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ANTARCTICA:

Chile's Claim



The mysteries of the Antarctic are protected by its enormous ice masses, typified by this crevasse. An object of concern because of its vast resources, especially minerals, the Antarctic Continent covers an area roughly the size of the United States and Europe combined. It is the only area on the globe where 39-or-so nations are working together in peace and harmony, through an international treaty that comes up for reconsideration in the year 1991.

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ANTARCTICA:

Chile's Claim

Brigadier Luis S. Mericq, Army of Chile

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Foreword

Antarctica is commonly viewed as a barren, inaccessible, frozen land, but, in fact—as this study shows—the southernmost continent is a productive laboratory for scientific research, one rich in natural resources like oil, natural gas, and high-grade gold ore, and one of the few places on the globe where nations of conflicting ideologies and different levels of development are working in harmony and sharing scientific knowledge.

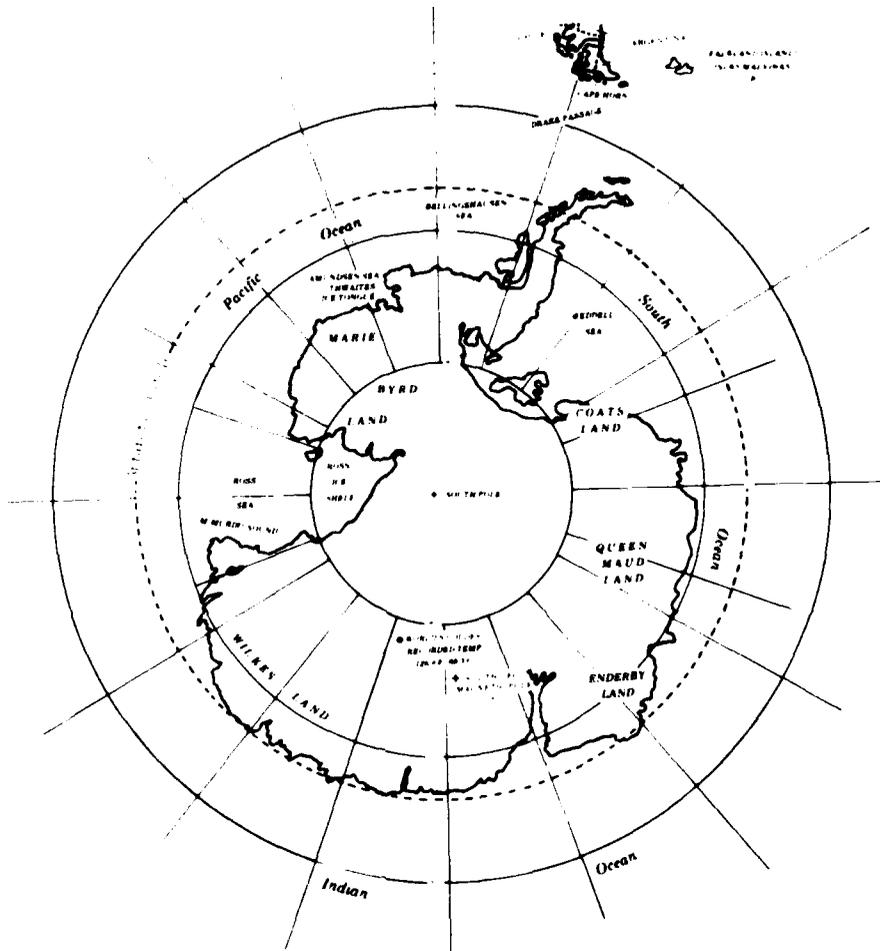
In *Antarctica: Chile's Claim*, Brigadier Luis S. Mericq, Army of Chile, a former National Defense University International Fellow, recounts the relatively short history of Antarctic explorations and discoveries, and describes the diverse physical characteristics of the region. He analyzes the pressures—environmental and political—that threaten the future development of Antarctica. This groundwork leads to a critical examination of the remarkably successful Antarctic Treaty of 1959, an agreement which has promoted the peaceful sharing of scientific research and the resolution of political issues. The author concludes by making a case for the Antarctic claims of Chile, which, by reasons of geography and history, has a long and abiding interest in the continent.

The Antarctic Treaty is due for review and possible revision in 1991. The United States and other signatory nations preparing for this event need to know more about this still largely unexplored land, and to understand better one another's perspectives on Antarctic issues. This study is a step toward responding to those needs.



Bradley C. Hosmer
Lieutenant General, US Air Force
President, National Defense
University





Based on map in the 1977 Edition of World Book Encyclopedia

Geographic features of Antarctica

1. The Antarctic Continent

THE ANTARCTIC CONTINENT TODAY is an object of concern. And in the coming decade, it will occupy a special place in the attention of Chile and many other countries and international organizations, both for the resources it possesses and for the distribution of its vast territory. Antarctica, or the Frozen Continent, as it also is known, amounts to approximately 14,500,000 square kilometers (km²), or 5,598,450 square miles. In area, it is about the size of the United States and Europe combined.

The name "Arctic" comes from *Arktos*, a Greek translation of the Latin word *Ursa*, the bear constellation that used to guide navigators of old toward the North Pole. The word "Antarctica" means *Anti-Arktos*, because the constellation *Arktos* cannot be seen when traveling in the direction of the South Pole. The Greek letter "K" has been maintained, or is transformed into the letter "C" in most languages. "Antarctica" is the word that designates the southernmost continent.

Antarctica is the last portion of the globe that is still little known and explored. According to

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geologists, the Antarctic Continent originated in the Mesozoic Age (between 70 million and 230 million years ago), separating from Africa, Australia, India, and South America because of geologic movement during this period. (See figure 1.) During this age, Antarctica was not yet situated in its present latitude; it had tropical flora and abundant fauna, which slowly died as the region separated from the other continents and came to occupy its present location.

Unlike the Arctic, which is composed of a huge frozen mass of ocean, the Antarctic Continent is made up of an immense land mass mostly covered by ice, protecting the mystery of its enormous number of resources, especially minerals.

Major Explorations and Discoveries

Sixteenth Century

In 1520, Ferdinand Magellan discovered the strait that carries his name. Since that date, geographers have called the lands south of the Strait "Magellan Land." In 1568, the Spaniard Alvaro Mendana de Neira ventured into the region.

In 1578, Francis Drake discovered Cape Horn. In 1599, merchants from the Low Countries (the Netherlands, Belgium, and Luxembourg) declared

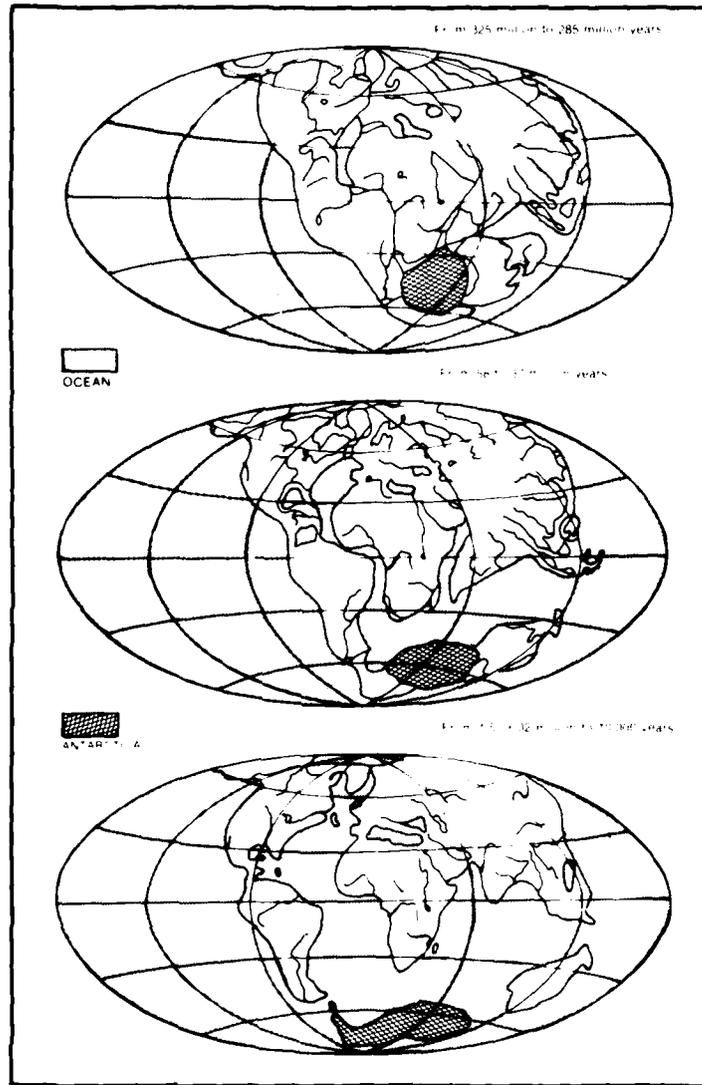


Figure 1. Origin of the Antarctic Continent

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that they had reached the South Shetland Islands. This report was not confirmed, so that even today some geographers say that they had not reached Cape Horn, but some smaller islands nearby.

Finally, in 1599, the Dutchman Dirk Gherritsz sailed to Antarctica.

Seventeenth and Eighteenth Centuries

During the seventeenth and eighteenth centuries, Dutch explorers—such as Willem Jansz (1606), Dirk Hartog (1616), Abel Tasman (1642), and Jacob Roggeveen (1771)—Portuguese explorers Pedro Fernandes de Quieros (1600) and Antonio Rocha (1675), the Frenchman Jean Baptiste Bouvet (1738), and the Englishman Sir James Cook, among others, adventured to this part of the world.

