmental hazard during the 1970s.²²⁹ Since that time, federal and provincial governments have taken steps to reduce domestic emissions.²³⁰ The Canadian utility, Ontario Hydro, has experimented with technologies designed to reduce SO₂ emissions and has future plans to switch from coal to nuclear-powered electricity generation.²³¹ Smelters have reduced emissions by equipping plants with devices that capture sulfurous gases before they escape into the air.²³² Canada realized,

²²³ *Id.* at 338.

²²⁴ *Id.* at 337-38.

²²⁵ Hajost, *supra* note 159, at 108.

²²⁶ *Id.* at 108-09.

²²⁷ Sullivan, *supra* note 191, at 202-03.

²²⁸ *Id.* at 203.

²²⁹ *Id.* at 202-03.

²³⁰ *Id.*

²³¹ Harris, *supra* note 174, at 126-27.

²³² *Id.* The devices capture SO₂ before the chemical enters the air and manufactures sulfuric acid. KOTZ & PURCELL, *supra* note 16, at 846-47. Approximately 40 million tons of sulfuric

however, that the ultimate solution to the acid rain problem required United States commitment to a joint effort to improve air quality.²³³ Understandably, the Canadians viewed the Memorandum of Intent as a significant step towards addressing the air pollution problem between the two nations.²³⁴

The Reagan Administration's position that more research on the effects of acid rain was necessary before meaningful abatement strategies could be undertaken infuriated Canada.²³⁵ In response, the Canadian government launched a public awareness campaign designed to raise the consciousness of both American and Canadian citizens with respect to the effects of acid deposition on the earth's ecosystem.²³⁶ Canada's willingness to engage in public debate in the United States over the damage caused by acid rain is a clear indication of the seriousness and depth of the Canadian government's concern over transboundary air pollution.²³⁷ The Canadian government also unilaterally undertook to reduce domestic SO₂ emissions by fifty percent by the year 1994.²³⁸

In Canada, acid rain issues represented one of the few areas where political differences did not take precedence over progress.²³⁹ Quebec, considered the most militant of the provinces with respect to the issue of provincial powers, advocated a stronger federal posture in addressing the United States-Canadian acid rain problem.²⁴⁰ Moreover, Ontario and Quebec, galvanized by the effects of acid rain, took the unusual action of intervening in United States regulatory proceedings in an effort to block relaxation of the EPA's SO₂ emission limits.²⁴¹ Other Canadian provinces have evinced a heightened interest in overall air quality and many have enacted meaningful, and sometimes costly, environmental protection legislation.²⁴²

acid are produced annually in the United States for use in manufacturing fertilizer, treating industrial waste, and creating white pigment for use in paper, plastics, and paint. *Id.*

²³³ Harris, *supra* note 174, at 128.

²³⁴ *Id.* at 128.

²³⁵ *Id.* at 129.

²³⁶ *Id.*

²³⁷ *Id.*

²³⁸ *Id.*

²³⁹ Lucas, *supra* note 109, at 168-170.

²⁴⁰ *Id.* at 178.

²⁴¹ *Id.* at 169-170.

²⁴² Sullivan, *supra* note 191, at 215-17. For example, Ontario imposed emission restrictions on International Nickel Company, a smelting complex, requiring a reduction from 5100 tons of sulfur dioxide per day to 700 tons. Later, the Ontario government ultimately revised the limit upward to 1950 tons per day. *Id.* at 215-16.

When the Canadian Parliament revised its Clean Air Act to provide legislation reciprocal to section 115 of the United States Clean Air Act, the Canadian Parliament intended to give the United States government a tool for invoking stricter emission controls on pollutant exporting states.²⁴³ The effectiveness of the Canadian Clean Air Act and United States Clean Air Act, working in tandem to eliminate air pollution, has yet to be tested. The Canadian government, under Prime Minister Pierre Trudeau, vigorously promoted Canadian initiatives aimed towards acid rain abatement and supported proactive measures to ensure future environmental health.²⁴⁴ Trudeau's successor, Prime Minister Brian Mulroney, placed a higher priority on negotiating a bilateral free trade agreement than on transboundary air pollution problems.²⁴⁵

