PROTECTING THE WHITE CONTINENT: IS THE ANTARCTIC PROTOCOL MERE WORDS OR REAL ACTION?

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"Great God! This is an awful place."

—Robert F. Scott, from his diary.

I. INTRODUCTION

Explorers, scientists, and tourists have been drawn to the seventh continent for a myriad of reasons. It is the highest, coldest, driest, and windiest place on earth. As such, it is of great interest to hundreds of researchers and lay persons. That its conditions are so extreme and at the same time so pristine make Antarctica one giant laboratory for many different kinds of research. However, with the people has come pollution, and the once virgin continent is beginning to show the telltale sign of man's presence: garbage.

More than eighty years after his trip to the South Pole, tin cans still line the shelves of the hut Captain Robert F. Scott left behind in Antarctica.[1] The pollution in Antarctica continues today in the form of oil spills, the dumping of raw sewage into bays, and the destruction of penguin breeding grounds, to name a few examples. While the pollution is limited to a very small proportion of the continent, those areas which are polluted are particularly vulnerable because they are the few places where plant and animal life can exist and flourish.[2] Out of concern for these areas and the potential for future harm to the continent, the

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1. Paul Mylrea, *Waste, Pollution Threatens Antarctica, But Conditions Are Improving*, L.A. Times, May 26, 1991, at A5. Perhaps the most famous event in the history of Antarctica was the race for the South Pole between Roald Amundsen of Norway and Robert Falcon Scott of Great Britain. (An expedition from Japan led by Choku Shirase also set out in the race to the South Pole, but had to drop out because of their inability to make it past ice packs in the Ross Sea.) Amundsen won this race, beating Scott by more than a month. Scott did not survive the return trip from the Pole. Walter Chapman, The Loneliest Continent 172 (1964). The huts were originally left behind by explorers of Antarctica as resupply stations for their return trips from the interior of the continent and as base camps. *Id.* Today, many of these huts are kept as historic sites. Janet Hughes, *Mawson's Antarctic Huts and Tourism: A Case for On-site Preservation*, 28 Polar Record 37, 40 (1992). *See also* Richard Stonehouse, *Historic hut site at Waterboat Point, Antarctica*, 28 Polar Record 364 (1991).

2. Michael Cross, *Antarctica's Fragile Beauty Scarred by Humans; An International Conference on the Protection of Antarctica Will Open in Madrid Today. Michael Cross, on the MV Gondwana, Reports on Environmental Damage to the Continent*, Independent, Apr. 22, 1991, at Home News Page, 6.

members of the Antarctic Treaty System (ATS)[3] have signed the Protocol on Environmental Protection to the Antarctic Treaty (Protocol).[4]

This Comment will demonstrate that the Protocol, in its present state, is insufficient to protect the Antarctic environment. The Comment will trace the history of the Antarctic Treaty System from its origin in sovereignty conflicts to the present Protocol. It will then discuss relevant provisions of the Protocol and address several problem areas in which the Protocol is deficient or ineffective. Finally, this Comment will suggest several ways to strengthen the Protocol so as to adequately protect the fragile Antarctic environment.

II. BACKGROUND

There are many different reasons why Antarctica holds a special significance to nations throughout the world. Because of its location and climatic conditions, the continent is an area of tremendous research. Antarctica is the location of many known biological resources[5] and may prove to hold a large amount of mineral resources.[6] Also, Antarctica's position at the bottom of the world makes

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3. The Antarctic Treaty System was created by the Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 71.

4. Protocol on Environmental Protection to the Antarctic Treaty, Oct. 4, 1991, 30 I.L.M. 1461 [hereinafter Protocol].

5. Antarctica and its surrounding islands support forty breeding species of birds which include four species of albatross, twenty species of petrel, seven species of penguin (emperor, adelie, chinstrap, gentoo, macaroni, rockhopper, and king) and an assortment of gulls, terns, skaus, sheathbills, and cormorants. Plant life on the continent is limited to forty-five species of moss, five species of liverwort, and only two species of flowering plants. The islands have a greater number of mosses and liverworts, several species of fern, and a substantially greater number of flowering plants. The moss contain tiny primitive insects called collembola. There are also mites and wingless mosquito-like flies that live in Antarctica.

The Southern Ocean is home to six species of seals—Ross, Crabeater, Weddell, Leopard, Antarctic Fur, and Elephant. There are also three species of whale that live year round in the ice pack (bottlenose, minke, and killer whales). Sperm, humpback, blue, fin, sei, and some minke migrate to the Southern Ocean in the Antarctic winter each year. Bernard Stonehouse, North Pole, South Pole: A Guide to the Ecology and Resources of the Arctic and Antarctic 83-103 (1990). The base of the Antarctic food chain is a shrimp-like zooplankton called krill, of which there are six species in Antarctic waters. Deborah Shapley, The Seventh Continent 112, 113 (1985). There are also species of fish (twelve of which have commercial potential) and squid. James N. Barnes, *The Emerging Convention on the Conservation of Antarctic Marine Living Resources: An Attempt to Meet the New Realities of Resource Exploitation in the Southern Ocean, in* The New Nationalism and the Use of Common Spaces 241 (Jonathan I. Charney ed., 1982).

6. Several minerals with commercial value have been found in trace quantities in

it a desirable strategic location for military purposes.[7] Consequently, several nations have made territorial claims to the continent which, in turn, has led to the formation of the Antarctic Treaty System and the agreements within it.

A. The Importance of Antarctica

1. Research

Antarctica is a land of extremes. It is the coldest place on earth[8] with an average temperature of seventy degrees below zero Fahrenheit.[9] Temperatures

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Antarctica. East Antarctica has traces of gold, gold-copper, iron, beryllium, tantalum, tin, and tungsten. The gemstones topaz, tourmaline, and garnet have also been found there. In the transantarctic mountains, there are massive beds of coal, but its low market cost coupled with the high cost of shipping prevent Antarctic coal from being an economic investment. There is also speculation about the presence of iron, gold, silver, copper-lead-zinc, tin, tungsten, and molybdenum in these mountains. The Antarctic peninsula contains copper, molybdenum, and malachite. Antarctica also has a layered inversion, called the Dufek Massif. Layered inversions form when magma collects in a large underground chamber and "cools slowly, so that the minerals separate into layers as it solidifies." Shapley, *supra* note 5, at 133-39. Often these inversions are mineral-rich. The Bushveld Complex in South Africa contains rich deposits of platinum, gold, nickel, copper, chromium, vanadium, iron, and tin. James H. Zumberge, *Potential Mineral Resource Availability and Possible Environmental Problems in Antarctica, in* The New Nationalism and the Use of Common Spaces, *supra* note 5, at 126. As of yet, no deposits of economic value have been found in Antarctica. This may be because, of the two percent of the continent not covered by ice, approximately only one percent has been explored for minerals. Shapley, *supra* note 5, at 127.

There have been estimates of 45 billion barrels of oil and 115 trillion cubic feet of natural gas in the Antarctic. These, however, are estimates of in-place deposits, of which only one-third tend to be extracted. Shapley, *supra* note 5, at 125. A 1983 U.S. Geological survey indicated that West Antarctica may be the most promising area in Antarctica for petroleum, but that the only practical areas for exploiting these resources, if they exist, are the continental margins. Petroleum and Mineral Resources of Antarctica, Geological Survey Circular 909, 22 (John C. Behrendt ed., 1983). *See also* Mineral Resources Potential of Antarctica (John F. Splettstoesser & Gisela A.M. Dreschoff eds., 1990).

7. To begin with, it is a prime position from which to control the Southern Ocean and the south Atlantic. Second, it is important in controlling the shipping lanes around South America. Jeffrey Myhre, The Antarctic Treaty System: Politics, Law, and Diplomacy 26 (1986). Finally, it is also a militarily important position which could shift the balance of power in a nuclear age. Thomas E. Dewey, *Antarctica Should Remain Off Limits To United Nations Meddling*, Heritage Foundation Reports, Dec. 29, 1986, *available in* LEXIS, News Library, Arcnws File.

8. F.M. Auburn, Antarctic Law and Politics 2 (1982).

9. James F. Smith, *Struggling To Protect The 'Ice'; Tourism And Even Scientific*

reach as low as 128 degrees below zero.[10] Antarctica has one of the world's driest deserts, but ninety-eight percent of the continent is covered by ice.[11] The ice cap has an average thickness exceeding 2,300 meters,[12] and is so heavy that it forces most of the continent below sea level, actually distorting the shape of the earth.[13] The cap comprises ninety percent of the world's ice and holds seventy percent of the world's fresh water.[14] The currents generated by ice cap runoff are the "engine" for the earth's seas.[15] If the ice cap were to melt, the oceans of the world would rise sixty meters.[16] It is also the home of the world's windiest place, Commonwealth Bay, where the winds gust up to 320 kilometers per hour.[17] Antarctica is also relatively well preserved. It has no permanent human population and was the last continent explored by humans.[18]

Antarctica's extreme conditions and virgin environment make it attractive to many different kinds of scientific research. Its similarity in weather conditions to Mars led NASA to test new techniques and technologies there, including robots which study life forms and explore terrain.[19] This research could potentially lead to new ways of growing fresh vegetables and to innovative heating and waste-recycling equipment.[20] The freezing environment preserves meteorites free from terrestrial contamination in a way that no other continent does.[21] For researchers, another special feature of the continent is the polar ice cap. It accumulates in layers and in doing so traps traces of successive atmospheres. By drilling ice cores, scientists can recreate the history of the region's climate for the past thousand years.[22]

Research Are Threatening Antarctica's Pristine Beauty. But the Push Is On To Preserve This Last Untainted Laboratory, L.A. Times, Apr. 5, 1990, at A1.

10. Michael D. Lemonick, *Antarctica; Once Inaccessible And Pristine, The White Continent Is Now Threatened By Spreading Pollution, Budding Tourism And The World's Thirst For Oil*, Time, Jan. 15, 1990, at 56.

11. *Id.*

12. James H. Zumberge, *Potential Mineral Resource Availability and Possible Environmental Problems in Antarctica, in* The New Nationalism and the Use of Common Spaces, *supra* note 5, at 117.