Even though none of them reached the continental land mass, they did reach the so-called sub-Antarctic islands. They observed the immense frozen surfaces of icebergs, which are floating islands of ice with only one-tenth of their total mass above water.

The first truly scientific trip to the Antarctic Continent was made between 1772 and 1775 by Sir James Cook of Britain in his ship *Resolution*. Cook sailed around the continent for the first time, proving the continuity of the seas surrounding Antarctica.

Nineteenth Century

From the end of the eighteenth century through the early nineteenth century, Antarctic voyages were interrupted by the political situation in Europe (the French Revolution and the Napoleonic Wars). The voyages were resumed after 1819 by Fabian Gottlieb von Bellingshausen, who was serving Czar Alexander I of Russia. Bellingshausen was the first to discover land south of the Antarctic Circle, in 1821, and named an island for Peter I, in homage to the organizer of the Imperial Russian Navy.

Accompanying Bellingshausen were William Smith (British) and James P. Shetland (American), who really arrived at the Shetland islands to the south.

In 1820, Edward Bransfield (British) navigated the strait which bears his name. The following year, Nathaniel B. Palmer (an American famous for hunting sea lions) and George Powell (British) discovered the South Orkney Islands.

In 1823, James Weddell (British) entered the continent by sea east of the Land of O'Higgins; this sea is known today as the Weddell Sea.

During 1838, Dumont D'Urville (French) discovered vast territories north of O'Higgins Land, naming them Louis Philippe Land or the Adélie coast. In the next year, 1839, Charles Wilkes (American) discovered the zone known today as Wilkes Land, between 94° and 160° west longitude.

In 1841, James Clark Ross (British) discovered the open sea that bears his name. He and D'Urville made observations destined to determine the magnetic South Pole. Ross concluded that the correct position was $75^{\circ} 00' S$ and $136^{\circ} 45' E$. For his part, D'Urville felt that the correct position was $72^{\circ} 00' S$ and $136^{\circ} 45' E$. The most recent calculation, made in 1962 by A. Hanley and A.L. Burrows,* is $67^{\circ} 30' S$ and $140^{\circ} 00' E$. The National Geographic Society states that in 1962 the South Magnetic Pole was $66^{\circ} 57' S$, $142^{\circ} 35' E$.

The latitude of $78^{\circ} 10' S$ reached by Ross lasted almost 60 years as the extreme southern limit of the continent's penetration.

Near the end of the century, two important expeditions were undertaken. One, in 1897-99, was sent by Belgium under the command of Adrien de Gerlache in the ship *Belgica* to perform scientific observations. The other, an English expedition in 1898, was commanded by the Norwegian C.E. Borchgrevink in the ship *Southern Cross*; this expedition was the first to organize an encampment on the most distant part of the world, Ridley Beach on Cape Adare.

*A.L. Burrows, "Location of the South Magnetic Pole." *New Zealand Journal of Geology and Geophysics* (Wellington: Department of Scientific and Industrial Research), June 1963, pp. 454-64. In the course of a 1961-62 summer cruise in the US Navy icebreaker *USS Burton Island*, a landing was made on Australian Antarctic Territory at Cape Denison in Commonwealth Bay, the site of the base of the 1911-14 Australasian Antarctic Expedition. A series of magnetic observations was made, from which the approximate position of the south magnetic pole was determined to be about $67.5^{\circ} S$ latitude and $140^{\circ} E$ longitude.



**Weddell seals sun themselves on the ice on
McMurdo Sound in Antarctica.**

Twentieth Century

During the twentieth century, greater activity is noted in the discovery and exploration of the Antarctic Continent. In 1901, Erich von Drygalski (German) discovered the Wilhelm II Coast; in 1902, Robert F. Scott (British) discovered the Edward VII Peninsula; and in 1908, the Frenchman Jean Charcot discovered Marguerite Bay and the Fallieres Coast.

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In 1911, after a dramatic journey, Roald Amundsen (Norwegian) reached the South Pole. Only 35 days later, Robert F. Scott (British) arrived there.

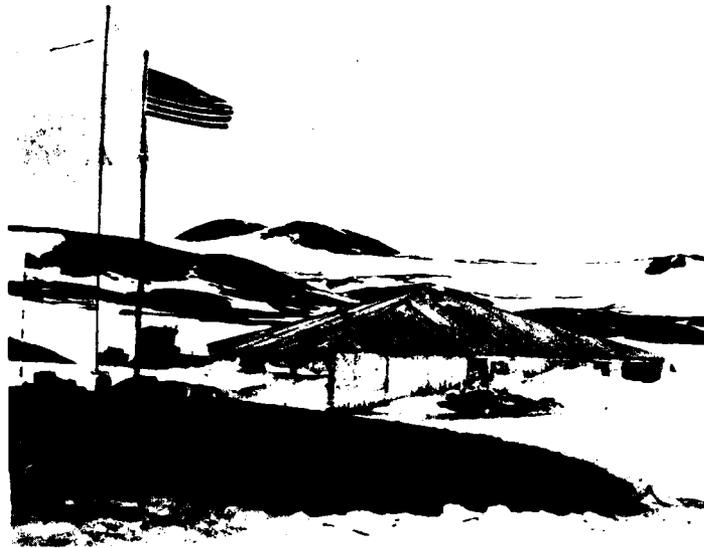
In 1928, the Australian Hubert Wilkins made the first flight over Antarctica. That same year, Richard E. Byrd (American) began a series of explorations. With the help of air navigation, he discovered Marie Byrd Land, the Rockefeller Mountains, and the Edsel Ford Ranges; Byrd and Bernt Balchen were the first to fly over the geographic South Pole.

Between 1933 and 1939, Lincoln Ellsworth (American) conducted several expeditions, climaxed with a transantarctic flight in 1935.

In 1938 and 1939, a German, Alfred Ritscher, captain of the ship *Schwabenland*, prepared a very precise map of a determined area through his Antarctic explorations.

From 1939 through 1941, Richard E. Byrd conducted the most complete and fruitful expedition ever made in Antarctica up to that time.

With scientific and technological methods continually developing during the 1940s and 1950s, countries interested in Antarctica mounted permanent investigations of the continent. This work led to the first Antarctic Conference, conducted in 1955 in Paris by the Special Committee for the



View of Hut Point, Ross Island, Antarctica. Hut Point was the site of the 1902 camp of the famed British explorer Robert F. Scott, during his first Antarctic expedition (1900-04). In 1910, Scott undertook his second expedition to the Frozen Continent, reaching a base in Ross Sea in 1911 in the ship *Terra Nova*. In November of that year, Scott and four companions started southward on foot on their ill-fated trek to the Pole. They reached the South Pole on 18 January 1912, only to find that the Norwegian Roald Amundsen had preceded them by 35 days. Scott and his party died while returning to camp from the Pole. Their journey constitutes one of the epic events of British exploration.

Geophysical Year. This conference focused on coordinating scientific programs that were to be conducted on the Frozen Continent.

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In 1957 and 1958, 39 nations took part in the International Geophysical Year (IGY); among them were Chile, Brazil, and Argentina. Since then, research in Antarctica never has been suspended. This continuous research has led to the discovery of valuable mineral reserves, fresh water, and sea life capable of supplying world food needs for a long time.

Geographical Characteristics

General Description

The Antarctic Continent actually is a group of land masses (islands) located around the South Pole, with a surface area of approximately 14,500,000 km² (5,598,450 square miles). It is formed by islands, frozen lakes, fjords, glaciers, great mountain ranges, and vast plains covered by thick layers of ice. About 1,600 kilometers (992 miles) of coastline never have been reached by ship, and land explorations have covered barely 1 percent of the surface of Antarctica.

A huge ice-free valley was discovered not long ago at an altitude of 3,000 meters (9,843 feet), totally hemmed in by mountains. But such an ice-free area is an exception. The ice cap reaches to the sea and runs virtually the length of the coast, from which icebergs of different sizes and shapes break loose.



A section of an Antarctic iceberg blocks the passage between Beaufort and Ross Islands.

In certain sectors, the mantle of ice stretches into the sea and floats on it, even though permanently joined to the continent. These extensions of land ice are known as ice shelves. The most important ice shelf extends along 800 kilometers (496 miles) of the coast of the Ross Sea, and is approximately 650 kilometers (403 miles) wide. This type of ice shelf produces the typical icebergs of

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Antarctica, measuring on average about 250 meters (820 feet) thick and 160 kilometers (99 miles) long.

Some years ago, when an attempt was made to draw a profile of the land below the ice covering the Queen Maud area, the terrain was discovered to be as uneven as the coast of Norway. Mountains in the Queen Maud area reach altitudes of 1,100 meters (3,608 feet), with peaks barely emerging above the ice cap, together with valleys more than 800 meters (2,624 feet) below sea level. The ice cap was found to be more than 2,500 meters (8,200 feet) thick in places.

In addition to continental ice, Antarctica produces pack ice, a true floating ice belt that surrounds the continent; this ice belt kept the continent isolated until the twentieth century.

According to the theory of continental drift, especially as expounded by the Austrian geologist Eduard Suess, a "super continent" once existed in the tropics of the Southern Hemisphere. This super continent, called *Gondwanaland*, was made up of South America, Africa, Madagascar, Australia, New Zealand, and India. This continent crumbled over time. After the other areas had broken off, what was left drifted south, becoming first temperate, then cooling to create Antarctica. (See figure 1 on page 5.)

Several characteristics indicate that Antarctica was not always isolated. The most notable characteristic is found in the remnants of vast petrified tropical forests on Palmer Peninsula, greatly resembling those still existing in the tip of South America, Australia, and New Zealand. The almost

identical vegetation of these vastly separated regions indicates that some primitive land connections or chain of islands must have existed as a bridge or starting point for great migrations of species of vegetation.