Prime Minister Mulroney was far less vocal than Trudeau on environmental concerns which could impede trade talks.²⁴⁶ As a result, Canada's international leadership on air pollution matters has diminished.²⁴⁷ Meanwhile, the provinces and scientific community strive to maintain the commitments and level of environmental awareness created by the Trudeau government.²⁴⁸ The proliferation of acid rain along the United States-Canadian border, however, did not diminish and, in 1986, the United States government finally admitted that the problem of acid rain was ripe for resolution.²⁴⁹

2. The American Opinion

After the work groups established under the Memorandum of Intent released their first reports in 1983, the U.S. scientists were not convinced that the environment was in imminent danger of irreparable harm as a result of acid rain.²⁵⁰ Accordingly, U.S. scientists recommended further studies before acceptance of the Canadian conclusion that a fifty percent reduction in emissions was necessary to bring sulfate pollutants to a safe level.²⁵¹ In response, Canadian

²⁴³ Commons Debates (Dec. 16, 1960) reprinted in 20 I.L.M. 762 (1981).

²⁴⁴ Carroll, *supra* note 149, at 144.

²⁴⁵ *Id.*

²⁴⁶ *Id.*

²⁴⁷ *See id.*

²⁴⁸ *Id.*

²⁴⁹ *Id.*

²⁵⁰ Lucas, *supra* note 109, at 167 (citing Impact Assessment Work Group I, United States Canada Memorandum of intent on Transboundary Air Pollution Final Report 21 (Jan. 1983)).

²⁵¹ *Id.* at 167-68. Canadian scientists determined that the environment could tolerate a maximum annual sulfate level of eighteen pounds per acre before damage would occur. *Id.* at 167.

scientists accused American scientists of manipulating facts and figures to achieve desired results and deliberately releasing ambiguous information to the public.²⁵²

Although the United States spent more than \$200 million on research, the effort failed to produce scientific evidence acceptable to the Reagan Administration proving that acid rain was responsible for the ecological decline of North American lakes and forests.²⁵³ Furthermore, because individual states were basically in compliance with the Clean Air Act, stricter controls to curb acid rain would require additional legislation which, absent credible scientific evidence of necessity, would undoubtedly fail to garner sufficient support for passage.²⁵⁴ Consequently, what Canadians perceived as the United States' lack of commitment could equally have been resignation to the fact that American industries required hard, scientific data before making costly reductions in SO₂ emissions beyond levels already in force.²⁵⁵

Unlike the period immediately following the Industrial Revolution, where the causal link between a bellowing smoke stack and local smog was obvious, the cause and effect relationship in the case of acid rain is not as clear.²⁵⁶ The use of tall smoke stacks to disperse pollutants changed the nature of proof from demonstrative to speculative in long-range transboundary air pollution issues.²⁵⁷ Consequently, investing in costly measures to alleviate acid rain, absent proof that it warrants immediate action, could be construed by Americans as poor public policy.²⁵⁸ Nevertheless, even if a "leap of faith" were required to tie midwestern states to acid rain damage, the United States was committed to reducing air pollution.²⁵⁹ This was evident when the Reagan Administration, which was somewhat indifferent to giving environmental issues priority, agreed in 1988

²⁵² *Id.* at 168. Indicative of the level of trust with respect to the motives on either side, a 1984 publication suggested that the Canadians were secretly seeking to destroy the coal industry in the midwestern United States in order to open a wider market for the export of Canadian nuclear and hydro generated electricity. See JAMES M. FRIEDMAN & MICHAEL S. MCMAHON, *THE SILENT ALLIANCE*, noted in Harris, *supra* note 174, at 130-31.

²⁵³ Green, *supra* note 46, at 136-37.

²⁵⁴ *Id.*

²⁵⁵ Michael S. McMahon, *Balancing the Interests: An Essay on the Canadian-American Acid Rain Debate*, in INTERNATIONAL ENVIRONMENTAL DIPLOMACY, *supra* note 149, at 147, 159-60.

