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## ANTARCTICA

Antarctica, the seventh continent, is anomalous, compared with the six inhabited continents. The usual concerns of environmental ethics on other continents fail without sustainable development, or ecosystems for a "land ethic," or even familiar terrestrial fauna and flora. A political Antarctic regime developed policy with a deepening ethical sensitivity over the second half of the twentieth century, remarkably exemplified in the Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol) at the end of the twentieth century, protecting "the intrinsic value of Antarctica," though puzzles remain about how to value Antarctica.

Without inhabitants, claims of sovereignty are problematic. Antarctica is a continent for scientists and, more recently, tourists. Both focus on wild nature. Relatively lifeless, in Antarctica life is driven to extremes. Antarctica as common heritage has come to be viewed as Antarctic wilderness. An appropriate ethics for the seventh continent has proved to differ radically from that for the other six: in some ways more eccentric, in other ways more intense.

### THE ANTARCTIC TREATY REGIME

Antarctica is governed by the Antarctic Treaty of 1959, entered into force in 1961. Originally there were twelve consultative parties (ATCPs); in 2008 there were twenty-eight. On the second tier are acceding states (ACSS), which support the treaty but do not vote. In total, some forty-four nations are involved. For the nations that can vote, decisions must be authorized by consensus. The last of the treaty's five goals is the "preservation and conservation of living resources in Antarctica." But the main concerns originally were military, shaped then by the Cold War: Antarctica will be used for peace; there will be no nuclear detonation or wastes dumped there; scientists are to exchange findings about Antarctica.

The treaty was followed in 1964 by the first of a series of annexes, the Agreed Measures for the Conservation of Antarctic Fauna and Flora, which entered into force later, in 1980. The Convention for the Conservation of Antarctic Seals (CCAS—pronounced C-cass), followed in 1972, entered into force in 1978, and was concerned about seals' "vulnerability ... to commercial exploitation" and seeking the "protection, scientific study, and rational use of Antarctic seals." Sled dogs have

been banned in Antarctica since the mid-1990s, for fear of contaminating seals with distemper.

Since 1994, the International Whaling Commission has designated Antarctica the Southern Ocean Whale Sanctuary, banning all whaling, including scientific whaling, below forty degrees south latitude. Japan, objecting, has continued to kill hundreds of minke whales a year there, claiming scientific study but also eating the whales. In 1980, entering into force in 1982, came the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR—pronounced Cam-lar). The interest, more specifically, is fish and krill. Krill, shrimp-like animals, feeding on the phytoplankton, are the basis of the oceanic food chain in Antarctic waters. Millions of tons have been harvested for food for fish or cattle or fertilizer. CCAMLR sets quotas.

The Convention for the Regulation of Antarctic Mineral Resource Activities (CRAMRA—pronounced Cram-rah), adopted in 1988, proposed rules and procedures for regulating mineral extraction. The Convention failed to enter into force, with a surprising turn. Australia and France balked at ratifying it, and, given the consensus requirement, they had veto power. Several environmental activist groups were active in opposition. The outcome, surprisingly, was the Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol), 1991, though not entering into force until 1998, when the United States and Japan ratified it. "The Parties commit themselves to the comprehensive protection of the Antarctic environment and dependent associated ecosystems and hereby designate Antarctica as a natural reserve, devoted to peace and science." There is a "50 year moratorium" on mineral exploitation in the Antarctic. There are strict sections on conservation of fauna and flora and the protection of special areas. The nations seek to keep the continent as pristine as possible.

After fourteen years of further negotiation, sometimes intense, the parties in 2005 at Stockholm adopted an annex on Liability Arising from Environmental Emergencies (Johnson 2006). This annex imposes liability for mere damage to the environment, even where there is no economic loss or damage, something novel in environmental law. This annex is viewed as a first step toward further, more comprehensive agreements about liability for environmental damages in Antarctica.