By the middle of the nineteenth century, Charles Darwin, working on his theory of evolution, discovered a great gap in the development of plant life. This gap made him suspect the existence of a remote region where certain plants developed in isolation until they suddenly found a way to reach the rest of the world.

Studies conducted by seismologists* of seven different nations provide the following information:

- About two-thirds of Marie Byrd Land is below sea level and covered by a sheath of ice 600 to 4,000 meters (1,968 to 13,120 feet) thick.
- This sheath of ice extends below sea level for some 485 kilometers (300 miles) inland.
- On the Adélie Coast, the French have verified that the Charcot Base is situated on an ice cap that penetrates nearly 550 meters (1,804 feet) below sea level.

*Geophysicists who specialize in the study of earthquakes, in particular the shock waves they create, and their attendant phenomena. Studies of these seismic waves enable the deeper structures of the earth to be investigated.

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- Research conducted by an American scientist at Victoria Land, located on a plateau 3,000 meters (9,840 feet) high, indicated that the depth of the ice cap there is 4,300 meters (14,104 feet). Close to the polar plateau, Sir Vivian Fuchs, the British explorer, found that the depth of the ice varied between 300 and 3,000 meters (984 to 9,840 feet).

Topography

The principal characteristic of Antarctica is the eternal presence of snow, covering the rough peaks that rise to an elevation of 5,140 meters (16,859 feet) above the sea that surrounds them.

The existing mountains—isolated, in groups, or in extended ranges—are part of the 22,000 kilometers (13,640 miles) of coastline and stand out against the white of the surface. A mountainous complex develops from the northeast coast of the Ross Sea across Victoria Land to the Weddell Sea; these mountains cross the 0° and 180° meridians, and geographically separate the continent into eastern and western Antarctica.

Palmer Peninsula, which extends north to South America across the Drake Passage, constitutes an abrupt and mountainous link longer than the Italian peninsula. Glaciers have formed valleys of ice in some parts of this peninsula; winds have denuded huge coastal areas, leaving the rocky consistency of the Antarctic Continent uncovered.



Mt. Erebus, rising 1,448 feet (3,794 meters) above Ross Island on McMurdo Sound in the Ross Sea, is typical of the Antarctic mountain complex that makes up much of Victoria Land. Mt. Erebus is the only active volcano in Antarctica.

A gigantic ice cap hides mountains that range from 2,700 to 3,000 meters (8,856 to 9,840 feet) high.

Climate, Air, and Wind

The Continent of Antarctica is dominated by a true "polar climate,"* which becomes more accentuated from Marguerite Bay toward the South Pole.

Antarctica performs an important function in the atmospheric circulation of the Southern Hemisphere. The cold, dry air of the Antarctic "polar front"*** is created in the Antarctic Continent, which supplies at the same time the relatively warm air from the upper atmosphere. This warm air descends to form an interior high pressure center through the relatively warm air brought by surface currents.

*The Antarctic polar climate, also known as "arctic climate" or "ice climate," is the climate of the region around the South Pole. In the Koppen classification system—developed by Wladimir Peter Koppen (1846–1920), German biologist, meteorologist, and climatologist—a region's climatic elements are related to its vegetation by numerical values; under Koppen's system, a polar climate is one in which the average monthly temperature is below 10°C (52°F) every month.

**The Antarctic polar front is the semipermanent and semicontinuous boundary located between 30° and 60° latitude that separates air masses of polar and tropic origin. The variable weather conditions of middle latitudes are associated largely with fluctuations in the location and intensity of the polar front. Most of the north-south variation of atmospheric temperatures is concentrated within the frontal zone, which averages about 160 kilometers (100 miles) in width.

Air circulation zones in Antarctica are as follows:

- Three sectors of air flowing outward: Victoria Land, O'Higgins Land, and the western sector of Enderby Land.
- Three sectors of air flowing inward: Marie Byrd Land, the eastern sector of the Weddell Sea, and Queen Maud Land.

A wind of 20 knots with a temperature of -50° C constantly blows at the South Pole.

Antarctica normally experiences the low pressure centers inherent to bad weather; these centers can affect a large part of the South American continent.

Surface winds periodically sweep over ice and rock at 200 to 300 kilometers (124 to 186 miles) per hour.

Temperature

Temperatures follow a circular pattern around the Antarctic Continent, descending from the sea-coasts inland. An isotherm* of 6° C crosses near the latitude of Cape Horn.

*An isotherm is a line on a map or chart of the earth's surface connecting points having the same temperature at a given time, or the same mean temperature for a given period.

The South Pole is not precisely the coldest spot on earth, however. A "cold pole" is located near the Soviet Vostok station at 78° 28' S latitude and 106° 48' E longitude, where temperatures as low as -87° C have been recorded.

Visibility

In spite of the purity of the atmosphere, visibility can be limited, and frequently is reduced to zero, because of drizzle, snow, blizzards, or mist that normally occur close to the surface. Absolutely clear skies seldom last more than 24 hours.

Flora

The 11 million cubic kilometers (14,377,000 cubic yards) of ice that have accumulated on the continent over the centuries have elevated the average altitude of Antarctica some 1,800 meters (5,904 feet). Left are fossils that show that tropical vegetation flourished some 160 million years ago, giving credence to Austrian geologist Edward Suess's theory of Continental Drift.

Climatic conditions on the continent of Antarctic present great difficulties for the development of plant life, principally because of ice covering most of the surface. Certain species, however, manage to

grow during the summer, such as algae, represented by large laminar species (*macrocystis* and *furvillea*). These algae provide refuge and food for innumerable animals, particularly fish, crustaceans, and mollusks. Moss and more than 300 varieties of lichen along with algae represent the majority of Antarctic flora. The soil in which they grow is free from ice and is made up of the remains of previous vegetation.

Fauna

Many animals and birds are found in the Antarctic territory despite the harshness of both the land and sea environments. Also found are sea mammals, such as whales and seals, and krill, fish, squid, crabs, and lobsters.

For centuries, the cold waters of the Northern Hemisphere have provided mankind with the food products of fish. The increase in the human population and the growth in demand for animal protein brought with it an increase in the exploitation of resources existing in tropical and Antarctic waters.

A list of these types of marine resources follows:

- **Crustaceans**, such as crabs and lobsters, and, in lesser quantities, shrimp and crayfish are found only in the southern Antarctic islands. The volume of these resources is not significant. Within the *Pelagic invertebrates*, the *euphausiids* are most important. In

certain areas, other planktonic crustaceans exist, such as amphipods, copepods, chaetochaetes, and polychaetes.

- **Shrimp and octopi** are extremely important in the structure of the Antarctic ecosystem, since they make up a significant portion of the diet of sea lions, seals, penguins, and fish. Without a doubt, shrimp and octopi potentially are an extremely important resource in the world food supply.
- **Fish.** The Soviets have the most intense fishing activities in Antarctic waters. Since 1970, a decline in catch from 400,000 tons that year has been noted. Major fishing areas have not been well detected, but estimates show that they center in the Scotia Sea and in waters neighboring New Zealand. In waters close to the Antarctica Continent, fish do not seem very abundant; but in the Ross Sea, large fish from the species *Dissostichus mawsoni* have been caught. Approximately 75 to 120 species of fish in that area belong to the group *Notothenia*. All the fish live on the small submarine platform of the Continent and Antarctic islands, as well as on the submarine banks of the subantarctic islands.
- **Krill** constitute the base of the Antarctic ecosystem; the krill biomass is estimated at 5 billion tons. Some 100 million tons can be captured annually, according to estimates, without ruining the stock. In the Antarctic summer of 1975-76, for example, the German ship *Walter Heuring*, together with the

German factory ship *Vessel* and the Polish ship *Professor Sciledski*, captured krill at an estimated 50 tons per knot. The planktonic crustaceans and larvae that make up krill are about five centimeters (two inches) long, or seven-and-a-half centimeters (three inches) long if their antennae are included.

Krill (order *Euphausicae*) are comprised of 15 percent protein. Many countries in the world presently lack food rich in protein; krill in various forms could become part of the human diet, much like cheese, butter, and sausage. Krill also could be used as fodder and fertilizer. Principal krill harvesting nations today are Japan, Poland, and the USSR. Countries taking part experimentally in the harvesting of krill are Chile, South Korea, East Germany, West Germany, and Taiwan.

The krill mass is formed by tiny crustaceans similar to shrimp; it is sold in many different forms on the international market, such as whole, boiled, frozen, and raw (Japan); fried (Norway); in *bais* or frozen tips and turnovers (Chile); and chopped up and in paté (USSR). Krill also is used in concentrates and extracts, fish meal, and pigments for giving salmon their reddish color.

- **Sea mammals** such as sea lions and whales have been exploited in the Antarctic since the end of 1819, indiscriminately at the beginning. (Table 1 shows the population of seals in Antarctica, according to the census of the years 1969, 1972, 1973, and 1974, and their locations.)

Table 1
Seal population in Antarctica

Species	Areas	Estimated number
<i>1969</i>		
Crabeater ¹	Weddell Sea	10,597,500
Weddell ²	(For	92,900
Leopard ³	all	205,400
Elephant Seal ⁴	species)	28,400
		<i>Total: 10,924,200</i>
<i>1972</i>		
Crabeater	Amundsen and	1,193,000
Weddell	Bellings-	45,600
Leopard	hausen	48,600
Elephant Seal	seas	37,460
		<i>Total: 1,324,660</i>
<i>1973</i>		
Crabeater	Oates	472,000
Weddell	and	64,800
Leopard	George V	23,200
Elephant Seal	coasts	63,900
		<i>Total: 623,900</i>
<i>1974</i>		
Crabeater	Adélie, Claire,	492,100
Weddell	and Banzare	
	coasts	52,500
Leopard	Banzare	29,600
Elephant Seal	Coast	75,000
		<i>Total: 659,200</i>

¹The ubiquitous crabeater (krilleater) seal (*Lobodon car-ninophagus*) is the most populous of the truly Antarctic seals (which include the Ross, Weddell, and leopard seals; the Ross seal is not included in this table). The crabeater seal (*Cangre-jera* in Spanish) averages two-and-a-half meters (eight feet) in length.