13. Susan Aldridge, *The Last Place On Earth*, The Guardian, Jan. 27, 1992, at Education p.6.

14. Lemonick, *supra* note 10.

15. Smith, *supra* note 9, at A1.

16. A. Pralnikov, *Souvenir From Antarctica—Three Views of a Distant Continent*, Vol. XXXVII No. 7 Current Digest of the Soviet Press 19 (Mar. 13, 1985).

17. Lemonick, *supra* note 10.

18. Keith Suter, Antarctica: Private Property or Public Heritage? 4 (1991).

19. Donald J. Frederick, *Antarctic Becomes Testing Ground For Future Manned Voyage To Mars*, L.A. Times, Oct. 3, 1993, at A4.

20. *Id.*

21. *The Poor Man's Space Probe*, Economist, Apr. 27, 1991, at 89.

22. Roger Highfield, *Fifty Scientists Icebound In The Antarctic*, The Daily Telegraph, Dec. 24, 1992, at 6. *See also* David L. Chandler, *Climate; Ice Cores Raise the Question: Is Our Luck Running Out?*, The Boston Globe, July 19, 1993, at Science & Technology p.25.

Researchers are also drawn to Antarctica because of its location. They have been monitoring the ozone hole in the Antarctic since 1957 because of the hole's location over the Pole.[23] Oceanographers are researching life in the Gerlache Strait near the Antarctic Peninsula which will "help analyze aspects of the 'greenhouse effect' of global warming."[24]

2. Potential Resources

There has been much speculation about the natural resources, both living and mineral, in and around Antarctica. The fishing, sealing, and whaling industries have exploited the living resources for decades,[25] with no regard for the impact on the Antarctic environment. Today, the greatest threat by humans to the Antarctic ecosystem is the potential depletion of the krill population.

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23. Patricia Reaney, *Two-Thirds of Antarctic Ozone Layer Said Destroyed*, Reuter Libr., Oct. 5, 1993, *available in* LEXIS, News Library, Curnws File. Antarctica's best known environmental problem is the growing hole in the ozone layer above it. The ozone layer prevents the sun's ultraviolet rays from penetrating the earth's atmosphere. The increase of ultraviolet light in the atmosphere can lead to an increase in the amount of skin cancer in humans. *Government Confident Ozone Layer's Destruction Will Be Halted; Scientists Credit New Refrigerants. Predict a Turnaround in 5 to 10 Years*, The Houston Chronicle, Jan. 7, 1994, at A10 [hereinafter *Government Confident*]. It can also cause sunburn in plants and animals. Bruce V. Bigelow, *Company Sets Hole New Standard in Monitoring Ozone Depletion*, San Diego Union-Tribune, Dec. 8, 1993, at E1. The hole in the ozone has recently been measured at a size greater than 23 million square kilometers. David C. Walters, *Antarctica Lab Researches Effects of the Ozone Hole*, Christian Science Monitor, Dec. 29, 1993, at Special Report p.11. The hole is caused by chlorofluorocarbons (CFCs) from refrigerants, health sprays, cleaning solvents, and plastic foams. *Government Confident, supra.* While the ozone hole is clearly an important environmental problem for the Antarctic, its causation lies primarily outside of the continent. As such, it is outside of the area of concern for the Antarctic Treaty System, and beyond the scope of this Comment.

24. As plant biomass increases in the strait, it absorbs carbon dioxide from the atmosphere which helps to regulate the environment. Smith, *supra* note 9, at A1.

25. The Japanese killed a record 22,000 whales in Antarctic waters in 1965. Teruaki Ueno, *Japan Plans Whaling Campaign Ahead Of IWC Meeting*, Reuter Libr., Jan. 29, 1993, *available in* LEXIS, News Library, Arcnws File. Today, there are still reports of overfishing in the Southern Ocean, specifically by the former Soviet fleet. *Soviet Fishing Vessels Flout Antarctic Regulations: Report*, Agence France Presse, Oct. 21, 1991, *available in* LEXIS, News Library, Arcnws File. The overfishing has led to the radical depletion of some species. Walter Sullivan, *Report Fears Over-Exploitation of Antarctic Marine Resources*, The N.Y. Times, Mar. 12, 1987, at B13. However, the ban on whaling has reduced the number of whales killed. The number of whales killed by the Japanese dropped to 2,700 in 1987. Ueno, *supra.*

The Southern Ocean contains the world's largest fishery stock of krill.[26] Krill are crustaceans which serve as the base of the food chain for the majority of predator species in the Southern Ocean.[27] The unusual dependence by so many species on a single food source creates a precarious balance that will be destroyed if the krill population is decimated by overfishing or pollution.[28] Thus, to protect the marine resources of the Southern Ocean, any agreement for the protection of the Antarctic environment must take into account threats to the krill population.

Unlike the living resources of Antarctica, which are more visible, the existence and amount of any mineral resources has been a source of much debate. The continent undoubtedly contains mineral deposits, but it is unclear what kind and how much.[29] For the time being, whether or not large quantities of minerals are locked in the Antarctic continent is a moot point because it is economically

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26. Auburn, *supra* note 8, at 205.

27. *Id.* at 205, 207. *See also* Marinelle Basson & John Beddington, *CCAMLR: The Practical Approach of an Eco-System Approach, in* The Antarctic Treaty System in World Politics 54, 56 (Arnfinn Jorgensen-Dahl & Willy Ostreng eds., 1991).

28. Concerns about overfishing of krill and other species were dealt with by The Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR). *See* Basson & Beddington, *supra* note 27, at 54.

29. For now, there is only speculation as to the types of minerals and their amounts in Antarctica. This speculation arises from several different theories. One such theory is that the Antarctic Peninsula is an extension of the Andean organic belt and, as such, could contain similar types of mineral deposits. Another theory is that some areas of Antarctica have similar geological formations to mineral-rich formations elsewhere in the world. Zumberge, *supra* note 6, at 124-27. "[T]here is no doubt that large deposits of minerals exist in Antarctica, just as they exist in every continent." Auburn, *supra* note 8, at 242. This speculation correlates with Gondwana theory, which postulates that Antarctica was once part of a supercontinent with parts of South America, Southern Africa, Australia, and India. By extrapolating from the amount of mineral deposits known to be in these other continents, it can be inferred that Antarctica has a considerable amount of mineral deposits. *Antarctica on Ice*, The Mining Journal, Oct. 27, 1989, at 349. Gondwana theory was introduced in 1883 by Austrian geologist Edward Suess, and expanded upon by Alfred Wagener thirty years later. Wendy A. Wilsher & Maarten J. DeWit, *Toward a Quantitative Mineral Resource Assessment of Antarctica from a Gondwana Perspective, in* Mineral Resources Potential of Antarctica, *supra* note 6, at 7. A statistical study based on this theory suggests that Antarctica could contain approximately 920 mineral deposits. *Frozen Assets*, The Mining Journal, Dec. 2, 1988, at 422. One limit to the Gondwana reconstruction theory is that it is "largely restricted to consideration of rocks that predate the Gondwanaland (sic) fragmentation. After fragmentation, the various fragments have distinct geological histories." John C. Behrendt, *Are There Petroleum Resources in Antarctica?, in* Petroleum and Mineral Resources of Antarctica, *supra* note 6, at 3. Another potential difficulty with it is that the continents of the Southern hemisphere have been less mineral-rich than those of the Northern hemisphere, Shapley, *supra* note 5, at 127.

prohibitive to recover any minerals from the continent.[30] Such extraction is currently infeasible because ninety-five percent of the continent is covered by a thick continental ice cap that is in permanent motion.[31] Until it becomes economically feasible to extract minerals from Antarctica, a definitive answer to the question of how extensive the Antarctic mineral resources are will not be had.

3. Strategic Importance

The strategic importance of the Antarctic continent became apparent during the Second World War when British warships assigned to protect Allied transport ships in the South Atlantic hunted German submarines.[32] A military base situated in Antarctica could control the Southern Ocean and the South Atlantic.[33] The continent also possesses specific strategic significance because it forms the southern boundary of Drake's Passage,[34] which is the only available passage for shipping around South America should the Panama Canal be closed or otherwise unavailable.[35]

The military importance of Antarctica gained new significance after World War II, during the era of the Cold War. Nuclear deployment from bases in

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30. The greatest obstacle to the development of mineral resources on the continent is the permanently moving ice cap. Geoffrey Larminie, *The Mineral Potential of Antarctica, The State of the Art, in* The Antarctic Treaty System in World Politics, *supra* note 27, at 88. The ice cap flows from the interior of the continent outward towards its coasts under the influence of gravity. D.J. Drewry, *The Antarctic Physical Environment, in* The Antarctic Treaty Regime 17 (Gillian D. Triggs ed., 1987). The Filchner Ice Shelf moves at a rate of three meters per day. *Frozen Assets, supra* note 29, at 422. Shipping costs and low quality make it cost-prohibitive to take advantage of the abundance of coal in the Transantarctic Mountains. Zumberge, *supra* note 6, at 126. It is estimated that for the recovery of oil resources to be economically feasible, nothing smaller than giant (0.5 billion barrels or 70 million tons of recoverable oil) or more likely supergiant (5 billion barrels or 700 million tons of recoverable oil) must be discovered. Behrendt, *supra* note 29, at 3. This is problematic because it is believed that there are only four to ten supergiant oil fields which remain to be discovered in the entire world. Shapley, *supra* note 5, at 132. Geoffrey Larminie has suggested that while it costs approximately $20 million to drill an exploration well in the North Sea, it could cost close to $300 million just to drill a land well on an island near Antarctica. Geoffrey Larminie, *Discussion on Technology and Economics of Minerals Development in Polar Areas, in* Antarctic Treaty System: An Assessment 265 (1986).

31. *Frozen Assets, supra* note 29. *See also* Larminie, *supra* note 30, at 88.

32. Emilio J. Sahurie, The International Law of Antarctica 172 (1992).

33. No military bases have ever been established for this purpose because of the demilitarization of the continent. Antarctic Treaty, *supra* note 3, art. I, 12 U.S.T. 795, 402 U.N.T.S. 72. *See also infra* notes 89-92 and accompanying text.

