promote an issue which lies close to my heart. And I have a dream: that one day, not only will people of all colors and genders learn to walk together in equality, but that they learn to walk without trampling the grass beneath their feet. That they learn to treat this earth on which we all live with just a little more respect. That they learn to stop stealing from their children and preserve scarce resources for the future. Past generations have made some progress in this direction, but it is much too slow. Too slow to stop the many harms we continue to inflict daily upon the land. I can only hope that my children's generation proves faster and wiser than mine -- for all our sakes.

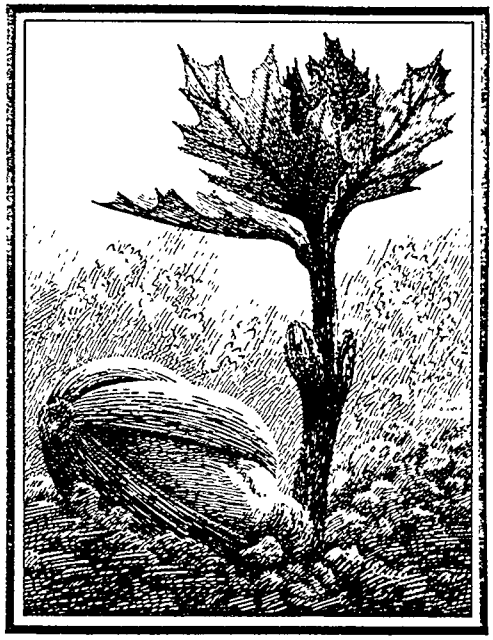
So please, read ENVIRONS. Because I firmly believe that the key is understanding. If nothing else, understanding how much we really still do not know. We pride ourselves on what little knowledge we have obtained while wallowing in ignorance thick and black as tar. And as difficult to remove. Some claim what we don't know won't hurt us. I say it will. But only our children will know the answer, and by then it's too late for all of us.

One day I hope everyone understands what part the human race plays in the environment. Until then, ENVIRONS' goal is to help us all understand our environment just a little better. And hopefully, this issue will start us down the path to a cleaner, safer environment. Before it's too late.

Enjoy!

Cynthia Patton
Editor-in-chief

P.S. -- In case you missed my subtle hints, ENVIRONS still desparately needs your generous donations. Won't you please consider a basic subscription or an additional donation? The appropriate form is located at the back of the issue. Thank you.



The Antarctic Minerals Convention: Opening Pandora's Box?

by Ruth Berkowitz and Jeff Swanson

INTRODUCTION

Mention Antarctica and many people have images of a distant world consisting solely of penguins, blue ice, and cold temperatures. Yet Antarctica consists of much more than this commen mental image. Located south of 60 degrees South latitude, Antarctica is a remote and inhospitable continent which no individual or country owns. Dedicated to peaceful purposes, scientists use Antarctica as a pristine laboratory; politicians praise its international cohesion; environmentalists cherish it as the world's last true wilderness. Yet Antarctica's remoteness and inhospitable terrain can no longer protect it from commercial exploitation. Scientists believe that Antarctica contains a wealth of minerals. The Transantarctic Mountains may yield deposits of coal, copper, lead, zinc, and silver. The Prince Charles Mountains contain iron ore, and individuals have located gold, chromium, nickel, cobalt, tin, uranium, and titanium. Experts also speculate that beneath the continent lies billions of barrels of oil. The Gondwanaland theory of continental drift holds that Antarctica was once united with India, South America, Australia, New Zealand, and Malagasy, and thus, has similar geological composition to those regions. If so, Antarctica should have a wealth of exploitable resources.

Balanced against this prospect of great mineral wealth are the difficulties and consequences of extracting minerals. Antarctica's geography and climate pose considerable technological and financial obstacles to developers. Ice an average thickness of one mile covers ninety five percent of the continent's landmass. Mining in antarctic temperatures and wind conditions requires sophisticated machinery. Offshore, icebergs the size of small mountains and pounding waves can easily demolish oil rigs and tankers. Further, the distance to markets, collossal transportation problems, the lack of an industrial infrastructure, and numerous other logistical barriers

all make commercial development in Antarctica a high risk venture.