²The gregarious Weddell seal (*Leptonychote weddelli*) is unique because it is able to survive under fast moving ice, even in

Table 1—Continued
Seal population in Antarctica

winter, by keeping breathing holes open with its teeth. The Weddell seal averages three meters (10 feet) in length.

³The solitary and aggressively carnivorous leopard seal (*Hydrurga leptonyx*) is voracious, feeding on penguins and other sea birds and pups of other seals; it is the only seal to feed extensively on warm-blooded prey. The leopard seal (*leopardo* in Spanish) averages four meters (13 feet) in length.

⁴The southern elephant seal (sea elephant) (*Mirounga leonina*) spends the summers on islands north of latitude 65° S. Commercial sealing once seriously endangered its survival, but conservation measures have enabled it to increase its population. The elephant seal (*Elefante Marino* in Spanish) averages six meters (19.5 feet) in length.

The waters around Antarctica are inhabited by six species of great whales. The blue whale (*Sibbaldus musculus*), the largest animal that has ever existed on earth, measures 20–45 meters (66–148 feet) and weighs up to 150 tons. The finback whale (*Balaenoptera physalus*), generally not exceeding 25 meters (82 feet) in length, is one of the most commercially valuable, and hunted in greatest quantity. Also inhabiting Antarctic waters are the humpback whale (*Megoptera novaeangliae*), which is almost extinct; the sperm whale (*Physeter catodon*); the minke whale (*Balaenoptera acutorostrata*); and the killer whale or orca (*Orcinus orca*). The killer whale, which measures up to nine meters (30 feet), has a significant impact on the Antarctic ecosystem because of its predatory habits.

During and after the hunting period, many studies are conducted about this marine species, the

whale, trying to learn its habits. But many questions still remain as to where they go, their spawning zones and life span, and if males and females live together in the same herd.

Between the years 1930 and 1960, annual production of whale products was between 1.5 and 2 million tons.

At present, the International Whaling Commission (IWC) deals with whaling issues. The IWC tries to protect this important creature from indiscriminate hunting through the application of scientific recommendations.

- **Birds.** The study of Antarctic birdlife has a rich history. Nearly 50 species nest on the islands or along the coast and feed directly from the sea, depending largely on krill for nourishment. The giant petrel has a wingspan that reaches two meters (six-and-a-half feet). Other important birds are cormorants, sea gulls, and skuas. Penguins comprise 98 percent of the total Antarctic fauna; among them, the Adélie penguin (*Pygoscelis adeliae*) is the dominant specie. The stately emperor penguin (*Aptenodytes forsteri*) is the tallest, reaching 1.1 meters (almost four feet) in height. Other types of penguins in the Antarctic are the chinstrap (*Pygoscelis antarctica*), the gentoo (*Pygoscelis papua*), and the Marconi (*Eudyptes chrysolphus*). Penguins lay one egg, which can weigh up to 500 grams (a little over a pound).



An Adélie penguin (*Pygoscelis adeliae*) sits on a nest on the edge of McMurdo Sound in the Antarctic. Adélies and the stately emperor are the only penguins that actually live in Antarctica. While the Frozen Continent is the main breeding are for pengiuns, they are by no means confined to the South Polar Region.

An estimated 200,000 penguins live in the Antarctic area. The most important thing that these birds do from an ecological standpoint is take food from one ecosystem and transfer it to another through migration.

Nonrenewable Resources

The Antarctic Continent has awakened high interest in its nonrenewable resources; these resources have caused many countries to modify their foreign policies to permit them to take part actively in the exploration and exploitation of Antarctica. These nonrenewable natural resources include minerals and hydrocarbons.

Minerals

Considering that Antarctica was united with other continents 250 million years ago—continents on which important layers of minerals have been discovered and exploited—one can logically assume that mineralized areas on these continents would correspond with similar areas in the Antarctic. Consequently, the possibility of discovering minerals in Antarctica would be realistic; but the difficulty would lie in locating them, because surface rock represents only 2 percent of the surface of the continent. The remainder consists of permanent ice cover.

Significant minerals discovered in Antarctica include iron, copper, silver, gold, molybdenum, and manganese. While the abundance of these minerals has not yet been determined, iron appears to exist in the greatest quantity, according to information published by Soviet and North American geologists. The Soviets note large iron deposits in eastern Antarctica and large copper deposits elsewhere.

Gold and silver exist only in limited amounts, in pyrite samples; owing to this low estimated concentration, the presence of these precious metals would not be of great importance in terms of future prospecting.

In 1972, traces of natural gas were detected in a core taken from the Weddell Sea by a scientist on a US research ship, giving support to speculative assessments of the presence of oil and gas in that area. Marine and geophysical surveys found sediments three to four kilometers (one to two-and-a-half miles) thick in the Ross and Weddell Seas.

Some authorities have estimated that reserves of 45 billion barrels of oil and 115 trillion cubic feet of natural gas may be in the Antarctic, but these estimates are highly speculative. They are based on worldwide averages, and actual petroleum concentrations are known to vary greatly between different sedimentary basins.

Important work has been done in the ocean depths south of the 60th parallel, where extensive areas covered with manganese ore have been found. (Table 2 shows an estimate of major mineral deposits in Antarctica.)

Finally, an age of serious exploitation of Antarctica's mineral resources lies far in the future, because the necessary technology is not yet sufficiently developed. A business venture of such nature in this environment does not draw enough economic interest to compensate for risks and cost involved in such commercial development.

Table 2
Estimate of major mineral deposits in Antarctica

Type	Product	Characteristics	Exploitable Areas
Hydrocarbons	Oil, gas	Accumulations in shelves 100 to 500 meters (270 to 1,349 feet) under water	Shelf areas of the Ross, Weddell, Bellingshausen, and Amundsen Seas
High-grade gold	Gold, silver	Hydrothermal lodes and small to medium sub-volcanic bodies; fineness above 100 grams (3.5 ounces) per ton	Palmer and Shetland Archipelagos; Danco Coast; and Larsen Channel
Marine sulphurs	Zinc, lead, silver	Medium to large stratiform bodies in sedimentary and volcanic rocks	Herrera Channel to Spring Point, Transantarctica Mountain
Ultra-morphic igneous rocks (volcanic magna)	Chrome, nickel, vanadium, platinum, copper, uranium	Stratified encroached bodies with vertical differentiation	Transantarctic Mountains (Dubek Range)

Hydrocarbons

The resources that have awakened the greed of many countries are hydrocarbons, because of the greater feasibility of their exploitation in the short run. For years, Great Britain, the United States, and the Soviet Union have conducted studies in nearly all Antarctic underwater areas where sedimentary basins exist.

2. The Future of Antarctica

IF DIFFERENT "STAGES OF GROWTH" could be established in the Antarctic Continent, the region could be said to be actually entering its third stage of international evolution. The three stages are outlined as follows:

- The first stage was the heroics of discovery, highlighted by classic expeditions that have been recorded in history.
- The second stage was the vast process of scientific research and cooperation, beginning with the International Geophysical Year (IGY) in 1957–58 that led to the Antarctic Treaty of 1959. Today, this stage is reaching extraordinary development, corresponding to the increase of worldwide scientific and technological knowledge.
- The third stage, or era—the development of living and mineral resources—has been made possible mainly by what the second, or scientific, stage has been delivering in its generous contributions.

But no one really should be surprised that the resources of Antarctica have begun to be watched with interest, not only by consultative parties to the Treaty of 1959 and the Treaty's signatory countries, but also by many other countries that otherwise have remained outside the Antarctic deliberations.

Pressures on the Antarctic System

The enormous resource potential of Antarctica, particularly in oil production, is generating an increasing pressure on the current juridical and political system that has governed the region so far. This pressure surely will increase in the near future.

The Antarctic system currently is under two types of pressure.

- The first derives from the system itself, which has been left deliberately imprecise in the juridical regime applicable to the exploitation of the continent's resources. This view has been due in part to the fact that until now no urgency was felt in defining these matters.
- But the second type of pressure—scientific progress and technological development—has modified this aspect. What was viewed



A mini-version of a United Nations conference took place during the US Navy's "Operation Deepfreeze" activities in the Antarctic in December 1955. Naval officers of three claimant countries sailed in the US Navy's icebreaker, *USS Glacier*, to the Antarctic. With US Navy Commander E.N. Maher (second from right), captain of *Glacier*, are, from left, Lieutenant Commander Foster of the British Royal Navy, Lieutenant Commander Poblete of the Chilean Navy, and Lieutenant Commander Kolbe of the Argentine Navy. Scientific progress and technological developments have put new international pressures on the already-fragile Antarctic eco-system.

in the past as potential for future exploitation is today a reality subject only to decisions required in each case.

The duality of positions observed between countries that claim sovereignty and those that make no

claims has been a characteristic of the history and development of the Antarctic system. And this characteristic has been influential in ensuring that no applicable regime has yet been satisfactorily defined.

The 1980 Convention on the Conservation of Living Resources of Antarctica was the first systematic step in that direction, following some partial measures applicable to the fauna and flora, the hunting of seals, and some aspects of whaling. In spite of this progress, no system has been developed to provide sufficient juridical assurances to those interested in conducting exploration and exploitation activities in the Frozen Continent, except for the steps that the Convention of 1980 brought about. Many doubts of an ecological nature about protection of the environment, and economic feasibility, still abound, but no real impediment exists to defining a clear-cut system. As long as the juridical system is not geared to provide assurances to interested parties who wish to explore and exploit areas of the continent, pressure from the scientific sector will continue to grow.