34. Myhre, *supra* note 7.

35. Dewey, *supra* note 7.

Antarctica by either of the superpowers could have shifted the balance of power.[36] In the face of this superpower standoff, the Antarctic Treaty of 1959 was signed. This agreement provided for, among other things, the demilitarization of the seventh continent.[37]

B. Sovereign Claims to Antarctica

Prior to the formation of the Antarctic Treaty System, several nations made sovereign claims to parts of the Antarctic continent. Other nations have had reasonable bases for making territorial claims, but, to date, none have made an officially recognized claim to Antarctica.[38] Those nations which have made claims to Antarctica include: Argentina, Australia, Chile, France, Great Britain, New Zealand, and Norway. The claims of Argentina, Chile, and Great Britain overlap and are highly contested.

Great Britain was the first country to make an Antarctic claim.[39] Britain's claim overlaps all of Argentina's claim, most of Chile's claim and contains only a small portion unclaimed by either South American country. The claimed

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36. *Id.*

37. The Antarctic Treaty, *supra* note 3, art. I, 12 U.S.T. 795, 402 U.N.T.S. 72.

38. The Russians believe that Bellingshausen and Lazarev were the first to discover Antarctica, giving them a territorial claim by discovery. Sergei Brilev, *Antarctica: No Man's Land*, Moscow News, Aug. 18, 1993. Bellingshausen was, in fact, late in discovering Antarctica. He did, however, actually discover an island just off the Antarctic coast, now named Alexander I island. Edward Bransfield, an English explorer, is credited with being the first to sight the continent. The American view is that Nathaniel Palmer, an American seal hunter, commanded the first expedition to discover the Antarctic continent and that Bransfield merely discovered Trinity Island, a large island off the mainland. Chapman, *supra* note 1, at 42-53. In 1946, the United States sent almost 5,000 men to Antarctica on Operation Highjump. It was an exploratory and mapping mission of the unclaimed region (Marie Byrd Land), the Ross Dependency, and part of the Australian claimed territory. Sahurie, *supra* note 32, at 252. During the mission, sixty-eight claims markers were dropped and 777,000 square kilometers of the continent were photographed. This was followed by Operation Windmill and the Ronne expedition. Operation Windmill continued mapping the continent, discovered the Windmill islands, and dropped twelve claims markers. The Ronne expedition mapped 1,165,500 square kilometers, half of it previously unseen. This land stretched from the Antarctic peninsula to the Weddell Sea and Coats Land. The U.S. claim was never put forward for two reasons. First, there were concerns about challenging Argentina, Chile, and Great Britain, who were already embroiled in disputes over territory. Second, the outcome was uncertain if the issue were to be put to arbitration. Shapley, *supra* note 5, at 52-54.

39. The original claim was made in 1908 and amended in 1917 so as not to include part of the South American mainland. Shapley, *supra* note 5, at 69.

territory extends from twenty degrees west to eighty degrees west.[40] The British claim to title is premised upon discovery and subsequent effective occupation.[41]

New Zealand's claim is primarily to an ice shelf, the Ross Dependency, and extends from 160 degrees east to 150 degrees west.[42] This claim was originally asserted by Great Britain on the basis of discovery and was inherited by New Zealand upon its independence.[43] There are two weaknesses in New Zealand's claim. First, whether a nation can make a territorial claim to an ice shelf is unclear.[44] Second, New Zealand's activity in the Ross Dependency is minimal in comparison with U.S. activity there and, in fact, is dependent upon U.S. support.[45]

France's small claim divides Australia's two claims and includes the area between 136 degrees east and 142 degrees east longitude.[46] The claim is based upon effective occupation after discovery, and is highly defensible because of its limited size.[47]

Australia has the largest Antarctic claim, which encompasses the area between the meridians 45 degrees east and 136 degrees east and the area between 142 degrees east and 160 degrees east.[48] The Australian claim is based upon effective occupation of the area after acquiring title from Great Britain, whose claim to title was based upon discovery and exploration.[49] Australian occupation consists of four bases in the area.[50] Because of this, Australia's argument of effective occupation is quite tenuous. The territory claimed by Australia makes up close to one-third of the entire area of the continent. That a nation can claim effective occupation of such a vast area with so few bases is doubtful.[51]

Norway's continental claim is limited to the coastal sector from twenty degrees west to forty-five degrees west longitude.[52] Norway also claims Bouvet Island and Peter I Island for whaling bases.[53] The basis for these claims is

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40. Myhre, *supra* note 7, at 14.

41. *Id.*

42. Sahurie, *supra* note 32, at 17.

43. *Id.* The claim was made by a British Order-in-Council in 1923 and assigned to New Zealand. Shapley, *supra* note 5, at 72.

44. Sahurie, *supra* note 32, at 17.

45. *Id.* at 18.

46. *Id.* at 27. The claim was originally made in 1924 and redefined in 1938. Shapley, *supra* note 5, at 72, 73.

47. Myhre, *supra* note 7, at 15.

48. Sahurie, *supra* note 32, at 14. Great Britain asserted this claim in Australia's behalf by an Order-in-Council in 1933. Shapley, *supra* note 5, at 73.

49. Myhre, *supra* note 7, at 14.

50. *Id.*

51. *Id.*

52. *Id.* at 15. Norway's claim to the mainland was made in 1939. Shapley, *supra* note 5, at 74.

53. Sahurie, *supra* note 32, at 29. The claim to Bouvet Island was made in 1928, and Peter I Island was claimed in 1931. Shapley, *supra* note 5, at 74.

discovery, exploration, and activity in the area.[54] Because of its effective occupation of a well-defined territory, Norway's claim is one of the strongest among those nations advancing a claim to the continent.[55]

Chile's territorial claim, which runs from fifty-three degrees west to ninety degrees west,[56] is largely overlapped by British and Argentinian claims.[57] Similar to Argentina, Chile claims effective occupation since 1947.[58] However, much of Chile's territorial claim is also claimed by Great Britain and Argentina, and either of these may have prior claims.[59]

Argentina lays claim to the lands between the meridians twenty-five degrees west and seventy-four degrees west, sixty degrees south latitude.[60] This claim covers an area of 1,230,000 square kilometers and is believed to have the greatest resource potential.[61] Argentina's claim is overlapped by Chile's claim, partially, and Great Britain's claim, totally.[62] Argentina's claim is based on the occupation of a weather station in South Orkney since 1904, in addition to other bases that were established later.[63]

C. Resolving the Disputes

1. Origins of the Antarctic Treaty of 1959

The resolution of the conflict over sovereign claims to Antarctica is often traced back to the International Geophysical Year (IGY).[64] The International

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54. Sahurie, *supra* note 32, at 30.

55. Myhre, *supra* note 7, at 15.

56. *Id.* at 13. Chile's claim was made by presidential decree in 1940. Shapley, *supra* note 5, at 76.

57. Sahurie, *supra* note 32, at 26.

58. Myhre, *supra* note 7, at 13.

59. *Id.*

60. Sahurie, *supra* note 32, at 19. This claim was made verbally by the Peron government in 1947. Shapley, *supra* note 5, at 76.

61. Sahurie, *supra* note 32, at 19.

62. *Id.*

63. Myhre, *supra* note 7, at 13. Argentina is probably third, behind the United States and the former Soviet Union, in its involvement activities in Antarctica, including programs, activities, bases, and personnel. Sahurie, *supra* note 32, at 20.

64. Rolph Trolle-Anderson, *The Antarctic Scene: Legal and Political Facts, in* The Antarctic Treaty Regime, *supra* note 30, at 59. The International Geophysical Year was originally going to be the Third Polar Year; the first two polar years were in 1882-83 and 1932-33. It was timed to coincide with a period of increased solar activity which would impact the earth's ionosphere. This activity could be observed from both poles. This plan was eventually broadened to include observations from all over the world and to include other scientific disciplines. It was subsequently renamed the International Geophysical Year. Shapley, *supra* note 5, at 58, 59.

Geophysical Year was a world-wide study of natural phenomenon sponsored by the United Nations lasting from July 1, 1957, through December 31, 1958.[65] During a conference in preparation for the IGY, it was decided that the two regions that should be explored were the Antarctic and outer space,[66] which resulted in an increased interest in Antarctica by many nations.

During the IGY, twelve nations—those with territorial claims, the United States, the Union of Soviet Socialist Republic (USSR), Belgium, Japan, and South Africa—established sixty bases for wintering in Antarctica and on islands of the Southern Ocean.[67] Heavy Soviet activity led the United States to double its number of bases in Antarctica during the IGY.[68] The decision by many countries to participate heavily in the exploration of Antarctica during the IGY was ultimately more political than scientific.[69] Once in Antarctica, however, there was little political tension between scientists of different nations.[70]

Cooperation between researchers during the IGY led to the formation of the Scientific Committee on Antarctic Research (SCAR), a scientific cooperative organization.[71] The overriding goal of SCAR is to "nurture the seed of international cooperation."[72] In doing so, it must "abstain from involvement in political and juridicial matters, including the formulation of management measures for exploitable resources, except where SCAR accepts an invitation to advise on a problem."[73]

The IGY was a success in international scientific cooperation and revived interest in the establishment of a more permanent regime in Antarctica.[74] For most nations, Antarctic participation during the IGY had been anticipated as a one-time activity, but the Soviet decision to remain in Antarctica after the IGY forced the United States and other nations to remain to protect potential claims.[75] The positive experience of the IGY laid the foundation for negotiations concerning an international treaty on the Antarctic.[76] In 1958, the United States invited those nations active in Antarctica during the IGY to negotiate a treaty for

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65. Suter, *supra* note 18, at 18.

66. *Id.* at 179.

67. Trolle-Anderson, *supra* note 64, at 58.

68. Suter, *supra* note 18, at 18.

69. The Wilkes station was established by the United States to prevent the Soviet Union's ability to stake a claim to the area. Auburn, *supra* note 8, at 63.

70. For example, when a Soviet team raised the Soviet flag over Australian claimed Antarctic territory in celebration of the Soviet Communist Party Congress, it caused a sensation among politicians and the media in Canberra, but was taken calmly by the Antarctic scientists. Suter, *supra* note 18, at 18.

71. Trolle-Anderson, *supra* note 64, at 58.

72. Suter, *supra* note 18, at 18.

73. SCAR Constitution, Guidelines for the Conduct of SCAR Affairs No. 3, *reprinted in* Antarctica and International Law 5, 6 (W. M. Bush ed., 1982).