Despite the apparent difficulties, parties to the Antarctic Treaty (the continent's governing doctrine) began to study the possibilities of commercial mineral exploitation and its effect on the region's politics, economics, and environment. On June 2, 1988 at Wellington, New Zealand, thirty three of the thirty seven Antarctic Treaty nations established a legal framework for prospecting, mining, and drilling on the Antarctic continent. The treaty nations adopted by concensus the Convention on the Regulation of Antarctic Mineral Resource Activities after six years of formal negotiations. Convention on the Regulation of Antarctic Mineral Resource Activities, June 2, 1988, opened for signiture Nov. 25, 1988, 27 I.L.M. No. 4 (July 1988) [hereafter Convention]. Opened for signature on November 25, 1988, the Convention will enter into force thirty days after approval by sixteen Antarctic Treaty nations. If ratified, the Convention will become a part of the Antarctic Treaty system alongside the Antarctic Treaty.

Signed by 37 countries in 1959 and enacted on June 23, 1961, the Antarctic Treaty broke new ground in international relations and marked a thawing of the Cold War. The Antarctic Treaty's Preamble states that Antarctica "shall continue forever to be used for peaceful purposes and shall not become the scene or object of international discord." The Treaty embraces six important principles which many consider milestones in international affairs:

* Antarctica's use for peaceful purposes only,
* the continuation of scientific investigation freedom,
* the exchange of information and personnel,
* the suspension of all territorial claims for the Treaty's duration,
* the banning of nuclear explosions and radioactive waste disposal,
* Treaty parties' free access to observe and inspect all stations and equipment.

The Convention represents the international community's first effort to address the legal issues involved in the development and exploitation of Antarctica's oil and minerals. The Antarctic Treaty itself is silent on the issue of mineral exploitation. For the last eight years, however, countries have abided by an informal development moratorium.

The Convention releases virtually all of Antarctica, except certain protected areas, to regulated oil and mineral resources development. As soon as the treaty nations ratify the agreement, prospecting for oil and minerals using seismic testing and other techniques can begin. Full-scale exploration and subsequent development will commence when a new commission is set up under the Convention to oversee those activities.

This article contains two principal sections. Part One discusses the Convention in detail. Part Two analyzes commercial exploitation's potential effects on Antarctica's environment and politics.

THE CONVENTION

The Convention's Preamble hints at the drafters' conflicting intentions. The Preamble notes "the possibility that exploitable mineral resources may exist in Antarctica" and simultaneously recognizes "that Antarctic mineral resource activities could adversely affect the Antarctic environment or dependent or associated ecosystems." Convention, *supra,* at Preamble. Acknowledging the potentially devastating effects of mineral development on the environment, the Convention drafters state "that the protection of the Antarctic environment... must be a basic consideration in decisions taken on possible Antarctic mineral resource activities." *Id.*

Similar ambiguous wording in reference to the environment appears throughout the Convention. Such wording greatly weakens the Conventions's potential for environmental protection. For example, Article 2, section 2 of the Convention (Objectives and General Principles) states, *inter alia*, that:

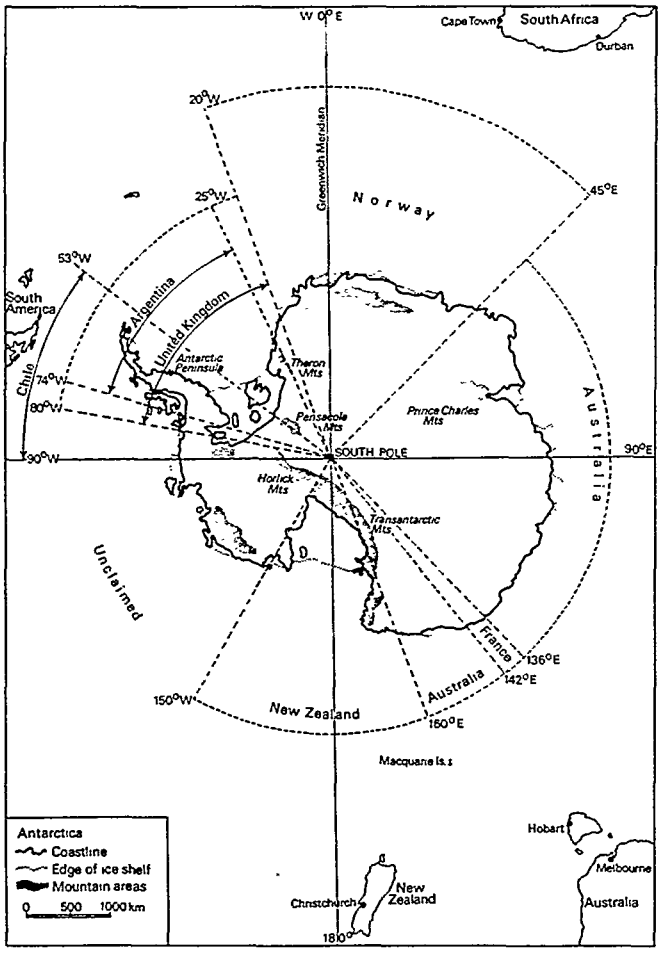
> No Antarctic mineral resource activity shall take place until it is judged ... that the activity in question would not cause: (a) significant adverse effects on air and water quality; (b) significant changes in atmospheric, terrestrial, or marine environments; (c) significant changes in the distribution, abundance, or productivity of populations of species of fauna or flora.... Convention, *supra*, Art. 2, § 2.