Other sources of pressures are of equal importance. Numerous other countries are beginning to follow with growing interest the possible future exploitation of resources in Antarctica, in the industrialized world as well as the Soviet bloc and the Third World. Some of these countries would like to take part in such exploitation, and others aim only to benefit from this exploitation, even though not directly intervening.

A trend to press for a revision of the current Antarctic regime can be observed, either to accommodate a larger participation or simply to propose its total replacement. This trend may become relevant over time, especially when the Consultative Parties to the Treaty of 1959 explore alternatives confronting the future of Antarctic cooperation.

The Consultative Parties certainly have not remained aloof to these concerns, and gradually have been taking steps with intent to complement the regime (form of government) outlined in the Treaty of 1959. The most complete and timely of these steps was the approval of the Convention on the Conservation of Living Resources of Antarctica. This Convention not only touches areas in which activities have begun to intensify (such as fishing), but also has the flexibility to accommodate the interests of countries that are not Consultative Parties. This move marked the beginning of a trend that ought to be considered auspicious, provided that these other interests are endowed with proper and legitimate justification. For instance, the incorporation of Poland as a Consultative Party, the first nation accepted after the signing of the treaty, can be viewed as a part of this trend.

The steps already taken are important, but they are still limited and perhaps insufficient. A number of problems relating to Antarctica derive, for instance, from the new Law of the Sea, approved by the United Nations on 30 April 1982, with 130 votes in favor, 4 against, and 17 abstentions.

Problems outlined as follows are bound to give rise to detailed studies and not less detailed polemics:

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- The juridical system applicable to the territorial sea, an exclusive economic zone, the continental shelf, and ocean bottoms outside national jurisdictions located south of the 60th parallel.
- The relation between claimants of territories and the dismissal of cases in sectors not claimed.
- A regimen pertaining to the control of icebergs.

These matters all require urgent attention by the Antarctic powers, since they are problems that become more critical day by day.

Mineral Exploitations Must Consider Ecological Balances

Another area in which progress is needed quickly is related to mineral resources. In spite of deliberations in this area, progress has been slow, perhaps too slow for evermore pressing needs of the world. This author believes that efforts to explore for and exploit riches of any kind in Antarctica must take into account the ecological balance and the whole environment of the Frozen Continent. This caution is due to repercussions that such

operations may have on the climate of the world in general, and on the Southern Cone* in particular.

Any structure created for the exploitation of Antarctic mineral resources should try to reconcile international interests with the pursuit of profits. This view is just, because not all countries enjoy the technology essential for such prospecting and exploitation. Further questions are raised by the necessary exploitation of resources by those countries having the required technology. Such questions will have to be clarified in the document governing the Antarctic system. How are the interests to be reconciled between a country that has technical and financial resources, and a country that has exercised sovereignty for more than 50 years in that continent, but does not have appropriate technology?

Around the Arctic—currently in Alaska and Greenland—the USSR and Norway are seeking oil; Canada, through companies such as Exxon, Mobil, Shell, and Canada Dome Petroleum, is successfully prospecting for oil. This titanic enterprise, in view of exorbitant financial costs and harsh living conditions, has required the development of new technology. This new technology has permitted year-round drilling at great depths. Although the Arctic region is a frozen mass of ice and snow, in contrast with the Antarctic Continent's geological mix of rocky

*"Southern Cone" is an informal term that refers loosely to the southern half of South America, grouping Chile, Argentina, Uruguay, and Brazil, and possibly Paraguay and Bolivia as well.

layers, technological advances surely will help to decrease costs, permit exploitation of additional hydrocarbons wherever they exist, and generate profits. This exploitation, not possible at present, is the main reason why developmental pressures in Antarctica are not yet even greater.

We may conclude that the sooner a resolution concerning Antarctic development is adopted, the lesser will be the difficulties and pressures that are bound to emerge in the future.

Assuming that complementary agreements are reached about the living mineral resources of Antarctica, a revised Treaty is possible by 1989 if the parties deem it advisable. The Antarctic Treaty at that time might be characterized by the existence of a large number of normative documents, a diversity of institutions in charge of applying them, and quite possibly a greater diversity of contracting parties.

However, growing international pressures give rise to the possibility that the Treaty might not be revised after 30 years of successful functioning. This possibility has numerous followers, and will have to be addressed with decisiveness and courage in a setting that will be full of difficult, lengthy, and exhausting discussions. Such discussions may permit the structure of a new treaty, to consider situations that have developed during the 30 years of prior effectiveness, and enable it to deal reasonably with the future.



Adélie penguins play on the ice of Ross Island in Antarctica.

Organization Needed

Another interesting aspect growing from this analysis is that the Antarctic system has lacked certain organizations that are essential for its implementation. An International General Secretariat, for instance, might allow a kind of Antarctic institutionalization. Consultative Meetings, tasks inherent to the Scientific Committee on Antarctic Research (SCAR), and the Convention for the Conservation of Living Resources itself have been insufficient to achieve a stronger treaty. The convention had to set up its own permanent offices within its

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confined area of activity; a need for an office of General International Secretariat was indicated.

The future of Antarctica may be visualized by analyzing three major hypotheses that could provide a basis for an adequate juridical and political system for the Frozen Continent. These hypotheses are discussed below.

1. The model of national sovereignty

Although a model of national sovereignty is of considerable value—considering historic titles, international law, and a continued presence in Antarctica—such a model cannot be considered without also taking into account the long years of Antarctic cooperation with the Consultative Parties, under the Treaty of 1959 and its special regimes. This view means that a future conception of an Antarctic system cannot be based exclusively on “sovereignty” without the need and tradition of international cooperation on the continent. Tomorrow, harmony of the preservation of national sovereignties with patterns of international cooperation will be necessary including interests of Consultative Parties that neither recognize nor claim sovereignty. The Antarctic system traditionally has had such a spirit—and ought to maintain it.

To conduct a division of Antarctica under the pretensions of those countries claiming rights over its territories would be highly improbable, and would have neither the backing of important Consultative Parties nor of some of the claimant nations. On the other hand, such a division would



Thick bay ice on McMurdo Sound in the Antarctic gets a channel broken through it by two icebreakers. When the icebreaker charges into ice at full speed, its sharply inclined bow, meeting the edge of the ice, rises on it, and the weight of the vessel causes the ice to collapse.

entail the renewal of international debate over Antarctica; this debate could lead to a regression, to say the least, in negotiations of any kind being conducted relative to the Antarctic Continent. For this reason, the possibility of establishing an "Antarctic Condominium," an option which has been proposed and which classic international law would allow, also should be discarded.

In addition to the claims of Antarctic sovereignty formulated with solid historical arguments so far, other claims could not be admitted under terms of the Treaty of 1959 because of the scant

possibility of reaching agreement. This evaluation also covers the non-claimed sector of Antarctica. Some South American nations, which are not Consultative Parties, have looked with interest at this non-claimed sector. But further claims of national sovereignty do not seem consistent with the reality of the Antarctic situation.

For such nations as Chile, Argentina, and the United Kingdom, which mutually recognize their overlapping Antarctic claims, further delineation of their claimed sectors would not be necessary. This approach also could be valid for existing sovereignties that can be harmonized in the framework of Antarctic cooperation, which is becoming a trend.

2. The model of international cooperation

A model of international cooperation would attempt to develop regimes that would be complementary to the Treaty of 1959. The interests of claimants and non-claimants could be harmonized through these regimes, and the special responsibility of the Consultative Parties over Antarctica could be maintained. Other interested parties eventually could become associated by demonstrating and justifying a special interest and Antarctic experience.

This model has been adopted and propounded by the Consultative Parties, as outlined in the Convention on the Conservation of Living Resources

and in efforts to reach a consensus on a structure for development of mineral resources.

International cooperation, particularly in scientific areas, has been able to balance remarkably the assumptions of national sovereignty and necessities imposed by coexistence on a continent characterized by difficult topographic and climatic conditions. This equilibrium has been the basis for the success of Antarctic cooperation; it should be maintained in the future, when the international community must be allowed to grow, and when this community will be politically more complex.

3. The alternative of internationalization

In 1956, India, followed by Ceylon and shortly thereafter by several other governments, expressed an opinion in the United Nations in favor of internationalizing Antarctica. In March 1983, the internationalization theme was debated at the "Conference of Nonaligned Countries" in New Delhi, where delegates agreed to bring this controversial topic before the next UN General Assembly meeting.

The internationalization alternative attempts to establish an international authority to control exploration and exploitation of Antarctic resources. The same forces that moved in the 1950s and 1960s to seek the internationalization of ocean bottoms outside national jurisdictions seem to be working today to achieve the internationalization of Antarctica. They invoke reasons such as the "common heritage of humanity," attacking without solid

foundations the present system of Antarctic cooperation and arguing that only a few countries will benefit from the development of Antarctica.

This author feels that the future of the Antarctic Continent depends on a decision between internationalization or maintaining the presently proven and effective system of Antarctic cooperation, perfecting it and improving some of its aspects. This important decision is the reason for such urgency in improving the existing regime, transforming it into an integrated and institutionalized system. This move would be the best way to safeguard the interests of the Consultative Parties.

At any rate, in the process of transformation and implementation of the Antarctic system, the Consultative Parties ought to play a more important role, given the fact that they carry an unquestionable preeminence. They should reconcile the aspirations and yearnings of the international community with legitimate rights over the Antarctic Continent.