#### TERRITORIAL CLAIMS ON THE UNINHABITED CONTINENT

Seven nations have made territorial claims—Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom. Notably both the United States and the Soviet Union (now Russia) have made no territorial claims. Six of the seven claims are as sectors, pie-shaped

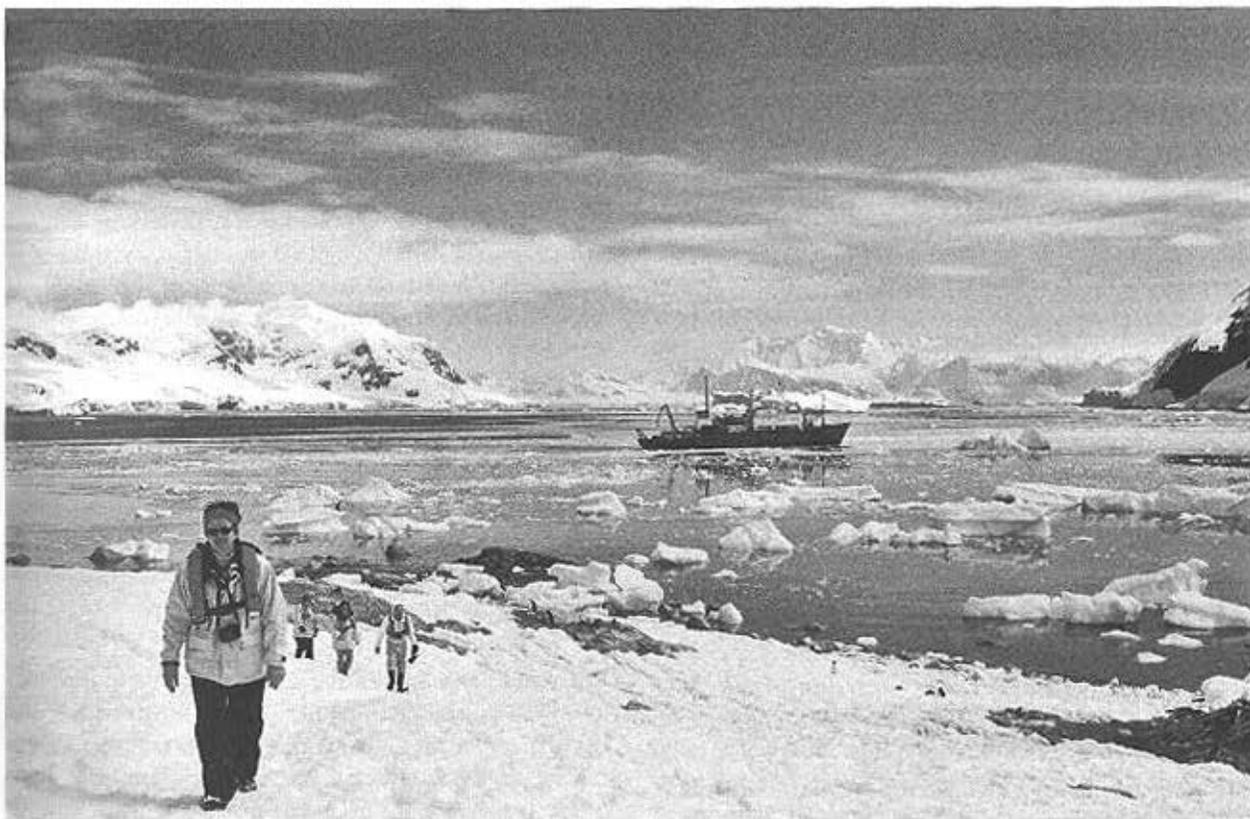
pieces widest at the coast and diminishing to a point at the Pole. The claims overlap; Britain's claims include all of Argentina's and most of Chile's. Argentina has always objected to British claims. Argentina and Chile also dispute the border between their own territories. Norway has claimed only a coastline area on which it placed huts and bases, mostly infrequently used. Though supporting the Protocol, Australia has claimed, under the United Nations Convention on the Law of the Sea, offshore rights to subsea minerals adjacent to its sector (off their 5,000 kilometer coast for 200 nautical miles).

The grounds of classical territorial claims were the colonial discovery and occupation of unoccupied lands (with Europeans typically overlooking indigenous peoples). Antarctica has been anomalously "discovered" (coastlines or ice sheets seen from ships, much of the interior seldom visited). Antarctica is only marginally land, 2 percent at the edges, or vertical rock cliffs, or bare, dry valleys, and then mostly in short summer. The continent is barely occupied. Argentina has sent women and children, families of military or scientific personnel, to a station on the Antarctic Peninsula to establish its territorial claim. The U.S. position has typically been that these lands are unsuitable for effective occupation. There is darkness much of the year; in Antarctic summer, there is continual light but the sun is never high in the sky.