74. Sahurie, *supra* note 32, at 181.

75. Auburn, *supra* note 8, at 88, 89.

76. Trolle-Anderson, *supra* note 64, at 59.

the peaceful use of Antarctica.[77]

More recently, the origin of the Antarctic Treaty of 1959 has been attributed to an attempt by the United States Department of State to avoid a potential conflict between its allies.[78] The territorial dispute between Great Britain and the South American claimants became so heated that it threatened to become a war.[79] Because the United States had signed a common defense treaty[80] with both Argentina and Chile, it desperately needed to resolve the impending conflict.[81] Consequently, the U.S. Policy Planning Staff issued a policy paper delineating American Antarctic policy as seeking to eliminate disputes over Antarctica, preserving the continent for scientific use, and protecting U.S. national interests.[82] Attached to this proposal was a draft agreement on Antarctica which laid the foundation for what ultimately became the Antarctic Treaty.[83] A revised draft of this proposal was circulated among the claimant nations in August of 1948, but was rejected.[84] In the Chilean rejection were the beginnings of a new treaty: a call for the free exchange of scientific information and a moratorium on territorial issues.[85]

2. The Antarctic Treaty of 1959

While the great success of the IGY established a forum for the creation of an international agreement regarding the Antarctic, the dispute between the South American claimants and Great Britain, along with the continued occupation of the Antarctic by the Soviets, demonstrated the urgent need for such an instrument. The result was the Antarctic Treaty of 1959.[86] This treaty was signed in Washington, DC, on December 1, 1959, by Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the U.S.S.R., Great Britain and the United States of America.[87] The treaty applies to the entire area south of sixty degrees South Latitude.[88]

The Antarctic Treaty accomplished two amazing political feats. First, at the height of the Cold War, it bound the two superpowers to the demilitarization of an entire continent.[89] The Treaty provided for the inspection of "[a]ll areas of

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77. *Id.* at 59.
78. Myhre, *supra* note 7, at 23.
79. *Id.* at 25.
80. Inter-American Treaty of Reciprocal Assistance, Sept. 2, 1947, 62 Stat. 1681.
81. Myhre, *supra* note 7, at 25.
82. *Id.* at 26.
83. *Id.* at 27.
84. *Id.* at 28.
85. *Id.* at 30. *See also* Dewey, *supra* note 7.
86. Antarctic Treaty, *supra* note 3.
87. *Id.*, 12 U.S.T. 794, 402 U.N.T.S. 72.
88. *Id.* art. VI, 12 U.S.T. 797, 402 U.N.T.S. 76.
89. *Id.* art. I, 12 U.S.T. 795, 402 U.N.T.S. 72.

Antarctica, including all stations, installations and equipment within those areas"[90] in order to ensure the observation of the Treaty.[91] Military personnel and equipment are permitted on the continent to aid in scientific research or for other non-military purposes, but the continent is reserved for peaceful purposes only.[92] Second, the Treaty avoided a possible confrontation between claimant nations by suspending any discussions about Antarctic territorial claims for the duration of the Treaty.[93] The Treaty does not present an ultimate resolution to the issue of sovereign claims, but rather suspends claims as they existed at the signing of the Treaty.[94] The Treaty is open to review of its operation after thirty years from the date of its entry into force.[95]

The Antarctic Treaty served another important purpose by creating a cooperative atmosphere for the exchange of information regarding plans for scientific programs, scientific personnel, and scientific observations and results.[96] The Treaty attempted to promote the "freedom of scientific investigation in Antarctica"[97] through these measures.

The Treaty foreshadowed the modern Protocol on Environmental Protection to the Antarctic Treaty in its attempt to implement environmental protections of the Antarctic continent. The Treaty absolutely prohibits nuclear explosions and the disposal of radioactive waste.[98] It also names as one of the objectives of the Treaty, to be worked out by the parties at subsequent meetings, the "preservation and conservation of living resources in Antarctica."[99]

The Treaty is open to accession by any United Nations member state or any other state invited to accede by the consent of all of the Antarctic Treaty Consultative Parties (ATCPs).[100] Those nations acceding to the Antarctic Treaty can be divided into three different categories: the original signatory Consultative Parties, Acceding Consultative Parties, and Non-Consultative Acceding Parties. Consultative Parties are entitled to send representatives to participate in and vote on issues at Consultative Meetings.[101] The original signatory nations

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90. *Id.* art. VII(3), 12 U.S.T. 797, 402 U.N.T.S. 76.
91. *Id.* art. VII, 12 U.S.T. 797, 402 U.N.T.S. 76.
92. *Id.* art. I, 12 U.S.T. 795, 402 U.N.T.S. 72.
93. *Id.* art. IV, 12 U.S.T. 796, 402 U.N.T.S. 74.
94. *Id.* art. IV, 12 U.S.T. 796, 402 U.N.T.S. 74. The treaty provides that: "No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica." *Id.* art. IV(2), 12 U.S.T. 796, 402 U.N.T.S. 74.
95. *Id.* art. XII(2), 12 U.S.T. 799, 402 U.N.T.S. 82.
96. *Id.* art. III, 12 U.S.T. 796, 402 U.N.T.S. 74.
97. *Id.* art. II, 12 U.S.T. 795, 402 U.N.T.S. 74.
98. *Id.* art. V, 12 U.S.T. 796, 402 U.N.T.S. 76.
99. *Id.* art. IX(1)(f), 12 U.S.T. 798, 402 U.N.T.S. 80.
100. *Id.* art. XIII, 12 U.S.T. 800, 402 U.N.T.S. 82.
101. *Id.* art. IX, 12 U.S.T. 798, 402 U.N.T.S. 78.

automatically gained Consultative status,[102] but an acceding nation can only gain Consultative status "during such time as that Contracting Party demonstrates its interest in Antarctica by conducting substantial scientific research activity there, such as the establishment of a scientific station or the dispatch of a scientific expedition."[103] There are presently twenty-six nations that have gained Consultative status in the Antarctic Treaty System.[104] The third category of nations is that of Non-Consultative Acceding States.[105] These nations may not participate in the Antarctic Treaty Consultative Meetings (ATCMs).

3. Other Treaties Within the System

The original Antarctic Treaty was a limited instrument and was ultimately not suited to deal with all of the different issues surrounding Antarctica. Its existence, however, did establish a forum for dealing with problems when they occurred. As a result, different agreements developed within the System to deal with individual issues.

a. Agreed Measures for the Conservation of Antarctic Fauna and Flora[106]

The Agreed Measures was created "to implement the principles and purposes of the Antarctic Treaty"[107] and applies to the same geographic area.[108] It protects the native mammals and birds of the area,[109] as well as designating "Specially Protected Areas."[110] These Specially Protected Areas are areas of "outstanding

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102. Article IX provides that contracting parties named in the preamble of the Treaty shall meet "for the purpose of exchanging information, consultinh (sic) together on matters of common interest pertaining to Antarctica, and formulating and considering, and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty." *Id.*

103. *Id.* art. IX(2), 12 U.S.T. 798, 402 U.N.T.S. 80.

104. The Consultative Parties are: Argentina, Australia, Belgium, Brazil, Chile, China, Ecuador, Finland, France, Germany, India, Italy, Japan, The Netherlands, New Zealand, Norway, Peru, Poland, the Republic of Korea, South Africa, Spain, Sweden, the Union of Soviet Socialist Republics (now Russia), the United Kingdom, the United States of America, and Uruguay. 30 I.L.M. 1460.

105. At the signing of the Protocol there were twelve Non-Consultative parties: Austria, Bulgaria, Canada, Colombia, Cuba, Czechoslovakia, Denmark, Greece, Hungary, the Democratic People's Republic of Korea, Romania, and Switzerland. *Id.*

106. The Agreed Measures for the Conservation of Antarctic Fauna and Flora, June 2-13, 1964, 17 U.S.T. 991.

107. *Id.* at Preamble, 17 U.S.T. 996.

108. *Id.* art. I, 17 U.S.T. 996.

109. *Id.* art. VI, 17 U.S.T. 998.

110. *Id.* art. VIII., 17 U.S.T. 999.

scientific interest . . . accorded special protection . . . to preserve their unique natural ecological system."[111] This special protection includes prohibitions against the collection of any native plant without a permit and against the operation of vehicles within the area.[112]

b. Convention for the Conservation of Antarctic Seals[113]

This Convention was created in recognition of the fact that seals are an important marine living resource and their "vulnerability . . . to commercial exploitation."[114] Its goal is the "protection, scientific study and rational use of Antarctic seals."[115] The Convention achieves this by setting a yearly maximum permissible catch for the contracting parties.[116]

c. Convention for the Conservation of Antarctic Marine Living Resources[117]

The Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) was created to "establish suitable machinery . . . to ensure the conservation of Antarctic marine living organisms."[118] CCAMLR applies to an area larger than that of the Antarctic Treaty[119] and, as such, is open to accession by nations which are not parties to the Antarctic Treaty.[120] Consequently, this convention binds parties to the terms of the Antarctic Treaty regarding use of the

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111. *Id.* art. VIII(1), 17 U.S.T. 999.

112. *Id.* art. VIII(2), 17 U.S.T. 999.

113. The Convention for the Conservation of Antarctic Seals, June 1, 1972, 29 U.S.T. 441.

114. *Id.* at Preamble, 29 U.S.T. 443.

115. *Id.*

116. The parties are limited to capture or kill 175,000 Crabeater seals, 12,000 Leopard seals, and 5,000 Weddell seals each year. Ross seals, Elephant seals, and Fur seals of the genus Arctocephalus are protected species and their killing is forbidden. The sealing season is open from the first day of September each year through the last day of the following February. Adult Weddell seals one year or older receive additional protection in that they may only be killed or captured during the month of February. *Id.* at Annex, 29 U.S.T. 478.

117. The Convention for the Conservation of Antarctic Marine Living Resources, May 20, 1980, 33 U.S.T. 3476.

118. *Id.* at Preamble, 33 U.S.T. 3478.