²⁵⁶ *Id.*

²⁵⁷ *Id.*

²⁵⁸ *Id.*

²⁵⁹ *Id.*

to restrict future NO_x emissions to 1987 levels.²⁶⁰ The Reagan Administration's efforts cleared the way for progress towards a bilateral agreement specifically addressing long-range transboundary air pollution between the United States and Canada.

V. PREPARING FOR THE FUTURE

The United States' reluctance to match Canada's efforts to abate transboundary air pollution must be weighed against the United States' efforts to improve air quality prior to the formation of the so-called "30% Club."²⁶¹ For example, the United States made significant movement towards reducing transboundary pollution prior to signing the 1979 Convention on Long-Range Transboundary Air Pollution.²⁶² In fact, the United States achieved a twenty-five percent reduction in SO₂ one year before the "30% Club" was formed.²⁶³ In addition, by the turn of the century, the United States expected to realize nearly a fifty percent decrease in SO₂ emissions over 1980 levels.²⁶⁴ Still, the United States recognized that current domestic efforts did not address adequately the issue of acid rain.²⁶⁵ Accordingly, the United States sought to amend the Clean Air Act to accommodate transboundary air pollution concerns.²⁶⁶ The United States recognized that any legislative action would have to be drafted to overcome regional differences while balancing public and private sector concerns.²⁶⁷

A. 1990 United States Clean Air Act Amendments

Credit for finding a compromise solution to permit the enactment of legislation aimed directly at abating acid rain belongs to the Bush Administration, which pushed the innovative Clean Air Act Amend-

²⁶⁰ CARTER & TRIMBLE, *supra* note 61, at 150.

²⁶¹ See McMahon, *supra* note 255, at 156. The United States sought status as a "precursor" member of the "30% Club" in recognition of its efforts during the prior year. *Id.* Several signatories to the Geneva Convention on Long-Range Transboundary Air Pollution, including Canada, formed a "30% Club", by signing a protocol and pledging to reduce SO₂ emissions by thirty per cent from their 1980 levels. Armin Rosencranz, *The Acid Rain Controversy In Europe And North America: A Political Analysis*, in INTERNATIONAL ENVIRONMENTAL DIPLOMACY, *supra* note 149, at 173, 163-74.

²⁶² See McMahon, *supra* note 255, at 156.

²⁶³ *Id.*

²⁶⁴ See *id.* at 157-58.

²⁶⁵ Gallob, *supra* note 118, at 134.

²⁶⁶ *Id.*

²⁶⁷ William K. Reilly, *The New Clean Air Act: An Environmental Milestone*, 17 E.P.A. J., Jan.-Feb. 1991, at 2, 3.

ments of 1990 through Congress.²⁶⁸ The amended Act is an international model for cost-effective environmental strategies and expected to stimulate development of low-cost technologies to reduce air pollution.²⁶⁹ In addition, the Amendments call for a significant reduction of SO₂ and NO_x emissions.²⁷⁰ While past attempts to regulate SO₂ emissions covered a multitude of diverse industries, Title IV of the 1990 Amendments focuses on coal-fired power plants, the chief contributors of sulfurous gases to the atmosphere.²⁷¹ Equally important, while the Amendments establish maximum emission levels, the method of obtaining compliance is left to the discretion of the individual utility plant.²⁷²

The real innovative feature of the Clean Air Act Amendments, however, is the emissions trading program.²⁷³ Essentially, the new law creates a system under which individual power plants receive pollution allowances.²⁷⁴ Pollution allowances represent the maximum SO₂ emission level at which the power plant may legally operate.²⁷⁵ Plants reducing emissions below their allowance level may sell or trade the remainder of their pollution allowance to other utilities, emissions brokers, or any interested party.²⁷⁶ Under this program, a utility taking the initiative to reduce pollution beyond the required level could recover part of the clean-up costs by selling its unused allowance. While the EPA required continuous monitoring devices be installed in the smoke stacks of utility plants to measure emissions, ultimately responsibility for monitoring the program rests with the states.²⁷⁷

It should be noted that Congress did not expect the 1990 Amendments to address the issue of acid rain fully.²⁷⁸ Indeed, critics have described the legislation as representing "a patchwork of compromises, accommodating regional and economic interests that had defeated" prior legislative attempts.²⁷⁹ Nevertheless, it is the first effort by the United States to address the acid rain problem specifically.