A Look at Military Values and Importance

Finally, a few words must be written about the purely military value and future importance of Antarctica. The strategic importance of the seas, islands, and the whole Antarctic Continent in a military sense is unquestionable. This importance



An iceberg is spotted in *McMurdo Sound*, Antarctica, by an icebreaker. A constant census of icebergs is maintained, and the location of an iceberg is reported to ships in its vicinity.

was clearly perceived by the United States, England, and Germany during the Second World War. Control of Antarctica allows a tie between the Atlantic and Pacific Oceans and improves the potential logistic support of air and maritime forces.

Some other factors that show beyond any doubt the need to keep the alternate navigation routes located south of Latin America protected and open are listed as follows:

- *The expedition against the Suez Canal by England, France, and Israel in 1956.*

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- The Arab-Israeli conflicts of 1967-73.
- The Greek-Turkish conflict over Cyprus in 1974.
- The vulnerability of the Panama Canal.
- The process of demobilization of Angola and Mozambique, posing a clear danger to the control by the West over the southern tip of Africa, where the ever strengthening Cuban-Soviet influence is evident.
- Grave tensions in the Indian Ocean and in the straits of Southeast Asia.

On the other hand, technological advancements in marine and air transportation allow us to imagine a general area of the Antarctic Continent as the scene in the near future of new routes of transantarctic travel. Travel by these new routes already has been conducted on an experimental basis, showing their feasibility, economy of time, and shorter distances.

* * * * *

This author also would like to comment on news transmitted in the United States on 19 January 1983 by CBS-TV. This news report stated that "the CIA is concerned by what seems to be Argentine preparations to attack the Malvinas again," based on the following facts:

1. Accelerated military training, particularly in the air force and by commandos.

2. Urgent replacement of weaponry lost during the Malvinas (Falklands) war, at a cost of more than \$800 million, despite Argentina's deteriorating economic situation.

3. Modernization of the Argentine Air Forces.

4. Establishment in Antarctica of Argentine bases of a purely military nature, to create new "attack routes" against the Malvinas.

This author hopes that the pressures of Antarctic history and of the international community will be too great to allow any country, especially one of the Consultative Parties, to violate the Antarctic Treaty of 1959 and the traditional peaceful use of the Frozen Continent. An explanation for what Argentina is doing in Antarctica, as indicated in Chapter 3, is that the armed forces of such countries as Chile and Argentina traditionally have exercised their sovereignty, maintaining a permanent presence there and requiring periodic resupply and relief for its personnel. In case of a world conflagration, areas of the Antarctic Continent might be occupied to install logistical support bases, or to assist air and sea navigation.

But in no case should such developments be used in a conflict between two countries.

3. The Antarctic Treaty of 1959

THE FIRST ATTEMPT TO ESTABLISH an international statute for Antarctica took place in 1948, when the United States consulted with seven countries (Chile, Argentina, Australia, France, New Zealand, Norway, and the United Kingdom). But the idea of internationalizing the region was opposed by the territorialists. (See pages 56–58 for a further discussion of these terms.)

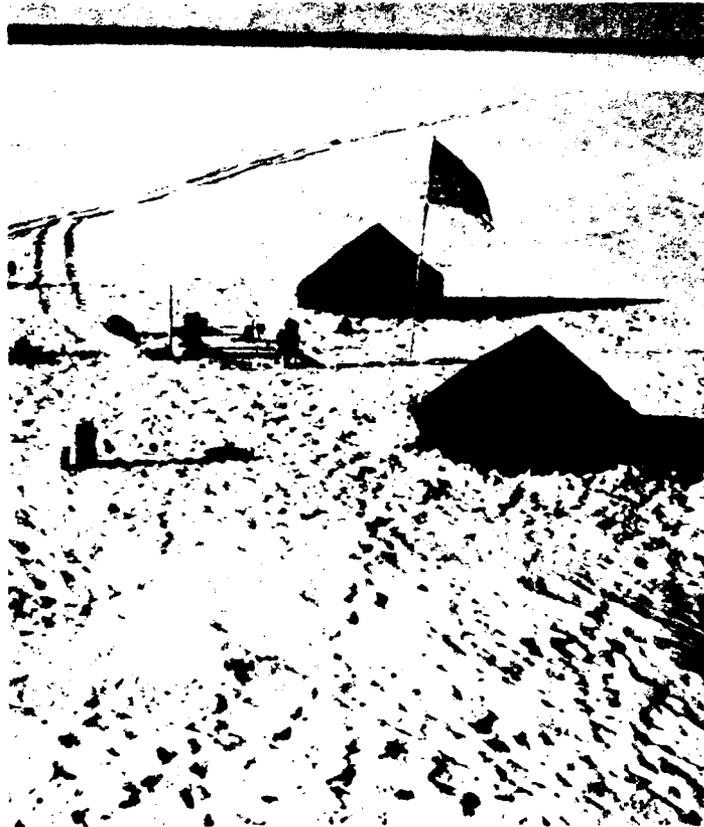
Later, taking into account the two “Polar Years” of 1882 and 1931, the organizing countries agreed to conduct an International Geophysical Year (IGY) during 1957–58. A special committee was created to schedule, in Paris between 6 and 10 July 1957, activities that would be developed in Antarctica. This “Paris Conference” was the first international conference on the Antarctic Continent and dealt with scientific and other issues. Despite efforts by the territorialists to prevent internationalization of the Frozen Continent, the objective of the conference was to define the kinds of scientific activities that would be conducted in that part of the world during the IGY.

At the urging of France, the eight organizing countries were joined by Belgium and the Soviet Union. Five years before, the USSR had joined the International Union of Geodesics and Geophysics and was informed about the conference in its next-to-last session. With the entry of Japan and South Africa, a total of 39 countries became active in Antarctica during the IGY.

As a result of discussions held during the Paris Conference, a resolution was approved by which agreements stemming from the conference would be considered as "temporary initiatives" that would not modify the existing status of the Antarctic Continent.

In truth, the Paris Conference, in addition to its exclusively scientific objectives, opened doors for cooperation and direct contact among the countries having interests in Antarctica.

Before closing the IGY, the United States, in a note dated 2 May 1958, expressed its concern with the future of Antarctica in view of the success of the international scientific exchange, by inviting all countries taking part in the Paris Conference to meet again in Washington to establish a regime for Antarctica, taking advantage of the ambience of understanding that the IGY had provided. The 12 nations that attended the Paris Conference agreed to meet again, and on 1 December 1959 signed the Antarctic Treaty.



Thirty-nine nations took part in research activities in the Antarctic during the International Geophysical Year (IGY) in 1957-58. The IGY base site, seen here from the south, was established just south of Kainan Bay in the Frozen Continent. International interest in Antarctica began with the "Polar Years" of 1882 and 1931. This interest continued after the IGY, with the establishment of a special committee in July 1975 to schedule activities that would be developed in the South Polar Region.

Summary of the Antarctic Treaty

The Treaty was ratified by the signatory countries and became effective 23 June 1961. A summary of its basic provisions is given below. (The complete wording of the treaty is included in the Appendix.)

- Article I** Antarctica shall be used for peaceful purposes only. All military measures, including weapons testing, are prohibited. Military personnel and equipment may be used, however, for scientific purposes.
- Article II** Freedom of scientific investigation and cooperation shall continue.
- Article III** Scientific program plans, personnel, observations, and results shall be freely exchanged.
- Article IV** The treaty does not recognize, dispute, or establish territorial claims. No new claims shall be asserted while the treaty is in force.
- Article V** Nuclear explosions and disposal of radioactive waste are prohibited.

- Article VI** All land and ice shelves below 60° south latitude are included, but high seas are covered under international law.
- Article VII** Treaty-state observers have free access—including aerial observation—to any area and may inspect all stations, installations, and equipment. Advance notice of all activities and of the introduction of military personnel must be given.
- Article VIII** Observers under Article VII and scientific personnel under Article III are under the jurisdiction of their own states.
- Article IX** Treaty states shall meet periodically to exchange information and take measures to further treaty objectives, including the preservation and conservation of living resources. These consultative meetings shall be open to contracting parties that conduct substantial scientific research in the area.
- Article X** Treaty states will discourage activities by any country in Antarctica that are contrary to the treaty.

Article XI Disputes are to be settled peacefully by the parties concerned or, ultimately, by the International Court of Justice.

Article XII After the expiration of 30 years from the date the treaty enters into force, any member state may request a conference to review the operation of the treaty.

Article XIII The treaty is subject to ratification by signatory states and is open for accession by any state that is a member of the United Nations or is invited by all the member states.

Article XIV The United States is the repository of the treaty and is responsible for providing certified copies to signatories and acceding states.

The treaty is, at present, the only juridical document for the Antarctic Continent, and is accepted by all the countries that are party to it. It did not resolve any questions pertaining to entitlements, sovereignty rights, territorial claims, or other reclamations; the treaty only "froze" these matters for 30 years.

The treaty was useful to pacify Western powers in relation to Soviet bases, in that such bases now could only be intended for scientific purposes. The

Soviet Union, however, was able to include in the treaty two clauses which were of interest in that period of the Cold War:

- The prohibition of building bases with military objectives.
- And the prohibition of conducting military maneuvers there.

The treaty also provided that those countries with territorial claims on sectors of the Antarctic Continent (Chile and Argentina, for instance) must undergo certain limitations. These limitations involved conducting only scientific, not political or economic, activities, and not employing military personnel or equipment unless they are used for scientific purposes or some useful peaceful intent.

At any rate, the treaty brought peace and tranquility to that part of the hemisphere. After almost 25 years, it has left a strong mark on the political-judicial life of the Frozen Continent, whose slow evolution along its own road now can be envisioned.