119. *Id.* art. I, 33 U.S.T. 3479. The Convention extends to the Antarctic Convergence which is the line joining the following points along parallels of latitude and meridians of longitude: 50 S, 0; 50 S, 30 E; 45 S, 30 E; 45 S, 80 E; 55 S, 80 E; 55 S, 150 E; 60 S, 150 E; 60 S, 50 W; 50 S, 50W; 50 S, 0. *Id.* art. I(4), 33 U.S.T. 3479.

120. *Id.* art. III, 33 U.S.T. 3480.

continent for peaceful purposes only and as a nuclear free zone.[121] It also provides that acceding parties are bound by the articles of the Antarctic Treaty dealing with territorial sovereignty.[122]

4. The United Nations' Challenge

Malaysia and Antigua and Barbuda presented the "Question of Antarctica" for the agenda of the United Nations' thirty-eighth session in August of 1983.[123] This opened an ongoing debate as to which international system should be responsible for handling the administration of the world's seventh continent. Malaysia and other lesser-developed nations have argued that, while the United Nations is a universal international political body, the Antarctic Treaty System is a system of limited participation. They claim that the Treaty System is an elitist club which maintains exclusive control over the mineral resources of Antarctica.[124] Some countries were concerned that when the Treaty came to an end, the Treaty members would exploit these resources.[125] The complaining countries assert that Antarctica belongs to all nations as a "common heritage of all mankind."[126] Despite arguments that the Treaty System is open to any nation that is a member of the United Nations,[127] these countries contend that involvement in the Treaty System as a voting member is cost prohibitive and, as such, unfair.[128]

Action in the United Nations by these challengers has been largely ineffective. The First Committee of the United Nations adopted resolutions regarding Antarctica, but none of them addressed the question of which regime should be responsible for the management of Antarctica.[129] The Antarctic Treaty

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121. *Id.*

122. *Id.* art. IV, 33 U.S.T. 3480-81.

123. Myhre, *supra* note 7, at 114.

124. *Environment: Stronger Action Urged on Antarctica*, Inter Press Service, Aug. 13, 1991, *available in* LEXIS, News Library, Arcnws File.

125. Walter Sullivan, *Meeting Near Pole to Take Up Antarctica's Future*, N.Y. Times, Dec. 20, 1984, at §1, p.12.

126. *Id.*

127. Antarctic Treaty, *supra* note 3, art. XIII, 12 U.S.T. 800, 402 U.N.T.S. 82.

128. Deborah Shapley, *Delegates Debate Antarctica's Future*, N.Y. Times, Jan. 29, 1985, at C4.

129. The first resolution called for the ATCPs to invite the U.N. Secretary General to ATCMs; the ATCPs to deposit information and documents with the Secretary General; the negotiation of a comprehensive environmental protection convention with the participation of the international community; a ban on mining activities; a report on the proposed establishment of a U.N. station in Antarctica; and a report on the Antarctic environment and impact on global systems. The second resolution called for the exclusion of South Africa from the ATCMs. Peter J. Beck, *Antarctica, Vina del Mar and the 1990 UN Debate*, 27 Polar Record 211, 214 (1991). Recent

nations, however, boycotted the votes on these resolutions[130] and had previously voiced their intention to boycott any debates about Antarctica in the United Nations.[131] Unless the nations within the Antarctic Treaty System cooperate, it is doubtful that the United Nations will be able to supplant it.

5. The Need for Environmental Safeguards

Antarctica is regarded as a pristine environment relatively untouched by the hands of man. This reputation attracts scientists of the world to the seventh continent.[132] But Antarctica's history of pollution goes as far back as its first explorers.[133] The problem of pollution is exacerbated by the fact that garbage and material waste do not rot, decay, or rust in below-freezing temperatures and remain frozen on the continent for decades.[134] The vast majority of Antarctica is free of pollution; however, those areas which have been impacted by human activity are the few places in Antarctica where plants and animals can thrive.[135] Shattered glass, broken wires,[136] used swabs, and syringes litter the ground at research stations.[137] Garbage is left in piles on the ice, and raw sewage is pumped into the sea.[138]

Ironically, it is the scientists themselves who have befouled the pristine environment which drew them there.[139] These researchers left behind camps and landing strips which have torn into the Antarctic terrain.[140] The construction of new research facilities and airports is always destructive and can cause tremendous

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changes in South Africa's government have generated expectations of decreased resistance to its participation in the Antarctic Treaty System. *Antarctica; Future Research Will Have Close Ties To Broad Global Issues, NRC Told*, BNA International Environmental Daily, Feb. 12, 1993.

130. Brazil, China, Columbia, Cuba, Ecuador, India, and Peru did vote to expel South Africa from the ATCMs. Beck, *supra* note 129, at 211.

131. Elaine Sciolino, *Antarctic Treaty Nations Threaten to Boycott U.N. Debate*, N.Y. Times, Dec. 4, 1985, at A11.

132. *See supra* text accompanying footnotes 8-24.

133. Ninety year old wooden crates and biscuit tins left behind by Robert Scott and Ernest Shackleton still litter Ross Island. Mike Toner, *U.S. Base in Antarctica Works to Clean Up a Litterbug Image*, The Atlanta J. & Const., Jan. 16, 1993, at E1.

134. Dai Hayward, *New Zealand 2; An Immense Responsibility—The Antarctic*, Fin. Times, July, 23, 1990, at 10.

135. Cross, *supra* note 2, at 6.

136. *Greenpeace on Antarctic Pollution*, TASS, Sept. 5, 1988, *available in* LEXIS, News Library, Arcnws File.

137. Laura Clarke, *Pollution At Science Posts: The Thrashing of Pristine Antarctica*, S.F. Chronicle, July 2, 1991, at A1.

138. Toner, *supra* note 133, at E1.

139. William Booth, *Faceoff Forming on Antarctic Ice; Watchdog Group Threatens to Sue NSF Over Researchers' Waste*, Wash. Post, Sept. 28, 1990, at A25.

140. *Antarctic: Greenpeace Exposes Aggressions Against the Environment*, Inter Press Service, Dec. 25, 1993, *available in* LEXIS, News Library, Curnws File.

damage to indigenous species.[141]

Perhaps the worst of the Antarctic research stations is the United States' base at McMurdo Sound. It is the largest U.S. base on the continent, with a population of over one thousand during the summer season.[142] Until 1981, garbage from McMurdo was either piled on the ice until the spring thaw when it would sink into the sea,[143] dumped into McMurdo Sound, or burned in the open air.[144] Untreated sewage is pumped into a nearby bay at a rate of 50,000 gallons a day.[145] The waters surrounding McMurdo have higher concentrations of toxic chemicals, such as polychlorinated biphenols, than most U.S. waterways.[146] The base has even had an oil spill. In 1990, more than 10,000 gallons of oil spilled from rubber bladders at the base's airfield.[147]

The United States may be the worst offender, but it is by no means the only ecological threat in the Antarctic. The Soviet station Bellingshausen has so badly contaminated a stream that it still runs rust red into the sea.[148] Britain's Signy station has polluted a local cove for 43 years, covering the seabed with trash.[149] Other nations have had mishaps similar to the U.S. oil spills.[150]

To date, the worst environmental disaster to strike Antarctica was an oil spill caused when an Argentine supply and tourist ship, the *Bahia Paraiso*, ran aground

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141. The building of an airport at the French base Dumont D'Urville resulted in a small group of islands being blown up and the destruction of penguin and pigeon breeding grounds. Susan Aldridge, *supra* note 13, at 6. *See also* Robert C. Cowen, *Keeping Antarctica Clean*, The Christian Sci. Monitor, Feb. 28, 1989, at Ideas, p.13.

142. Mike Toner, *Ecology on Ice; Waste Invades "The Last Place of Earth,"* St. Louis Post-Dispatch, Mar. 2, 1993, at 1D.

143. Alan Hall, Emily T. Smith & John Carey, *The World's Frozen Clean Room*, Business Week, Jan. 22, 1990, at 72.

144. Earl Lane, *Troubled Antarctic Waters*, Newsday, Mar. 7, 1989, at 5.

145. The base's drinking water intake is only a few hundred feet away from where the sewage enters, and some days the currents carry the sewage into the drinking water. Toner, *supra* note 142, at 1D.

146. These toxins have also been found in the tissues of penguins and seals. John Reichertz, *Environmentalist Says Nations Polluting Antarctica*, Reuter Libr. Rep., Feb. 16, 1989, *available in* LEXIS, News Library, Arcnws File. PCB levels at McMurdo are "as high as the most industrialized areas in the world." Nicholas Cater, *Antarctic Bases "Breaching Pollution Rules,"* The Times, Nov. 20, 1990, at Overseas News.

147. Smith, *supra* note 9, at A1.

148. Clarke, *supra* note 137, at A1.

149. *Id.*

150. Chile's Teniente Rudolfo Marsh has had extensive fuel spills. *Id.* Casey station, an Australian base, spilled 900,000 liters of oil when a tank burst. Victor Borquez-Fincke, *Antarctica: German Scientists Call For World Park*, Inter Press Service, May 4, 1991, *available in* LEXIS, News Library, Arcnws File.

in January of 1989.[151] The spill caused a 7.4 mile slick[152] and released 170,000 gallons of oil on the Antarctic coastline.[153] The environmental impact of the spill has been drastic. The spill seriously damaged the base of the ocean food chain.[154] Dozens of skau, Antarctic birds, died immediately, and some reacted by devouring their young.[155] The spill drove thousands of penguins from their breeding area on a rookery one-half mile away.[156] As with other forms of pollution, the polar temperatures only magnify the environmental problems caused after an oil spill. It takes many times longer for oil spills to break down in the cold Antarctic waters than in temperate latitudes.[157]

III. PROTOCOL ON ENVIRONMENTAL PROTECTION TO THE ANTARCTIC TREATY

A. Birth of the Protocol

In anticipation of the thirty-year anniversary of the Antarctic Treaty,[158] the Treaty System members negotiated the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA)[159] to supplement the original Antarctic Treaty. The goal of CRAMRA was to create an Antarctic mineral resource regime consistent with the Antarctic Treaty.[160] Ultimately, pressure from environmental groups[161] and the withdrawal of support from key nations led

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151. George de Lama, *A World Away From Alaska, An Ecological Disaster Widens*, Chicago Tribune, June 18, 1989, at C4.

152. Maria Kielmas, *Pollution Liability Rules for Antarctica To Be Considered*, Business Insurance, July 30, 1992, at 23.