²⁶⁸ See *id.*

²⁶⁹ See *id.* at 4.

²⁷⁰ Eileen Claussen, *Acid Rain: The Strategy*, 17 E.P.A. J., Jan.-Feb. 1991, at 21, 21.

²⁷¹ *Id.*

²⁷² *Id.*

²⁷³ See Elizabeth Corcoran, *Cleaning Up Coal*, SCI. AM., May 1991, at 106, 112.

²⁷⁴ *Id.*

²⁷⁵ *Id.*

²⁷⁶ *Id.*

²⁷⁷ *Id.*

²⁷⁸ See Gallob, *supra* note 118, at 135.

²⁷⁹ *Id.* at 135 (quoting Weisskopf, *Clean Air Measure Wins Hill Clearance*, WASH. POST, Oct. 28, 1990, at A16).

B. The 1991 Air Quality Agreement

Enactment of the 1990 Clean Air Act Amendments cleared the way for negotiations to commence on the bilateral agreement the United States and Canada committed to develop under the 1980 Memorandum of Intent. On March 13, 1991, less than six months after the Amendments were passed, President George Bush and Prime Minister Brian Mulroney met in Ottawa to sign the accord.²⁸⁰ At the signing ceremony, Prime Minister Mulroney emphasized the importance of the pact to Canada.²⁸¹ The Prime Minister stated that he believed the document would make possible the elimination of acid rain as an environmental threat by the year 2000.²⁸² Prime Minister Mulroney expressed appreciation for American efforts in making the accord possible.²⁸³ President Bush, after thanking all parties for their role in negotiating the agreement, pointed to the "treaty" as an indicator of the "seriousness with which both countries regard this critical environmental issue."²⁸⁴

To a large extent, the 1991 Air Quality Agreement merely reiterates existing policies and procedures between the United States and Canada regarding acid rain concerns.²⁸⁵ The document is repetitive in its call for joint research efforts and information exchange.²⁸⁶ In addition, the Agreement provides that the parties are responsible for establishing their own objectives for reducing or limiting air pollutants.²⁸⁷ Naturally, the United States selected standards identical to those achievable under Title IV of the 1990 Clean Air Act Amendments.²⁸⁸ The document also incorporates language reflecting the parties' earlier agreement to give advance notice of projects or planned actions which would have an impact on air quality.²⁸⁹

Despite the reiteration of prior understandings, the 1991 Agreement adds a new dimension to the United States-Canadian effort to address acid rain and contributes to the rapidly growing field of

²⁸⁰ Brian Mulroney and George Bush, Remarks by the President and Prime Minister Brian Mulroney of Canada at the Air Quality Agreement Signing Ceremony in Ottawa (Mar. 13, 1991), in 27 WKLY COMPILATION PRES. DOC. 298, 298.

²⁸¹ *Id.* at 299.

²⁸² *Id.*

²⁸³ *See id.* at 299.

²⁸⁴ *Id.* at 300-01.

²⁸⁵ Agreement Between the Government of the United States of America and the Government of Canada On Air Quality, Mar. 13, 1991, art. III, 2(c), Mar. 13, 1991, 30 I.L.M. 676, 679. [hereinafter Air Quality Agreement]

²⁸⁶ *Id.*

²⁸⁷ *Id.*, art. IV, at 680.

²⁸⁸ *Id.*, Annex 1, at 685.