Other "environmental protection" sections contain similar qualified phrases such as "in so far as it is feasible" or "to the extent possible." Who determines what is feasible, possible, or significant? "Feasible" and "significant" mean one thing to an environmentalist and something entirely different to an oil or mining company.

The Convention establishes three types of governing bodies to handle these and other questions: a commission, various regulatory committees, and an advisory committee. The commission, which consists

of all the Antarctic Treaty's voting members, governs the Convention and decides what areas to open for commercial activity. The regulatory committees approve management schemes, issue exploration and development permits, and oversee all mining activity. The regulatory committees consist of ten members each. Eight of the ten positions rotate between different treaty nations, and the United States and the Soviet Union permanently hold the remaining two positions. The United States and the Soviet Union hold these seats because they maintian the largest scientific presence in Antarctica. The advisory committee, open to all Convention parties, advises the commission and the regulatory committees on the scientific, technical and environmental aspects of development activites in Antarctica.

On the surface, this approach seems to efficiently ensure environmental protection. In reality, however, the plan does little to protect the environment. For example, regulatory committee memebers may also have interests in securing their own exploration and development permits. As a result, they may feel less inclined to deny other permit applications for fear of having their own denied. In addition, the advisory committee's recommendations are not binding or enforceable, and they are made only at the commission or a regulatory committee's request.



Map of national claims in Antarctica

The body of the Convention formalizes the Antarctic resources exploitation process. The Convention begins by defining permissable activities. Prospecting, which requires only that a sponsoring nation grant permission to a corporation or "operator," involves activities "aimed at identifying areas of mineral resources potential for possible exploration and development." Convention, *supra*, Art. 1, § 8. The Convention limits prospecting activities such as dredging and excavations to obtain "small scale rock samples" and limits drilling to less than 25 meters into the sediment. To begin prospecting, the sponsoring nation must notify the commission about the prospecting site's location and provide details regarding the operator.

If after prospecting, an operator wants to do full-scale exploration, then the operator must submit a proposal "requesting that the commission identify an area for possible exploration and development of a particular mineral resource or resources." Convention, *supra*, Art. 39, § 1. Exploration involves activities "aimed at identifying and evaluating specific mineral resource occurrences or deposits, including exploratory drilling, dredging ... and other ... excavations required to determine the nature and size of mineral resource deposits and the feasibility of their development.... Convention, *supra*, Art. 1, § 9. Exploration also includes major blasting, which in the past has devastated wildlife.

While an exploration permit remains valid, a sponsoring nation may submit to the regulatory committee an application for a development permit. The committee then meets "as soon as possible" to determine whether the application fulfills the Convention's requirements. The Convention requires a description of the development plan, a detailed environmental impact assessment, and an operator recertification by the sponsoring nation. Development itself is defined as activities "which take place following exploration and are aimed at or associated with exploitation of specific mineral resource deposits ... including ... processing, storage and transport activities." Convention, *supra*, Art. 1, § 10.