153. Clarke, *supra* note 137, at A1.

154. After the spill many krill, limpets, algae, and other micro-organisms died. de Lama, *supra* note 151, at C4.

155. *Id.*

156. An Antarctic specialist speculated that many of the penguin chicks, whose first swim was through the slick while evacuating the breeding grounds, died from that swim. *Id.*

157. Pralnikov, *supra* note 16, at 19.

158. The original Treaty was subject to review after thirty years at the request of any Consultative Party. The Antarctic Treaty, *supra* note 3, art. XII(2), 12 U.S.T. 799, 402 U.N.T.S. 82.

159. 27 I.L.M. 868.

160. *Id.* at Preamble, 27 I.L.M. 868.

161. Environmental groups, including Greenpeace, characterized CRAMRA as a "miners' charter" while demanding a permanent ban on mining. Paul Hunt, *Science: Green Shield for the Ice Continent; Worldwide Pressure Could Impose a 50-Year Mining Ban in Antarctica*, The Independent, June 17, 1991, at Science and Technology p.14.

to the demise of CRAMRA.[162] Thus, after seven years of negotiating a convention that would have afforded at least some environmental protection to the continent,[163] the Treaty System was left without any means of doing so.[164] Out of the void left by the demise of CRAMRA arose the Protocol on Environmental Protection to the Antarctic Treaty.[165]

B. Relevant Provisions

1. Objectives of the Protocol

The Protocol was written in response to concerns about the potential for environmental damage to Antarctica from the activities of mankind. For that reason, the Protocol "designate[s] Antarctica as a natural reserve, devoted to peace and science."[166] To do this the Protocol makes "[t]he protection of the Antarctic environment and associated ecosystems and the intrinsic value of Antarctica . . . fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area."[167]

2. Method of Protection

The Protocol attempts to erect an environmental protection system by the use of environmental impact assessments.[168] An environmental impact assessment must be conducted for any proposed activity in "the Antarctic Treaty area pursuant to scientific research programmes, tourism and all other governmental and non-governmental activities in the Antarctic Treaty area for

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162. For CRAMRA to become effective, all seven of the claimant nations needed to sign and ratify it, but Australia and France refused to sign for environmental reasons, signaling its death. David Clark Scott, *Australia Advocates 'Wilderness' Status for Antarctica*, Christian Science Monitor, May 24, 1989, at The World p.4. *See also Antarctic Discord*, Mining Journal, Nov. 23, 1990, at 399.

163. Hall, Smith & Carey, *supra* note 143, at 72.

164. *Id.*

165. Protocol, *supra* note 4.

166. *Id.* art. 2, 30 I.L.M. 1462.

167. *Id.* art. 3(1), 30 I.L.M. 1462.

168. *Id.* art. 8, 30 I.L.M. 1464. A similar system is used in U.S. domestic environmental protection. The National Environmental Policy Act (NEPA) requires federal agencies to prepare an environmental impact statement for "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. 4332(2)(C) (1988). It was recently held that the National Science Foundation was required to fill out an environmental impact statement for activity in Antarctica. Environmental Defense Fund v. Massey, 986 F.2d 528 (D.C. Cir. 1993).

which advance notice is required under Article VII(5) of the Antarctic Treaty."[169] An assessment must also be conducted whenever there is a change in existing activity, whether an increase or decrease in intensity or the addition or cessation of an activity.[170]

Proposed activities are subject to different procedures according to their placement in one of three impact groups: "(a) less than a minor or transitory impact; (b) a minor or transitory impact; or (c) more than a minor or transitory impact."[171] An activity determined to have less than a minor or transitory impact is allowed to proceed.[172] Any impact having a minor impact or greater must undergo increased scrutiny.

Unless a determination has been made that a proposed activity will have less than a minor or transitory impact or a Comprehensive Environmental Evaluation is being prepared, an Initial Environmental Evaluation must be prepared.[173] An Initial Environmental Evaluation is completed to determine whether a proposed activity will have more than a minor or transitory impact.[174] If it is concluded from this evaluation that the proposed activity is likely to have no more than a minor or transitory impact, the activity may proceed[175] subject to procedures to verify the impact of the activity.[176]

If, by the Initial Environmental Evaluation or by other means, it is determined that a proposed activity is likely to have more than a minor or transitory impact, a Comprehensive Environmental Evaluation must be prepared.[177] A draft of the Comprehensive Environmental Evaluation must be

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169. Protocol, *supra* note 4, art. 8(2), 30 I.L.M. 1464. Those activities which require advance notice under the Antarctic Treaty include: expeditions, stations occupied by its nationals and the introduction of military personnel or equipment. Antarctic Treaty, *supra* note 3, art. VII(5), 12 U.S.T. 797, 402 U.N.T.S. 76.

170. Protocol, *supra* note 4, art. 8(3), 30 I.L.M. 1464.

171. *Id.* art. 8(1), 30 I.L.M. 1464.

172. *Id.* Annex I, art. 1(2), 30 I.L.M. 1473.

173. *Id.* Annex I, art. 2(1), 30 I.L.M. 1474.

174. *Id.* Annex I, art. 2(1), 30 I.L.M. 1474. It includes:

> (a) a description of the proposed activity, including its purpose, location, duration, and intensity; and
>
> (b) consideration of alternatives to the proposed activity and any impacts that the activity may have, including consideration of cumulation impacts in the light of existing and known planned activities.

175. *Id.* Annex I, art. 2(2), 30 I.L.M. 1474.

176. *Id.*

177. *Id.* Annex I, art. 3(1), 30 I.L.M. 1474. Article 3(2) includes:

> (a) a description of the proposed activity including its purpose, location, duration, and intensity, and possible alternatives to the activity, including the alternative of not proceeding, and the consequences of those alternatives;
>
> (b) a description of the initial environmental reference state with which the predicted changes are to be compared and a prediction of the

circulated to all parties to the Protocol.[178] A draft must also be circulated to the Committee for Environmental Protection established by the Protocol at least 120 days prior to the next Consultative Meeting.[179] A final decision cannot be made "unless there has been an opportunity for consideration of the draft Comprehensive Environmental Evaluation by the Antarctic Treaty Consultative Meeting on the advice of the Committee."[180] The decision to proceed with a proposed activity, in its original or modified form, is based upon the Comprehensive Environmental Evaluation "as well as other relevant considerations."[181]

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future environmental reference state in the absence of the proposed activity;

(c) a description of the methods and data used to forecast the impacts of the proposed activity;

(d) estimation of the nature, extent, duration, and intensity of the likely direct impacts of the proposed activity;

(e) consideration of possible indirect or second order impacts of the proposed activity;

(f) consideration of cumulative impacts of the proposed activity in the light of existing activities and other known planned activities;

(g) identification of measures, including monitoring programmes, that could be taken to minimize or mitigate impacts of the proposed activity and to detect unforeseen impacts and that could provide early warning of any adverse effects of the activity as well as to deal promptly and effectively with accidents;

(h) identification of unavoidable impacts of the proposed activity;

(i) consideration of the effects of the proposed activity on the conduct of scientific research and on other existing uses and values;

(j) an identification of gaps in knowledge and uncertainties encountered in compiling the information required under this paragraph;

(k) a non-technical summary of the information provided under this paragraph; and

(l) the name and address of the person or organization which prepared the Comprehensive Environmental Evaluation and the address to which comments thereon should be directed.

178. *Id.* Annex I, art. 3(3), 30 I.L.M. 1474.

179. *Id.* Annex I, art. 3(4), 30 I.L.M. 1474. The Committee for Environmental Protection is established under Article 11 of the Protocol. The Committee is to provide advice and recommendations to the parties at Consultative Meetings. *Id.* art. 12, 30 I.L.M. 1466. One of the functions of the Committee is to advise on the "application and implementation of the environmental impact assessment procedures." *Id.*

180. However, no decision can be delayed by this requirement for more than fifteen months after the date of circulation of the draft. *Id.* Annex I, art. 3(5), 30 I.L.M. 1475.

181. *Id.* Annex I, art. 4, 30 I.L.M. 1475. These "relevant considerations" have not yet been elaborated.

IV. PROBLEMS WITH THE PROTOCOL AND THE ANTARCTIC TREATY SYSTEM

A. Environmental Impact Assessment

1. A Lack of Clear Guidelines

One of the Protocol's deficiencies is that it contains no standards by which to determine whether a proposed activity will have less than a minor or transitory impact on the environment. The only guidance given by the Protocol is in Annex I, Article 1 which states that the "environmental impacts of proposed activities . . . shall, before their commencement, be considered in accordance with appropriate national procedures."[182] However, national procedures vary from state to state. What is "minor" or less than "minor" in one country may be more than "minor" or "transitory" in another. Given that the initial assessment of environmental impact determines the amount of scrutiny any proposed activity will receive, this is a rather important oversight. It leaves a great deal of discretion to each nation to determine its own standards as to what level of impact constitutes "minor" or "transitory." Consequently, this can lead to conflicts of interest, as nations who may have a strong desire for certain activities to proceed will be in a position to determine whether the activity will proceed immediately or if it must undergo examination by other nations. Presumably, some countries will take advantage of this by assessing the environmental impact of the proposed activity as less than "minor" or "transitory" in accordance with those nations' standards.

2. Potential Problems With Administration

The Protocol is unclear as to who ultimately determines whether a particular activity is to proceed once the amount of impact has been determined. The Protocol states that the decision is to be based upon the Comprehensive Environmental Evaluation and other relevant considerations, but there is no explicit language as to who makes this decision.[183] This leaves open the possible argument that the state proposing the activity is the body to make the decision. Yet, another conflict of interest could result, as nations which are proponents of Antarctic projects would be in a position to determine the fate of these projects.

The intended forum for judgment, however, is more likely the Antarctic Treaty Consultative Meetings. Article 3(5) of Annex I provides that no final decision can be made regarding a proposed activity unless the Antarctic Treaty

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182. *Id.* Annex I, art. 1, 30 I.L.M. 1473.
183. *Id.* Annex I, art. 4, 30 I.L.M. 1475.