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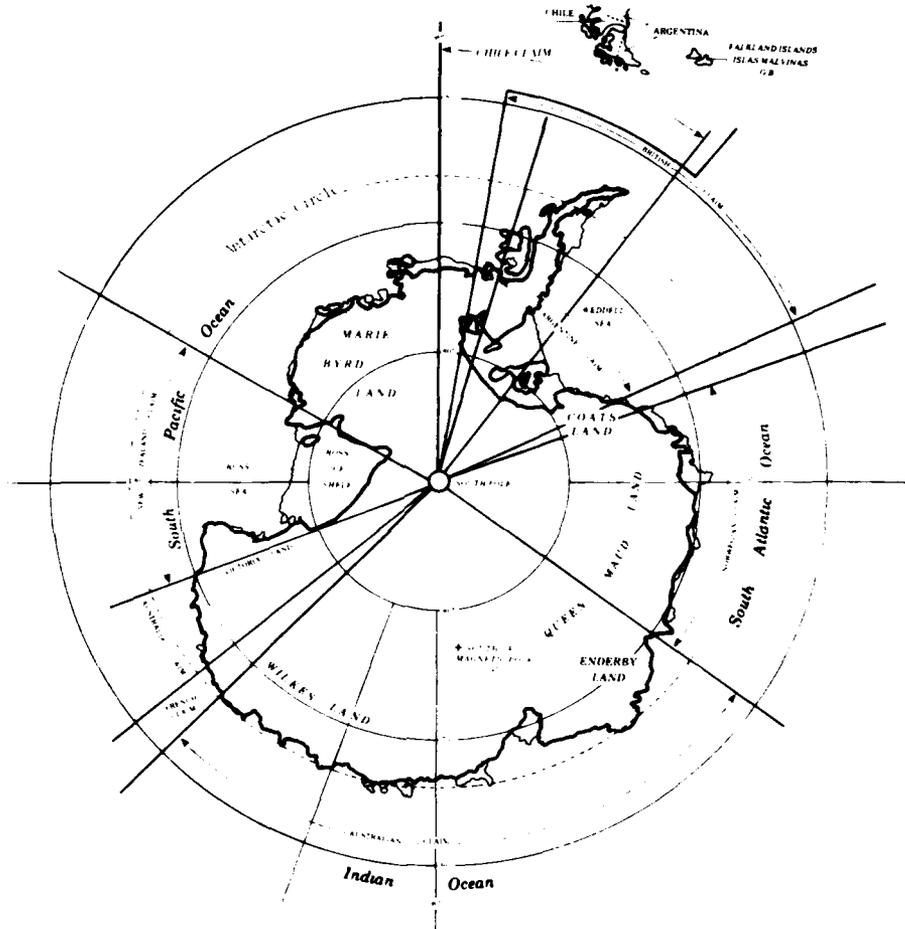
One of the most interesting evolutions in Antarctica is taking place in contemporary law, representing a real and impassioned challenge. The Antarctic is a unique case, without precedent in international law: a continent exclusively dedicated to scientific activities, without military maneuvers or bases, where the absence of native inhabitants facilitates this understanding.

The purpose of the 1959 Antarctic Treaty was fully achieved from a scientific standpoint, since the continuity of international scientific cooperation, begun during the IGY, was maintained through the efforts of the Special (Scientific since 1961) Committee on Antarctic Research (SCAR). SCAR is an institution that represents the participating countries at the highest levels; all signatory parties have permanent delegates and representatives on all scientific committees included in SCAR.

Countries with Antarctic Rights or Claims

From 1908 to 1946, seven countries (Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom) advanced formal claims to sectors of the Antarctic Continent. Three of these claims overlap (Argentina, Chile, and the United Kingdom), as shown in the map on page 57. Other countries—among them the United States, the USSR, Belgium, South Africa, and Japan—abstained from making claims or recognizing that such claims had been made by others, without renouncing their own possible rights in the region.

Politically, two positions have been taken by countries having direct interest in Antarctica: internationalism, and territorialism.



Based on map in the 1977 edition of World Book Encyclopedia

Territorial claims over Antarctica

- Advocates of **territorialism** allege that the continent must be considered *res nullius*, which means that it has no owner, and that it can be appropriated and can be subject to national sovereignty and jurisdictions.
- The **internationalists** consider the southernmost continent as *res communis*, belonging to all, not subject to appropriation and national sovereignty for any purpose, but instead, subject to exploitation for the benefit of all humanity through the establishment of the Antarctic Administration on an international basis.

The territorial position holds to a variant, which would be an Antarctic Condominium.

Several reasons are invoked in support of claims over the southern continent. The major ones are historical (discovery or exploration); territorial proximity (contiguity, continuity, or interface); effective occupation; and even security.

- In the **continuity** thesis, the effective occupation of parts of the territory justifies the sovereignty of the occupying state on lands without ownership.
- Under the thesis of **contiguity**, sovereignty is based on the morphological similarity of neighboring areas.*

*Morphology includes the study of shapes and contours of the surface of the earth and the structure and form of organisms, as opposed to their functions.

- Under the thesis of *continuousness* or confrontation (which originated as an adaptation of the Theory of Sectors developed by the Canadian Pascal Poirier for division of lands in the Arctic region), the territorial division would be made by sectors facing each other. That is, along the meridians going through the extreme points of the territorial limits of the countries that converge on the South Pole.

* * * * *

Of importance to specify here is how the Arctic region was divided into sectors. The First Polar Year took place in 1882–83, when 12 nations studied in detail the natural characteristics presented by the Arctic. In 1907, Canada proposed the division of the islands in that region of the world among the three countries claiming its domain: Russia, Norway, and Canada; this proposal was accepted. In this case, characteristics and locations of the territories in dispute by claimant countries allowed a practical solution to be achieved; but this solution has not taken place in the Antarctic.

Claimant Countries

(1) **Argentina**—an intransigent defender of the territorialist position—considers itself as having rights to sovereignty, not only over the claimed Argentine Sector of Antarctica, but also over the Falklands or Malvinas Islands. (See figure 2.)

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"Antarctica Argentina" is seen as national territory and Argentina justifies its retention on the following foundations: *historically* (succession of the old rights of the Spanish crown); *geographical proximity* (contiguosness); *geological affinity*, based on the geological continuation of the Andes range through the chain of islands until it penetrates the adjacent Antarctic region (continuity); and *effective occupation*.

The area claimed by Argentina covers the sector located between the meridians 25° and 74° west longitude, bordered to the north by the 60th parallel of south latitude. The total territory claimed by Argentina is located within the sector also claimed by the United Kingdom, and it overlaps with the Chilean claim. At present, Argentina has 11 Antarctic bases. (A victory by Argentina in the recent confrontation over the Falklands or Malvinas Islands, which could have included the retaking of that archipelago and the maintenance of positions on the southern islands and the South Georgia Islands, would have made the British presence in Antarctica more difficult.)

(2) **Australia** has firmly refused to renounce the territorial claims it maintains over Antarctica. It inherited these claims from the United Kingdom, when in 1933 the UK placed under Australian authority the area located south of parallel 60° south latitude and bordered by the meridians 160° and 45° east longitude; excluded from that area was the narrow sector covered between the meridians 136° and 142° east longitude, which had been claimed by France.

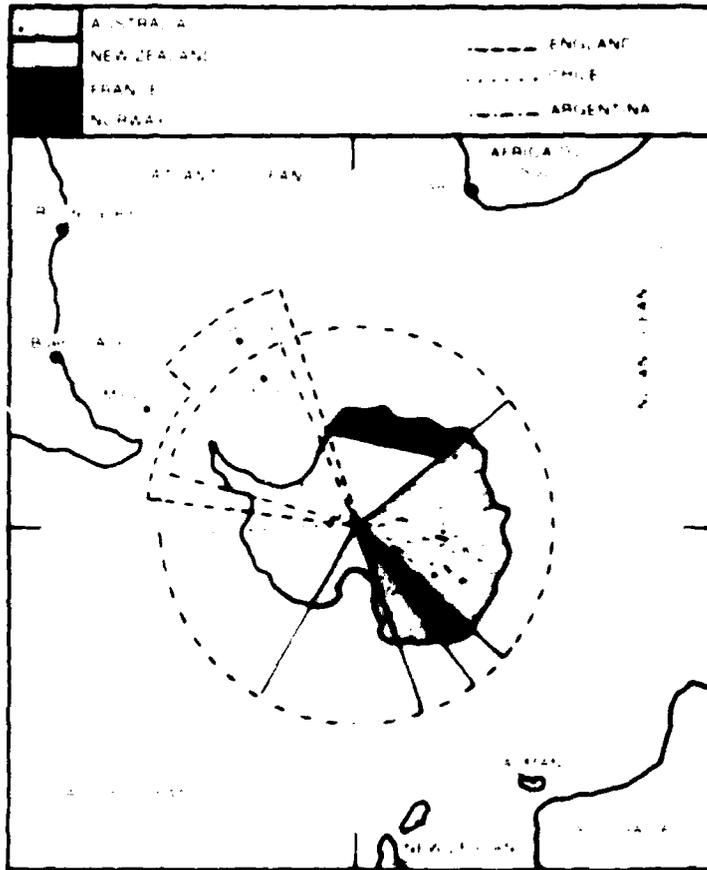


Figure 2. Claimant countries

The Australian claim, also reinforced for national security (Australia is about 3,000 kilometers (1,860 miles) from the Antarctic Continent), covers the greatest geographic extension, encompassing an area of almost 6.5 million km² (about 2.5 million square miles). This claim also is supported by discoveries and explorations made by the British in the first half of the nineteenth century, as well as by Australian expeditions directed by Sir Douglas Mawson in 1911-14. The active Antarctic policy of Australia is based on aspects of national security, prestige, scientific cooperation, and possible economic profits; these policies have the solid support of the Australian Parliament and press. Australia has four Antarctic bases.