Prospecting, exploration, and development in Antarctica's desolate and hazardous environment increase the risks of danger. In anticipation of accidents, the Convention contains developer liability provisions. Article 8 states that operators shall be strictly liable for "damage to the Antarctic environment" or any associated ecosystems arising from development activities. This liability presumes complete environmental restoration and payment when the developer cannot achieve such restoration. The Convention does not specify, however, how much the developer must pay or how to calculate such payments. In addition, the Convention does not apply strict liability when "natural disaster[s] of an exceptional character" or acts of war or terrorism cause the environmental damage.

The Convention states that a separate protocol with respect to liability shall be established some time after the treaty nations ratify the Convention. These

additional rules and procedures may include provisions further limiting liability "where such limits can be justified." Convention, *supra*, Art. 8, § 7(c)(i). The future protocol will establish a claims tribunal through which plaintiffs may bring claims against operators. At this time, no such tribunal exists, and until the treaty nations adopt the additional rules, the Convention lacks the essential means to enforce any liability provisions.

Article 64 constitutes a final Convention component worthy of attention. Article 64 deals with the amendment process. Section 1 states that the Convention "shall not be subject to amendment until after the expiry of 10 years from the date of its entry into force." Convention, *supra*, Art. 64, § 1. Consequently, any inadequacies and ambiguities existing at the time of ratification will remain for at least a decade.

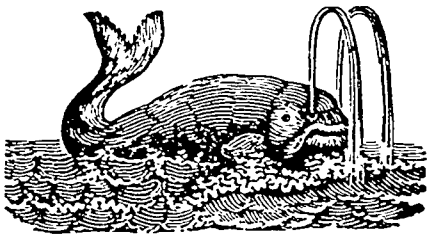
THE CONVENTION'S EFFECTS

Oil companies are anxious to begin minerals exploration in Antarctica. A Texas company may already possess the technology needed to drill in the Antarctic. "Exploratory drilling will be feasible although difficult ... the technical expertise, ultimately, is available. The sole hindrance is jurisdiction -- from whom do we get a drilling permit?" St. John, *Antarctica -- Geology and Hydrocarbon Potential* 96 (1987) (report for Primary Fuels, Inc., a Houston Industries Inc. subsidary). The Convention provides the legal avenues needed to obtain permission to explore the continent's resources. Thus, Antarctica teeters on the brink of commercial exploitation.

Mining and drilling have not yet begun in Antarctica, but once exploitation begins, the environment will suffer and the region's politics and legal framework will change. Development simultaneously threatens the continent's ecosystem and the Antarctic Treaty's philosophy of international harmony. Nations may cease to observe the Antarctic Treaty's moratorium on claims and its free exchange of scientific information and personnel when operators discover valuable minerals on "their" territory.

A. Environmental Effects

What are the likely environmental impacts of resource exploitation in Antarctica? On land, developers have considered utilizing open pit mining, underground mining, and solution mining, leading to environmental degradation. Mines will displace thousands of tons of soil and create huge amounts of spoil and waste rock. At sea, developers have considered oil drilling and shipping, increasing the possibility of oil spills. These and similar activities will endanger the biological communities at land and sea, the surface terrain, the subsurface environment, and the atmosphere. According to a 1977 environmental impact report, "the terrestrial ecosystems will suffer severe local impact and, in most cases, total destruction in areas where mining activity takes place." A Framework for Assessing Environmental Impacts of Possible Antarctic Mineral Development, Nat'l Tech. Info. Serv., Docs. PB-



262750, PB-262751, part I, VII-4 (1977) [hereafter Impacts].

Because of Antarctica's sensitive environment and its slow rate of recovery, any surface modification will have a tremendous impact. Therefore, mining activities will prove especially harmful. Unique vegetation and soils, the result of thousands of years of evolution, "will not be regenerated, if at all, in any less time than they took to form." Impacts, *supra*, at VII-7. Mining activity will displace or destroy wildlife in the vicinity. Marine environment degradation will occur when mine operators dump mine tailings and waste rock into the water, the effects being especially severe in bays and other areas of low-level circulation. These sediments, which "would probably include trace metals and various chemicals used in processing the ore" would blanket organisms living on the seabed. *Id.* at IX-2. "Trace elements, both heavy metals and non-metals like arsenic, released into the marine environment as a result of mining and ore processing may be taken up by organisms ... [but] the long-term cumulative effects are, by and large, unknown." *Id.* at VII-5.