²⁸⁹ *Id.*, art. V, at 680.

international environmental law. The Air Quality Agreement broadens the role of the IJC as party advisor on issues related to the monitoring of air pollutants.²⁹⁰ Further, the document creates a bilateral Air Quality Committee to review progress towards implementation of the Agreement's terms and provide public notice of the countries' efforts in the area of air pollution abatement.²⁹¹ The IJC is given responsibility for synthesizing public reaction to Air Quality Committee reports and for providing the countries with public feedback on their efforts.²⁹² The Agreement also establishes a mechanism for resolving disputes whereby the countries may submit any controversy arising under the document to the IJC in accordance with the applicable provisions of the 1909 Boundary Waters Treaty.²⁹³ Finally, the Agreement requires that the two countries review the terms of the document every five years.²⁹⁴

While much of the Agreement restates existing understandings between the two countries, the Agreement does cover new ground. For example, the assessment provision addresses a common criticism of taking legally binding approaches to international environmental problems—the methods are too inflexible to permit revisions based on new scientific data or technologies.²⁹⁵ By providing for regular review of the target levels for NO_x, SO₂, and the time frame for achieving the stated goals both countries can make adjustments dictated by time and new information.²⁹⁶

Clearly, the Air Quality Agreement between the United States and Canada embraces the generally accepted principle that international environmental law obligates nations to conduct activities within their jurisdiction so as not to cause environmental harm outside their territory.²⁹⁷ Further, by including target emission standards and deadlines for achieving the stated levels in Annex 1 of the Agreement, the parties have created a binding obligation.²⁹⁸ Detailing the obligations undertaken by the parties distinguishes the Air Quality Agreement from documents that are merely framework treaties—documents asserting obligations in broad terms to permit flex-

²⁹⁰ *Id.*, art. VI (2), at 681.

²⁹¹ *Id.*, art. VII.

²⁹² *Id.*, art. IX, at 682.

²⁹³ *Id.*, art. XIII, at 684.

²⁹⁴ *Id.*, art. X, at 683.

²⁹⁵ See Allen L. Springer, *U.S. Environmental Policy and International Law*, in INTERNATIONAL ENVIRONMENTAL DIPLOMACY, *supra* note 149, at 44, 60.

²⁹⁶ *Id.*

²⁹⁷ Nanda, *supra* note 103, at 198–99 (referencing Principle 21 of Stockholm Convention).

²⁹⁸ Air Quality Agreement, *supra* note 285, at 677.

ibility in application, interpretation, and enforcement.²⁹⁹ The Agreement also provides dispute resolution machinery which either nation may trigger providing for third party intervention if the countries are unsuccessful in reaching a resolution after consultations.³⁰⁰ Thus, the Agreement not only regulates the behavior of the nations, it also provides a means of enforcing the obligations the countries have agreed to undertake.

The Air Quality Agreement between the United States and Canada is distinguishable from the 1980 Memorandum of Intent in that the former is more representative of "hard" international law because it imposes binding obligations upon the parties. Indeed, the document appears to have overcome most of the impediments cited as reasons for limiting environmental agreements to non-binding expressions of general principles, such as the high costs of abatement techniques, uneven environmental impact, and political concerns.³⁰¹ Because the Canadians and Americans have successfully used the IJC to resolve boundary issues in the past, it is likely that expanding the IJC's role in transboundary air pollution disputes will hasten resolution of some of the controversies likely to arise under the Agreement. In fact, the structure of the Air Quality Agreement is very similar to that of the Great Lakes Water Quality Agreements of 1972 and 1978 which were fostered by the IJC.³⁰² Like the Air Quality Agreement, the Great Lakes Water Quality Agreements merely reiterated standards the United States was already statutorily obligated to achieve.³⁰³

On the other hand, decisions of the IJC under the dispute resolution machinery of the 1909 Boundary Waters Treaty are not binding on the parties.³⁰⁴ The Commission can only intervene in disputes with the consent of both governments, and even then the Commission is constrained to act within the authority delegated to it by the

²⁹⁹ Patricia Birnie, *The Role of International Law in Solving Certain Environmental Conflicts*, in INTERNATIONAL ENVIRONMENTAL DIPLOMACY, *supra* note 149, at 101.

³⁰⁰ Air Quality Agreement, *supra* note 285, at 677.