Consultative Meeting has had an opportunity to consider the advice of the Committee for Environmental Protection about the draft Comprehensive Environmental Evaluation.[184] This would seem to imply that the Antarctic Treaty Consultative Parties are to make the final decision, but the issue remains ambiguous.

If the Antarctic Treaty Consultative Parties are to make the decision, there remain uncertainties not dealt with by the Protocol. For example, even if a Comprehensive Environmental Evaluation determines that a proposed activity will have a greater than minor or transitory impact, there is no prohibition against the Consultative Parties allowing the activity to proceed. In fact, there are no provisions which explicitly allow them to prohibit a proposed activity.

B. The Problem of Third Parties

Like any other contract, a treaty cannot bind a third party.[185] Thus, the provisions of the Protocol are only binding upon those nations which have signed it. Non-signing governments and non-government organizations from these countries are not constrained by the Antarctic Treaty System and may exploit Antarctica.[186] A potential remedy to this situation would be placing Antarctica under the control of the United Nations.[187] However, the members of the Antarctic Treaty System are unlikely to permit Antarctica to be taken from their exclusive control.[188]

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184. *Id.* Annex I, art. 3(5), 30 I.L.M. 1475.

185. This is the doctrine of *Pacta tertiis nec nocent nec prosunt*: treaties neither impose burdens nor confer benefits upon third states. Lord McNair, The Law of Treaties 309, 310 (1961). *See also* Vienna Convention on the Law of Treaties, art. 34, May 23, 1969, 1155 U.N.T.S. 331.

186. It could be argued that those nations which are not parties to the Antarctic Treaty System do not have the means to exploit Antarctica, because no countries outside of the System are present in Antarctica. However, there are three reasons why third parties can pose a problem to the Protocol. First, the amount of tourists visiting Antarctica each year is steadily increasing. Second, countries not presently active in Antarctica may appear in the future when and if it becomes economically feasible to extract minerals. Third, nations currently parties to the Protocol can become third parties to it by way of the Walk-Away Clause. *See infra* text accompanying notes 208-10.

187. The United Nations is a significantly larger international body than the Antarctic Treaty System. As such, placing Antarctica under U.N. control could bind a greater number of nations to a Protocol for its environmental protection.

188. *See supra* text accompanying notes 123-31.

C. Tourism

A new environmental problem developing in Antarctica stems from the increasing amount of tourism on the continent. Tourists now outnumber the scientific and logistical personnel, and the number of tourists in Antarctica is increasing substantially each year.[189] Most of these tourists arrive in the Antarctic by way of commercial cruises.[190] The tourists have left behind signs of their passage, such as garbage and even graffiti.[191] Additionally, the worst disasters arising from the presence of tourists in Antarctica have resulted from the mishaps of the carriers who take them there. The *Bahia Paraiso*[192] was carrying tourists to Antarctica in addition to supplies when it ran aground causing an oil slick. While on a detour from her normal course of passage, a German passenger ship, the *Europa*, dropped off six hundred passengers at a site of special scientific interest where they caused serious environmental damage.[193] On November 28, 1979, an Air New Zealand DC-10 crashed on Mount Erebus killing all 257 passengers and crew.[194]

In response to the perceived problem of tourists, seven cruise operators founded the International Association of Antarctic Tour Operators (IAATO).[195] These operators have made commitments to protect and preserve the Antarctic.[196]

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189. The largest percentage are American tourists. Debra J. Enzenbacher, *Tourists in Antarctica: Numbers and Trends*, 28 Polar Record 17, 19 (1992).

190. Historically, ninety-three percent of tourists arrive by boat, and in 1991, this figure reached ninety-seven percent. *Id.* at 17.

191. Michael D. Lemonick, *Antarctica*, Time, Jan. 15, 1990, at 56.

192. *See supra* notes 151-57 and accompanying text.

193. Richard Madden, *Travel: Lure of the Planet's Loneliest Spot*, Sunday Telegraph, July 18, 1993, at 19.

194. Enzenbacher, *supra* note 189, at 19.

195. The members include: Society Expeditions (Seattle, Washington), Ocean Cruise Lines (Ft. Lauderdale, Florida), Salen Lindblad Cruising (Stamford, Connecticut), Travel Dynamics (New York, New York), Adventure Network International (Vancouver, British Columbia), Mountain Travel/Sobek (El Cerrito, California), and Zegrahm Expeditions (Seattle, Washington). *Id.* at 20, 21.

196. Members of IAATO have pledged:

> (1) to be knowledgeable of and abide by the Antarctic Conservation Act of 1978 (U.S. Public Laws 95-541); (2) not to enter areas designated as sites of special scientific interest or that need special protection; (3) to operate only with qualified expedition staff of which at least 75% must have previous Antarctic experience; (4) to hire only Zodiac divers with experience in polar regions; (5) to educate passengers and crew and enforce the members' self-imposed Antarctic Visitors Guidelines; (6) to assign one qualified naturalist staff member to accompany and supervise each group of 20-25 passengers (maximum) ashore; (7) to cooperate with science stations and not disturb sites of scientific research; (8) to limit the number of passengers ashore; (9) to follow the international MARPOL treaty guidelines regarding marine pollution.

The Antarctic Treaty Consultative Parties have declared that the Protocol applies to tourists.[197] Despite this declaration, the ATCPs need to create and delineate a comprehensive system of tourist regulation.[198]

D. Enforcement Problems

1. The Liability Question

Article 16 of the Protocol deals with the issue of liability and states that the parties will "elaborate rules and procedures relating to liability for damage arising from activities taking place in the Antarctic Treaty area and covered by this Protocol."[199] However, the fact that rules for liability were not included as a part of the Protocol seriously undermines its enforcement ability. If there are no costs to parties for violating the Protocol, it is unlikely that those with financial incentives to violate it will obey its provisions.[200] There are reasons why the liability question has not been answered, but these reasons are not the great impediment they appear to be. One argument against a liability system is that such a system conflicts with an environmental protection system.[201] If commercial prospecting of Antarctica is not allowed, there is no need for a liability system. Thus, a liability system implicitly allows for resource exploitation. This argument holds little water. Even if an absolute ban on the commercial exploitation of the Antarctic is in place, violations of the Protocol could still occur requiring the responsible party to pay for their actions.[202]

Id. at 21. Another of IAATO's purposes is to lobby international legislative bodies. *Tour firms unite to keep access to Antarctica*, Chi. Trib., Oct. 6, 1991, at C17.

197. SCAR Bulletin No. 104, Jan. 1992, 28 Polar Record 92 (1992).

198. Several suggestions for handling the problems created by tourists have been made by Colin M. Harris. A reviewable license system for tour operators would handle many of these difficulties. Licenses could be renewable subject to compliance with its rules and payment of fees. An education system for tourists could be put in place, featuring brochures with articles by those with special knowledge of Antarctica as well as presentations by educated tour guides. The construction of paths and other control methods at sites of intensive use could help to protect against tourist wear and destruction. The entire tourist management system could be paid for by visitation fees charged to tourists and tour operators. Colin M. Harris, *Environmental Management on King George Island, South Shetland Islands, Antarctica*, 27 Polar Record 313, 322 (1991).

199. Protocol, *supra* note 4, art. 16, 30 I.L.M. 1467.

200. The incentives to violate the Protocol include not only the potential resources of the continent but also cost savings with respect to the disposal of pollution.

201. Ecologists argue that if there is a total mining ban, there is no need for liability rules. Rowena Whalen, *Antarctica Talks Deadlocked By World Park Debate*, Reuter Libr., Oct. 19, 1989, *available in* LEXIS, News Library, Arcnws File.

202. Incidents like the *Bahia Paraiso* oil spill and the explosion of U.S. chemicals

Another problem that officials see in a liability system is that it would require the resolution of the territorial disputes that have been frozen by the Antarctic Treaty.[203] The concern is that a liability suit requires a plaintiff to sue for the damage, and so long as there is no sovereign over an area, there is no plaintiff. This problem can easily be remedied by establishing the Committee for Environmental Protection[204] as the plaintiff in any action arising from violations of the Protocol.[205] This has two distinct advantages. First, it keeps the existing Treaty System in place by retaining the suspended status of territorial claims. Second, the money recovered by the Committee could be used to provide funds for cleanup assistance when responsible parties are financially incapable.[206]

Still another argument against imposing liability on those who violate the Protocol is that it could make research cost prohibitive. Research will inevitably result in some harm to the Antarctic environment. Those researchers who do harm the environment will be forced to pay for their damage. Consequently, researchers will be required to buy liability insurance as a normal cost of doing research in Antarctica. Liability insurance would be necessary to protect researchers from the potential for huge judgments that could be levied against them for environmental damage. Some officials believe that this extra cost will make research too expensive.[207] As a result, substantially no more research would occur in Antarctica.

Given that the very reason many researchers are attracted to Antarctica is its virgin environment, it would be ridiculous to abandon liability when it is the one way to give the Protocol some teeth by which to protect this environment. If scientists want an untouched ecosystem for research, they should whole-heartedly support a system which is designed to safeguard that ecosystem. Obviously, the Protocol needs some rules and procedures of liability to be effective.

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resulting in a forty-foot crater are not instances of commercial exploitation, yet certainly these events have occurred and liability should be imposed. Beth Marks, *Antarctic Coalition Condemns Chemical Explosion in Antarctica*, U.S. Newswire, Mar. 6, 1992, *available in* LEXIS, News Library, Arcnws File.

203. Maria Kielmas, *39 Nations Seek Antarctic Pollution Liability Accord*, Business Insurance, Jan. 7, 1991, at 39.

204. The Committee for Environmental Protection was created by the Protocol. Protocol, *supra* note 4, art. 11, 30 I.L.M. 1465.

205. This was an idea originally considered by the United States for a liability system under CRAMRA. Kielmas, *supra* note 152, at 2.

206. *Id.* at 23. Argentina has done nothing to salvage the wreck of the *Bahia Paraiso* because it does not have the financial ability to do so. Cross, *supra* note 2, at 6.

207. A U.S. official claimed that costs for liability insurance would prove unworkable for academic research such that "science would not happen." Kielmas, *supra* note 203.