Providing the support personnel needed for mining activities will also have considerable environmental impact. Isolated from the rest of the world, Antarctica has no indigenous human population, no trees, and no natural resources, except for fresh water, to provide for the immediate needs of the persons working there. All food, goods, and building materials must be imported. Support personnel must construct roads, airstrips, buildings, storage space, holding facilities, processing plants, docking facilities, power plants, and housing. These activities not only require alteration of the environment, but also pose personal risks. Workers must become qualified to survive the dangers of Antarctica where accidents and the threat of major disasters loom large. Potential sources of tragedy include hidden crevasse fields, unpredictable weather, and fires -- Antarctica's worst enemy because of its dry climate.

Because ice covers ninety eight percent of the continent, few areas in Antarctica are suitable building sites. Wildlife usually inhabits these few ice free areas. Construction will displace penguin rookeries and seal breeding grounds. When the French built their airstrip station, Dumont d'Urville, within three hundred yards of a penguin rookery, workers bombed the area to clear the land, killing many penguins. The airstrip cut off those penguins not killed from access to the water.

Commercial activities mean more people, and more people mean more pollution. In Antarctica,

garbage takes years to deteriorate because of the continent's low bacteriological activity rate. A prevalent issue for all personnel working in Antarctica, waste disposal has caused many environmentalists to complain. The 1977 environmental impact report recognizes this problem and states the need to properly dispose all waste -- possibly off Antarctica. *Id.* at VII-19.

The greatest potential for environmental disaster comes from seaborne transportation and ocean drilling. Vessels' discharge of hydrocarbon laden bilge pump and ballast waters, as well as the unavoidable loss of crude oil when transfer to tankers occurs, will have extensive cumulative effects. A single oil rig "blow out" or tanker loss at sea could devastate wildlife. An oil spill would adversely affect swarms of krill, a small shrimp-like crustacean, which have a vital role in the simple Antarctic food chain. Baleen whales, fish, squid, seals, birds and diverse zooplankton, all feed on krill. Because of krill's central role in the food web, an accident affecting a krill swarm has "the potential of simultaneously affecting all elements and levels of the antarctic marine ecosystem in the region of their occurrence." *Id.* at H-13, H-14.

Oil spills could affect avian populations, all of which depend exclusively on marine life for food. In addition to a depletion of the food supply, "oiling of the feathers will, in most cases, lead to the death of the bird and therefore both accidental oil spills and deliberate discharge of tanker ballast, bilge oil, etc., are likely to cause high rates of mortality." *Id.* at VII-6. Moreover, "coastal currents can potentially contaminate distant in-shore waters, ice faces, and adjacent and downwind, on-shore rookeries." *Id.* at H-23.

No matter how careful developers proceed, commercial development will adversely affect Antarctica. Further, despite the Convention's strict liability policy, money cannot repair the environmental damages.

B. Legal and Political Effects

The Convention and its approval of mineral exploitation threatens the Antarctic Treaty's basic principles. Mineral exploitation directly threatens several of the Treaty's progressive principles -- in particular, the suspension of territorial claims and the freedom of scientific investigation. The possibility of minerals exploration has already caused international uproar, jeopardizing Antarctica's peaceful status. In fact, some theorists claim that the 1982 war between Argentina and Britain over the Falkland Islands, located 800 miles north of Antarctica, occured partly to enhance claims to Antarctica's minerals. Burrough, *Polar Predicamentt: If Antarctic Oil Search is a Success, Pollution, Discord May Follow*, Wall Street J., Dec. 9, 1985, at 1, col. 2.

In the United Nations, Malaysian Prime Minister Dato' Seri Mahathir bin-Muhammad denounced the Minerals Convention. Platt's Oilgram News, Oct. 6, 1988, at 3. The United Nations currently considers governing the entire region to ensure that Antarctica remains a "Common Heritage of Mankind," absent private or national ownership. Countries such as Malaysia support the Common Heritage approach because they cannot afford to develop in Antarctica or believe that if exploitation occurs, developers should distribute the wealth evenly. Mining companies, however, would have little incentive to invest in Antarctica if they would not have title to the resources they extracted. Instead of a

Instead of a Common Heritage plan, environmentalists advocate a "World Park" solution as a means of protecting Antarctica from mineral exploitation. "Conservationists say the potential finite benefits of Antarctica's mineral resources are not worth the risk of polluting this fragile ecosystem." Christian Sci. Monitor, June 7, 1988, at 9, col. 1. Under this proposal, protection of Antarctica's wilderness and wildlife would have the highest priority. The continent would be preserved exclusively for peaceful purposes, with limited scientific activities and no mineral exploitation.