Many dispute such territorial claims, arguing that Antarctica should be international. The Antarctic Treaty has held in abeyance all further territorial claims. Territorial claims can be "administrative" claims, "spheres of influence" or "stewardship jurisdictions." One way of reading what happened with the Madrid Protocol is that the environmentalists persuaded the politicians to concede that, at least for purposes of minerals extraction, nobody owns the Antarctic. Some nations have proposed United Nations administration, but this is resisted by most of the treaty regime nations. The United Nations has enough problems on the other continents and no expertise on the seventh.

#### ANTARCTIC SCIENCE AND TOURISM

Antarctic politics mixes closely with Antarctic science. A Scientific Committee on Antarctic Research (SCAR), with a secretary at the Scott Polar Research Institute, Cambridge, existed even before the Antarctic Treaty, and has since continued, regularly advising the treaty parties. Antarctic science often deals with natural phenomena found in extremes: the coldest temperatures on Earth; the most unusual environments; strange diatoms, algae, lichens. Icefish, which have no hemoglobin. Life in the Dry Valleys is embedded in rocks. Such science might reveal knowledge helpful elsewhere, particularly with regard to global climate change. Antarctic scientists



**Tourists Disembarking from Ship in Antarctica.** The highest population of people in Antarctica are tourists; during the 2006-2007 season, over 29,000 people visited the continent. The growing tourism industry has introduced both regulatory and environmental issues. The multi-nation Madrid Protocol of 1991 seeks to preserve the unique flora and fauna of Antarctica's ecosystems. ZELFA SILVA/ANTARCTICA EXPEDITION/AFP/GETTY IMAGES.

have been among its keenest conservationists. Science as such does not, however, produce an ethic—regarding whaling, or mineral exploitation, or territorial claims.

The largest groups of persons in Antarctica are the tourists, although they do not often actually set foot on the continent. Scheduled tourism started in 1966, and by 2000 included more than 14,000 persons per year. Almost all visit only the Peninsula by ship. Regulating tourism has proved difficult. The consultative treaty parties have attempted to address this issue off and on over twenty years but never acted. It was not clear whether or from whom tourists might need to get permission. Do they need passports? Visas?

Nothing in the Antarctic Treaty or international law requires asking permission of anybody. None of the territorial claimants requires visas to the Antarctic. Even if they did, these claims are disputed, even among the claimants, and the tourists remain mostly on their ships, there presumably under the law of the nation whose flag the ships are flying, or under the Convention on the Law of the Sea. Generally tourist companies get permission

from the government of the country where the company is based, or, sometimes, the country from which most of the tourists come.

Such uncertainties might as easily avoid regulation as enforce it. U.S. nationals are the largest component of tourists (about half), but of some fifteen ships cruising there, two-thirds travel under flags of convenience. The U.S. Environmental Protection Agency has ruled that U.S. commercial operators must submit environmental documentation for review. Increasing numbers of tourists visiting Antarctica find a no man's land, no immigration officials, no customs authorities, reinforcing the idea that Antarctica is stateless.

The International Association of Antarctica Tour Operators (IAATO) released their own "code of conduct" for visitors, evidently sensitive to respect for wildlife, a do-not-interrupt-and-leave-no-trace ethic. "Antarctica, the world's last great wilderness, is particularly vulnerable to human presence. Life in Antarctica must contend with one of the harshest environments on earth, and we must take

care that our presence does not add more stress to this fragile and unique ecosystem." "Do not disturb, harass or interfere with wildlife." "Give animals right of way." At the 2007 Antarctic Treaty Consultative Meeting (ACTM) the treaty parties essentially adopted IAATO's operating strategy after sixteen years, as ATCM Resolution A (2007), though this resolution is less stringent than IAA-TO's bylaws and the code of conduct there.

Many argue that tourism should remain ship-based. Tourism ought never to move on land, except for transient expeditions. Project Antarctic Conservation, a research team from the Scott Polar Research Institute, was formerly monitoring Antarctica tourism (Stonehouse 2000, pp. 264-267). The Madrid Protocol indicates that any citizen of a country that has ratified the protocol should have, or be traveling with a tour operator that has, a permit based on an environmental impact assessment filed with their home Antarctic authority. The U.S. Congress and courts have held that the National Environmental Policy Act applies to Antarctica.