³⁰¹ Amy A. Fraenkel, *The Convention On Long-Range Transboundary Air Pollution: Meeting The Challenge Of International Cooperation*, 30 HARV. INT'L L.J. 447, 459 (1989).

³⁰² Sullivan, *supra* note 191, at 200-01. The 1978 Great Lakes Water Quality Agreement was the first bilateral agreement between the two parties to address transboundary air pollution. It specified that the parties would seek to develop a program to prevent air pollution from harming the Great Lakes. *Id.*

³⁰³ Compare Federal Water Pollution Control Act of 1972, Pub. L. No. 92-500, 86 Stat. 816 (1972); Marine Protection, Research and Sanctuaries Act, Pub. L. No. 92-532, 86 Stat. 1052 (1972); and 1977 Clean Water Act, Pub. L. No. 95-217, 91 Stat. 1566 (1977).

³⁰⁴ Gallob, *supra* note 118, at 114-15.

parties to the dispute.³⁰⁵ Further, even though IJC members pledge to perform their duties in an impartial manner, the members are political appointees.³⁰⁶ In order to carry out its mission the Commission depends heavily upon the services of national officials from both countries.³⁰⁷ Hence, it is most unlikely that the IJC would take a hard-line position and risk angering either country.

Nevertheless, in concluding the Agreement, President Bush referred to the document as a treaty.³⁰⁸ How the President portrays an international agreement when presenting the document to the Senate for consent or during the signing ceremony must be taken into account when determining how the United States will carry out its obligation.³⁰⁹ Therefore, the document may be perceived as having the full force and effect of a treaty. If the Air Quality Agreement is a treaty then the agreement is self-executing because there is no need for implementing legislation.³¹⁰ The agreement obligates the United States to do no more than what the United States must do under the Clean Air Act. However, even if the Agreement does not have the full force and effect of a treaty, it is still legally binding upon the United States by virtue of the statutory obligations incorporated in Annex 1 of the document.

Finally, the Air Quality Agreement contains lenient time frames for achieving emission reductions and some of the goals are unenforceable because they are so broadly written.³¹¹ While the parties have committed to a long-range environmental clean-up program, there is no provision for recognition of responsibility for damages already incurred or that may be incurred while remedial efforts are undertaken. Nevertheless, the Air Quality Agreement between the United States and Canada represents an honorable beginning to recognizing and alleviating a serious environmental problem.

VI. CONCLUSION

The Industrial Revolution was a precursor to dramatic, worldwide technological advancements and social change. As Sir Isaac Newton observed, however, for every action there is an equal op-

³⁰⁵ VAN LIER, *supra* note 60, at 181-83.

³⁰⁶ *Id.*

³⁰⁷ *Id.*

³⁰⁸ See Mulronev & Bush, *supra* note 280, at 298.

³⁰⁹ CARTER & TRIMBLE, *supra* note 61, at 150.

³¹⁰ *Id.*

³¹¹ Air Quality Agreement, *supra* note 285, at 677.

posing reaction. Acid rain is the ecosystem's reaction to the output from the billowing smoke stacks that symbolized the Industrial Revolution. Since the end of the Industrial Revolution, transboundary air pollution has received global attention. International environmental law initiatives aimed towards abatement of transboundary pollution represent one of the few areas where independent states have accepted softened definitions of sovereignty and territoriality.

The field of international environmental law has developed considerably since the beginning of the twentieth century. While international law is used primarily as a vehicle for expounding principles, particularly when addressing environmental concerns, the law can be used to resolve transboundary air pollution issues.³¹² Adherence to principles and obligations can be enforced through dispute resolution machinery.³¹³ Further, the best method of creating binding obligations is to employ the most widely recognized method of creating international law—treaties.³¹⁴ The acid rain debate between the United States and Canada can be resolved through application of international environmental principles. The 1991 Air Quality Agreement contains the essential requirements for creating a binding agreement between the United States and Canada.

³¹² Birnie, *supra* note 299, at 100–106.

³¹³ *Id.*

³¹⁴ *Id.*