Chile, Argentina, and many other claimant nations who want exclusive mineral rights oppose these concepts of collective ownership. These countries may consider pressing their territorial claims despite the Antarctic Treaty's moratorium. Seven nations claim pieces of the continent: Argentina, Australia, Chile, France, New Zealand, Norway, and Great Britian. Chile, Argentina, and Great Britian's claims overlap. (See map on p. 6). Neither the United States nor the Soviet Union -- the countries with the largest Antarctic operations -- have established claims, nor do they recognize the validity of other's claims. Yet once commercial exploitation begins in Antarctica, the claimant countries may no longer accept the Antarctic Treaty's moratorium on claims. When exploitation becomes a reality, the controversial questions of legal status and jurisdiction may destroy the delicate balance existing between treaty nations.

C. Scientific Effects

In addition to jeopardizing the cooperative spirit between the Treaty nations, the Convention interferes with on-going scientific efforts. Currently, scientific research constitutes the principal activity in Antarctica. Antarctic research in atmospheric sciences, biology, biomedical sciences, earth sciences, ecology, glaciology, and ocean sciences is vital to understanding global environmental systems, such as the ozone layer, world ocean circulation, and portents of the "greenhouse effect." The Convention may stimulate Antarctic Treaty members to channel their money, personnel, and time away from scientific research and into finding feasible ways to extract and exploit minerals.

This change of focus contradicts the fundamental values embodied in the Antarctic Treaty. The Treaty recognizes scientific research's importance in Antarctica and aims to protect and encourage it. Articles 2, 3, and 7 of the Antarctic Treaty guarantee freedom for scientific investigation and the exchange of personnel and scientific observations. Scientific

cooperation between all the nations currently exists, but with a shift of emphasis to mineral exploitation, the cooperative relationship will undoubtedly suffer.

CONCLUSION

Similar to other development strategies, the Minerals Convention drafters attempted to balance environmental concerns with economic and national interests. Environmentalists believe the Convention's agreement to allow exploitation, no matter how rigid the rules, constitutes a defeat. Their ideal solution would guarantee a continent untouched by economic development. According to Greenpeace representative Dana Harmon, "most environmentalists agree that the Minerals Convention will do a lot more to encourage commercial activities than to protect Antarctica from wanton exploitation." Harmon, *Minerals Negotiations: A Pandora's Box*, 13 Greenpeace, Sept./Oct. 1988, at 10.

Convention proponents argue that the Convention's legal framework provides adequate environmental safeguards. According to Chris Beeby, chairman of the treaty conference, the Convention would protect Antarctica from an "unregulated scramble" if anyone ever discovered mineral deposits in commercially extractable quantities. Daily Report for Executives, June 7, 1988, at 1.

Beeby states that the Convention is "an historic occasion which [he] believe[s] will go down in Antarctic history as the most important political development regarding the regulation of Antarctica since the Antarctic treaty itself was adopted in 1959." New York Times, June 8, 1988, at A15, col. 6. Indeed, the Convention has great importance. The new minerals regulations may lead to the destruction of the Antarctic Treaty nations' cooperative relationships. No longer will Antarctica be a continent dedicated to science and peaceful coexistence. No longer will Antarctica be the world's unblemished frontier. As Sir Peter Scott, son of the famous explorer Sir Robert Falcon Scott, wrote in a letter to the Minerals Convention delegates:

> Antarctica stands at the crossroads. If the minerals convention is signed and brought into effect in its present form it will mean that human greed, the desire for short-term profit, the urge to conquer new frontiers at whatever the cost to the environment, will triumph yet again. It will mean that the devastation wrought over virtually the whole of the rest of the globe is likely to spread to the last wilderness. Antarctica represents the last chance we have of proving that we really will change our ways and begin living in harmony with the planet.

The Minerals Convention may signal that we have learned nothing from our past environmental mistakes and that Antarctica will eventually fall prey to economic interests. The Convention members must take responsibility to look beyond quick economic gains and recognize that Antarctica's present value far exceeds the sum of its exploitable assets.

ACKNOWLEDGMENTS

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