#### ANTARCTIC WILDERNESS, COMMON HERITAGE, WORLD PARK

Environmental ethics for Antarctica—so the argument is increasingly developing—is about Antarctic wilderness. Antarctica is not a political place, and it is a mistake to try to make it one. On the uninhabited continent, one should not apply criteria from other continents. We are not seeking sustainable development, a land ethic, one of people in harmony with their landscape, or protecting natural capital, or ensuring that future generations have as much opportunity for development as do we.

Subantarctic islands have noticeable human interruptions, even human habitations. But a typical square hectare of the continent has seldom, if ever, had a human set foot on it. There is science, but what the scientists are studying is wild nature. There is tourism, but the tourists take pleasure in seeing, again, wild nature. On the seas, the shores, on the Peninsula, one needs an ethic for wildlife, for penguins and seals, lichens and mosses. But fauna and flora go into a bigger, wilder picture. Antarctic wilderness features the desolate and empty. When NASA wanted to simulate the surface of Mars, they went to the Dry Valleys. The expanses of the continental interior, even after being mapped, are little more than white spaces on the map.

The ethic needs to respect where life is found, but beyond that, is more like that for canyons, mountains, rivers, or caves. One conserves Mount Everest as the highest point on Earth, although the highest thousand meters is lifeless and has no ecosystem. The lowest point on Earth, the Dead Sea, also a difficult place to live, seems less commanding. The Barwick Valley in Victoria Land is protected from nearly all visits because it is one of

the most nearly sterile areas on Earth. On Antarctica there are also places designated for particular protection, Sites of Special Scientific Interest (SSSIs) and Specially Protected Areas (SPAs), the latter isolated even from scientific activities. In 2002, such areas were grouped together as Antarctic Specially Protected Areas (ASPAs).

Humans ought to conserve the geysers in Yellowstone National Park, though we usually do not think that we have duties directly to non-living natural phenomena (geysers, waterfalls, cliffs, clouds), so much as to people who enjoy them. There are no duties directly to glaciers or icebergs. But Antarctic places, some of them at least, have site integrity; something makes them special, notable. Mount Erebus in Antarctica is majestic. We respect the Delicate Arch in Utah, the crystals in Mammoth Cave in Kentucky, unusual achievements in nature. Once we move past respect for life, environmental ethics needs some further account of where the values lie that command our respect.

Perhaps the ethic will be mostly directed to life in Antarctica. This will be as much toward life in extremes as toward any biodiversity hotspots, as might be the case elsewhere. On the Subantarctic islands, fauna and flora can be abundant. But on the Southern continent itself one is first struck by the barrenness of the land and ice contrasted with the teeming waters of the Southern Ocean. What wildlife there is is really marine life that uses the coastal edges for nesting or resting, typically not for feeding.

There are no native land animals, not at least as characterize other continents. Antarctica's native terrestrial animals are all invertebrates, mostly arthropods, such as mites, lice, springtails, and midges, many of which are parasites of seals and birds. Much is microscopic: protozoans, rotifers, nematodes, tardigrades, bacteria. The largest animal that really dwells on the land is a wingless midge (*Belgica antarctica*), only two to six millimeters long, which spends all but two months of its two-year life cycle encased in ice and mostly frozen. Animal welfare or rights ethics will be needed mostly only in the waters, for the whales and seals. Although there is life in the nooks and crannies of the continent, there are almost no higher flora, two species on the Peninsula (a grass, *Deschampsia antarctica*, and a pearlwort, *Colobanthus quitensis*), and none south of the Antarctic circle. Mostly the flora is lichens, 350 species, 100 species of mosses, and hundreds of species of algae.

An ecosystemic ethic will find rather simple ecosystems in terms of food-webs, stratification of organisms, mineral cycling, and primary productivity. There is rather little predation, but some: a mite eating a nematode worm. Food chains are short. Decomposition and nutrient turnover are slow. The terrestrial/ice system is

not productive enough to support higher animals. Such ecosystems are fragile, easily stressed, disturbed by introduced exotics or wastes, and slow to recover from human interruptions. That means that scientists and tourists will need to take extra care.