2. The Walk-Away Clause

Careful reading of the Protocol reveals that there is a walk-away clause from the Protocol under Article 25. Article 7 of the Protocol absolutely prohibits any activities relating to mineral resources, except those for scientific research.[208] However, Article 25(5)(a) allows the amendment or modification of Article 7. This amendment process opens the door for parties seeking to back out of the Protocol. If an offer to amend or modify Article 7 has not been ratified within three years of its adoption, any party may withdraw from the Protocol two years after giving notification.[209] Thus, if an amendment to allow mining can garner enough support for adoption, but not enough for ratification, any country wishing to exploit the resources of Antarctica can withdraw from the Treaty System and would no longer be bound by the terms of the Protocol.[210]

3. Disregard of the Protocol

Even if mechanisms are in place to impose liability on parties for violation of the Protocol, the Protocol is useless without enforcement of the provisions by the parties. Given the history of the Antarctic Treaty System, there is good reason to be skeptical about the likelihood of parties enforcing the Protocol against violators. To build an airstrip at Dumont D'Urville, the French blew up penguin and pigeon rookeries in the process of destroying a group of small islands.[211] The French admit[212] that this was a violation of the Antarctic Treaty System,[213] but no other nation has made a formal complaint.[214] The Americans have taken disregard for the Antarctic Treaty System one step further by using 3,200 pounds of explosives to blow up chemicals near the McMurdo base just

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208. Protocol, *supra* note 4, art. 7, 30 I.L.M. 1464.

209. *Id.* art. 25(5)(b), 30 I.L.M. 1470. It reads:

> If any such modification of amendment has not entered into force within 3 years of the date of its adoption, any Party may at any time thereafter notify to the Depository of its withdrawal from this Protocol, and such withdrawal shall take effect 2 years after receipt of the notification by the Depository.

210. It is unclear what this would mean for territorial claims if one of the territorial claimants withdrew from the Antarctica Treaty System. It would certainly create a great deal of confusion. Clearly, the ATS would not recognize any new (or old) claim asserted to Antarctica because of the terms of the Antarctic Treaty. *See supra* notes 93-95 and accompanying text. In fact, uncertainty about the effect of withdrawal from the ATS on claims to the Antarctic may persuade nations with potential claims from withdrawing.

211. Aldridge, *supra* note 13, at 6.

212. Cowen, *supra* note 141, at 13.

213. Specifically, the Agreed Measures.

214. Aldridge, *supra* note 13, at 6.

three months after the Protocol was signed.[215] The result was a forty-foot crater in the ice and a blast that could be felt ten miles away.[216] The United States admits that it did not perform an environmental assessment prior to the explosion and that it should have done so.[217]

V. SUGGESTIONS & CONCLUSION

The Protocol on Environmental Protection to the Antarctic Treaty is a giant step forward in the protection of the Antarctic in that it recognizes both the present pollution problem and also the potential for tremendous future problems. Nevertheless, it still has some shortcomings that need to be addressed by the System during the upcoming Antarctic Treaty Consultative Meetings.

First, the Consultative Parties need to create definitive guidelines for making the initial evaluation as to the impact of a proposed activity. The present reliance on national procedures leaves the evaluation process open to varying national procedures and conflicts of interest. The creation of definitive guidelines for when an activity has less than a "minor" or "transitory" impact will avoid both of these problems. A useful example of a definitive guideline in an environmental impact assessment is the definition of significant used in the National Environmental Policy Act (NEPA).[218] Under NEPA, determining whether an impact is significant requires consideration of both context and intensity.[219] Obviously, a significant impact is greater than a minor or transitory impact, but the factors

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215. Marks, *supra* note 202. The chemicals were exploded because they were very unstable and could not be safely transported out of the Antarctic because they were "shock sensitive." Ellen Hale, *Explosion to Destroy Chemicals Leaves Ice Crater, Criticism*, Gannett News Service, Jan. 9, 1992, *available in* LEXIS, News Library, Arcnws File.

216. Hale, *supra* note 215.

217. *Id.*

218. 42 U.S.C. §4332(b) (1988).

219. 40 C.F.R. 1508.27 (1994). The consideration of context analyzes society as a whole, the affected region, the affected interests, and the locality. 40 C.F.R. 1508.27(a) (1994). The consideration of intensity refers to the severity of the impact. The consideration of intensity analyzes the degree to which the proposed action affects health and safety, the unique context of the geographical area, the degree to which the effects on the quality of the human environment are likely to be highly controversial, the degree to which the possible effects are uncertain or involve unique or unknown risks, the degree to which the action may establish a precedent for future actions with significant effects, the activity's relation to other activities which would cumulatively create a significant impact, the degree to which the action adversely affects areas of special interest, the degree to which the action may adversely affect an endangered or threatened species or its habitat, and whether the action threatens to violate a law. 40 C.F.R. 1508.27(b) (1994).

considered in determining whether an activity is significant can be helpful in determining whether an activity creates a minor impact. Considering the same or similar factors under a stricter standard could create uniform definitional guidelines for countries initially evaluating an activity.

The administrative shortcomings of the Protocol are more easily handled. In its present state, the Protocol is unclear as to what body determines whether an activity may proceed. Additionally, the Protocol is unclear whether the ATCPs may prohibit an activity that has been determined to have greater than a minor or transitory impact. Clarification that the ATCPs make the determination at an ATCM as to whether a proposed activity may proceed and that they have the power to prohibit the activity will remedy these problems.

A third shortcoming is that the Protocol does not protect the Antarctic environment against the actions of third parties. Given the resistance of the ATCPs to allowing the United Nations to manage Antarctica,[220] this potential solution to the problem of third parties is not likely to be utilized. There is, however, another option. The ATS currently represents every nation that has ever made a territorial claim to Antarctica, as well as all nations with potential claims. Consequently, upon agreement, the treaty members could officially hold Antarctica in trust for any and all potential claimants. This would keep in place the frozen status of the territorial claims, while providing a party to sit in the place of a landowner or sovereign, in the event that a third party did violate any of the rules of the Protocol. In any suit against a third party, the Committee for Environmental Protection could serve as the plaintiff.

The related problem of tourism has already reared its ugly head.[221] The ATCPs have declared that the Protocol applies to tourists.[222] The problem of how to deal with the tourists, however, remains. A renewable license system for tour operators has been suggested by Colin M. Harris.[223] Licenses could be renewable subject to compliance with rules and the payment of fees. Harris additionally suggests that a tourist education system could be put in place using brochures and presentations providing information about Antarctica.[224] Paths and control measures could be constructed at areas of intensive use to protect against wear and destruction.[225] The entire system could be paid for by the fees for the renewable licenses.[226]

Another area in which the Protocol in its present state is deficient is the absence of liability rules and procedures. Despite any arguments to the contrary,[227] a liability system must be put in place in order for the Protocol to be

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220. *See supra* notes 123-31 and accompanying text.
221. *See supra* notes 189-94 and accompanying text.
222. SCAR Bulletin, *supra* note 197, at 92.
223. Harris, *supra* note 198, at 322.
224. *Id.*
225. *Id.*
226. *Id.*
227. *See supra* notes 199-207 and accompanying text.

effective. The rules and procedures of a liability scheme devised for CRAMRA[228] before its demise could serve as a framework for a new liability scheme under the Protocol.

The CRAMRA liability system provided for strict liability for any damage to the Antarctic environment or its associated ecosystems that arose from mineral resource activities,[229] the loss of or impairment to an established use of dependent or associated ecosystem from such activity,[230] the loss of or damage to the property of a third party from such activity,[231] and reimbursement of reasonable costs incurred in necessary response action.[232] There was no liability for "natural disaster[s] of an exceptional character which could not reasonably have been foreseen . . ."[233] or "armed conflict . . . or an act of terrorism . . . against which no reasonable precautionary measures could have been effective."[234]

The CRAMRA liability scheme included recovery reduction for intentional or grossly negligent conduct on the part of the party seeking redress.[235] CRAMRA required each party to ensure that its courts were available for the adjudication of claims pursuant to its liability article.[236] Additionally, each state had to ensure that the Antarctic Mineral Resources Commission had a right to appear as a party in its national courts.[237]

By following the liability scheme created for mining activities under CRAMRA, the ATCPs already have a framework in place for the creation of a new liability system under the Protocol. An effective system could be produced by retaining the substance of the CRAMRA system and extending liability to cover all damages resulting from the violation of the Protocol. By increasing the scope of damaging activities for which one could be held liable and retaining the CRAMRA provisions regarding natural disasters, recovery reduction, and court access,[238] an effective liability system can be created to protect the Antarctic environment.

Another problem that the ATCPs must deal with to ensure environmental protection is the loophole created by the Walk-Away clause of Article 25. The Walk-Away clause opens the door for parties who may wish to back out of the

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228. *See supra* notes 159-64 and accompanying text.

229. CRAMRA, *supra* note 159, art. 8(2)(a), 27 I.L.M. 872.

230. *Id.* art. 8(2)(b), 27 I.L.M. 872.

231. *Id.* art. 8(2)(c), 27 I.L.M. 872.

232. *Id.* art. 8(2)(d), 27 I.L.M. 872. This action is "to prevent, contain, or clean up, as well as [provide] removal measures." *Id.*

233. *Id.* art. 8(4)(a), 27 I.L.M. 873.

234. *Id.* art. 8(4)(b), 27 I.L.M. 873.

235. *Id.* art. 8(6), 27 I.L.M. 873.

236. *Id.* art. 8(10), 27 I.L.M. 873.

237. *Id.*

238. The Protocol's Committee for Environmental Protection would replace the Antarctic Mineral Resource Commission.

Protocol.[239] The parties must get serious about their intention to protect the Antarctic environment and close this loophole by eliminating Article 25 from the Protocol.

Finally, no set of rules can be effective without enforcement. The ATS has been more than lax in its enforcement of the Protocol up to this point.[240] The Protocol must be enforced by the parties. Without enforcement, the Protocol is mere words and does nothing to protect the environment.

The Antarctic Treaty System has managed Antarctica very effectively thus far. It has avoided conflicts over sovereignty, demilitarized the continent, and has now set aside Antarctica as a preserve. If the above mentioned problems with the Protocol can be quickly resolved by the parties, a system of effective environmental protection for the seventh continent will have been created that will preserve it into the twenty-first century for our children to enjoy.

239. *See supra* notes 208-10 and accompanying text.
240. *See supra* notes 211-17 and accompanying text.