Some argue that the most plausible answer is to go back to people. The best model is that of World Park Antarctica. This is not Yellowstone or Yosemite; this would have to be an atypical park, but maybe the "park" idea is moving in the right direction. Since 1972, the World Conservation Union (IUCN) has advocated designating Antarctica some kind of World Park, as have the Antarctic and Southern Ocean Coalition, Greenpeace, the Jacques Cousteau Society, and other non-governmental organizations. The World Wilderness Congress in 1987 called for a World Park. A wilderness park will involve the idea that people do not remain and that the landscape displays primarily the processes of spontaneous nature, but it does connect up with people, who must visit for Antarctica to be a park. Antarctica does have surprising aesthetic value.

#### ENVIRONMENTAL ETHICS AT EXTREMES

In Antarctic wilderness, people get let in on nature's show, whether icebergs or penguins, and that happens with particular intensity on this uninhabited continent, a continent of extremes. Another way to think of this is that environmental ethics, like the life there, is also driven to extremes. The further south one goes, the more life disappears; even lichens and algae cannot survive. On land and in ice, life at its edges challenges the ultimate limits—down in rocks in the Dry Valleys, with microbial colonies 200,000 years old (a hundred times older than a redwood tree), on a landscape where no rain has fallen in two million years, and it is now too dry to retain snow. "Endolithic life," as the biologists term it, is algae, bacteria, and fungi inhabiting the spaces between grains in rocks. There are microbes at the South Pole. There is life in the deep freshwater lakes, perhaps even in Lake Vostok, under two miles of ice and not exposed to the atmosphere for a million years, since before *Homo sapiens* appeared on Earth. Recent research has found that forms of both plant and animal life there have survived glacial cycles over millions of years.

Respect for life is not gone; rather, respect goes to extremes with these achievements. The really exciting science here is about nature irrelevant for people—microbes at the Pole or hemoglobin-less fish. Such science might bring us a deeper respect for life, more resolution to leave no human imprint. This life is "untrammled by man"; that is fact of the matter. Problematic though the transition from *is* to *ought* is, scientists, policymakers, and

environmental ethicists have been forming a consensus that in Antarctica humans ought to let life already at the limits continue untrammled. The wonder of life at the limits of possibility commands our respect.

Here is nature revealed in the wildest: the southernmost penguin colonies, the densest feathers, penguins that live on ice and need never touch land. We respect remote oceanic islands or desert canyons, with odd forms of life, or little life at all. Life pushing into those extremes does deserve human respect when we encounter it, and demands more vigilance, lest we disturb it, Antarctica is a "wonderland."

#### GLOBAL ANTARCTICA

Antarctica is at once unique and global, combining both particular and universal dimensions. Antarctica will not solve the population problem; it holds no answers to global warming (although this may be monitored there), or to the loss of biodiversity, escalating consumerism, or sustainable development. But this stateless continent could be a pace setter for an ethic of the common heritage of humankind, rather slowly developing on the other continents, with some 170 nation states. Typically the nations presently in control in Antarctica have denied that the common heritage principle applies here, but this denial seems increasingly implausible with the resolution not to develop the continent.

The protocol states: "The development of a comprehensive regime for the protection of the Antarctic environment and dependent and associated ecosystems is in the interest of mankind as a whole." One way of reading that is that this continent belongs to nobody because it belongs to everybody. But other interpreters wish to turn that idea on its head and take "belonging to nobody" to mean more precisely what it says: no humans, individually, nationally, or internationally, own this place. Human ownership is not the relevant category. The Madrid Protocol seeks to protect "the intrinsic value of Antarctica, including its wilderness and aesthetic values." It is impressive to have a consensus of several dozen nations resolved to protect what they call the intrinsic value of Antarctica. In Antarctica, in the protocol, the nations have reached a transcultural, even a global ethic. If this is still a pragmatic ethic, Antarctica for science, tourists, and future generations, this pragmatism has convictions about Antarctic nature independently of the human presence.

Antarctica is particularly challenging because here is the one continent on the home planet that is not, cannot, and ought not be our home.

SEE ALSO *Ecotourism; Environmental Law; Global Climate Change; Oceans; World Wide Fund for Nature.*

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