(3) **Chile** also defends its territorialist position. This claim is analyzed in detail in Chapter 4.

(4) **France** formally claimed in 1924 Adélie Land, along with the subantarctic Ile St. Paul, Ile Nova Amsterdam, Iles de Kerguelen, and Iles Crozet. Adélie Land was defined as a narrow rectangle between the meridians 136° and 142° east longitude and parallels 66° and 67° south latitude. In 1938, this territory was expanded to include the whole area located south of the 60th parallel between the meridians 136° and 142° east longitude, ending at the South Pole. The French government has firmly opposed any attitude that would attempt to restrict its national sovereignty on the Antarctic region that it claims.

However, France favored the international regulation of scientific activities, and cooperated

closely with Australia and the United Kingdom in Antarctic activities. These countries mutually recognized their respective claims both on Antarctic and sub-Antarctic regions. The French position has been weakened to a large degree because of its loss of colonies in Southeast Asia and Africa. France has four bases on the Frozen Continent.

(5) **New Zealand** began dealing officially with Antarctica in 1923, when the United Kingdom announced a claim to the Antarctic Continent. This claim covered all the islands and territories located between 160° east longitude and 150° west longitude, south of the 60th parallel. This area comprises an immense icy platform of the Ross Sea, called the "Ross Dependency." It was placed under the administration of New Zealand, which later claimed sovereignty over the group of small subantarctic islands located between parallels 49° and 52° south latitude and meridians 166° and 179° east longitude. Even though national security is uppermost in the minds of New Zealanders, especially in view of the fact that their country is relatively close to the Antarctic Continent, no opposition was expressed by its government or shown in public opinion to the idea of internationalizing Antarctica. New Zealand maintains three bases there.

(6) **Norway**, since the last century, has held a leading place in the exploration of the Antarctic Continent. A Norwegian reached the South Pole first (Roald Amundsen, in December 1911). The Norwegian interest over Antarctic territories began in 1939-41, when it claimed the Bouvet and Peter I Islands. On 14 January 1949, the government of Norway officially proclaimed Norwegian

sovereignty over "such parts of the coast" that lie between the meridians 20° west longitude and 45° east longitude. This territory, which is located exactly over the British and Australian claims, does not extend to the South Pole as the other claims do. (Norway did not wish to invoke the policy of sectors, thus avoiding recognition of such policy, in view of the fact that it could jeopardize some of its own interests in the Arctic.) The Norwegian position vis-a-vis claims of some other countries over Antarctica has been characterized as conciliatory and understanding. A station which Norway maintained in Antarctica was transferred to South Africa in January 1960.

(7) **The United Kingdom** maintains its presence in Antarctica, and has contributed the most to the discovery, exploration, and development of the region since the trip by Cook in 1772-75. During the Second World War, partly because of the presence of German ships in southern regions, and partly to reply to Argentinian and Chilean claims over Graham Land, the UK began the "effective occupation" of that area, setting up several stations there in 1943. The first claim over Antarctic territories dates back to 1908, when the British created "Falkland Islands Dependencies." This claim, based on discoveries and explorations by the UK, officially was delineated in 1970, to encompass the islands and territories included between the meridians 20° and 50° west longitude, south of parallel 50° south latitude and between the meridians 50° and 80° west longitude, south of parallel 58° south latitude. In 1962, the area claimed by the UK on the Antarctic Continent itself was separated from the

Falkland Islands Dependencies and was called the "British Antarctic Territory."

The international policy of the UK in relation to Antarctica has been conditioned for a long time by litigation between Argentina and Chile, both of which also claim Graham Land and the islands adjacent to its coastline. British efforts to solve this conflict with the two South American countries always have been within the juridical bounds of the problem (that is, from the standpoint of international law). In the UK, Antarctica always has sparked public interest since the tragic death of Robert Scott in 1912 during his effort to be the first to reach the South Pole. The fact that the British take pride in their historic past concerning Antarctica explains why the protection of British interests in that part of the world has been so important. In addition to economic and scientific aspects, the strategic positions of Graham Land and the Drake Passage represent another factor of capital importance to justify British interest in the region. The UK maintains 17 Antarctic bases.

Non-Claimant Countries

(1) **South Africa** alleges interests in Antarctica by virtue of geographical proximity and scientific activities. In 1948, it made claims of sovereignty on the subantarctic islands of Marion and Prince Edward, located at 47° south latitude and 38° east longitude, halfway between South Africa and Antarctica. Since 1960, South Africa has

occupied one station on the continent on a permanent basis—yielded by Norway—in Queen Maud Land, east of the Weddell Sea.

(2) **Belgium** acquired a permanent place among the Antarctic countries with the expedition of Adrien de Gerlache (1897–99), the first human to spend a winter in Antarctica. Although it never formulated territorial claims, Belgium always has manifested its interest in Antarctica and hopes to be included in all international negotiations related to the continent.

(3) **Japan's** interest in Antarctica was initiated in practice with the expedition of Choku Shirase in 1911. In 1940, when Chile formulated its Antarctic claim, the Japanese government sent a diplomatic communiqué asserting that it considered itself "one of the countries which has titles, interests, and rights" over Antarctica. After the Second World War, and as a result of the peace treaty signed in 1951 with the allied powers, Japan formally renounced "any claims to rights, titles, or interests to any portion of the Antarctic region." In 1954 and 1955, when the preparatory international deliberations took place for the IGY, the Japanese established a scientific station, "Showa," in Antarctica.

(4) **The United States** maintains a position of not recognizing the claims of other countries over Antarctica and reserves judgment concerning rights that may be due in this territory. The United States also fruitlessly has propounded the idea of internationalization. On 13 May 1924, Secretary of State Charles Evans Hughes declared that the "discovery

of lands unknown to civilization, even when coupled with a formal taking of possession, does not support a valid claim of sovereignty, unless the discovery is followed by actual settlement of the discovered country."

The United States encourages the internationalization of Antarctica. However, the United States also supported the United Nations Moon Treaty, which pertains to lunar resources as the "common heritage of mankind." But later the Carter administration "backed away, perhaps fearing that ratification would mean increased authority for the Third World in planning space exploration," according to *Science Digest* of June 1982, page 12. The United States presently has eight bases in Antarctica, one of them (Hallett) jointly manned with New Zealand.

(5) **The Soviet Union** sent an official communication on 27 January 1939 to Norway protesting Norway's declaration of sovereignty over Queen Maud Land and expressing that the USSR "reserves its opinion in regard to the national regime of territories discovered by Russian citizens," alluding to explorations of Captain Fabian Gottlieb von Bellingshausen in 1819-21. This position openly contradicts the Soviet Decree of 15 April 1926, in which the USSR claimed possessions in the Arctic, regardless of who had discovered them.

On 10 June 1950, the Soviet Union addressed a memorandum to the seven claimant states, informing them that any decision over Antarctic territories required the participation and conformity of the USSR. This declaration represents the basis for Soviet policy in the area. The USSR maintains 11 Antarctic bases.

(6) **Poland**, on 2 April 1959, asked without success to take part in preparatory meetings leading to the Antarctic Treaty. It based its interest on efforts conducted during the summer of 1958–59, when citizens of Poland occupied the Soviet Base “Oasis,” which officially was passed on to Poland on 23 January 1959. Later on, because of economic problems, the Poles suspended their Antarctic research program. In February 1977, they established an Antarctic polar station and informed Great Britain, the host country, of Poland’s desire to take part in the Ninth Meeting of Consultation.

(7) **Germany** began its Antarctic interest in the nineteenth century with the expedition of Dallman (1873–74). During this century, Germany conducted the expeditions of Erich von Drygalski (1901–03), Wilhelm Filchner (1911–12), and in 1938–39 with Alfred Ritscher in the ship *Schwabenland*, which carried two airplanes. The Ritscher expedition conducted extensive exploration and did significant mapping work, with aerial photography of a territory of more than 350,000 km² (135,135 square miles) (from 17° east longitude to 5° west longitude) covering the Princess Martha and Princess Astrid Coasts. Notwithstanding these efforts and explorations, the German government did not publicly make any claim over Antarctic territories. During the Second World War, the German corsair ships *Pinguin* and *Komet* used the French subantarctic Iles de Kerguelen as bases for resupply. German ships based there destroyed some 193,000 tons of allied ships, among them the Australian ship *Sydney*.

German war actions proved the strategic value of the Antarctic region and led to a British reaction.

The UK intensified its presence in Antarctica with the installation of weather stations on the west coast of the Graham Peninsula.

After the Second World War, despite interest stated by public and private organizations, the German government refused to support any activity in the region, including the IGY. In 1967, Germany reinstated biological and geophysical research, but only during the southern summers. In February 1979, Germany adhered to the Antarctic Treaty; in the summer of 1980–81, Germany installed its first permanent station (Georg von Neumeyer) on the Princess Martha Coast. This station made possible continuous scientific observations for a year. This research was deemed to be of great scientific value at the Ninth Meeting of Consultation (Buenos Aires) in March 1981 and allowed the Federal Republic of Germany to become a consultative member.

(8) **India** adhered to the Antarctic Treaty and became a consultative member in September 1983. In the summer of 1981–82, India leased the Norwegian ship *Polarsirkel* and conducted a scientific expedition along the coast of Queen Maud Land. In 1956, India proposed the internationalization of Antarctica under the jurisdiction of the United Nations; Sweden supported India in this petition. More recently, Prime Minister Indira Gandhi asserted that in relation with Antarctica, her country is neither expansionist nor aggressive. "We do not wish to press our rights," she stated, "but these rights must be safeguarded."

(9) **Brazil** took part in the IGY but not in the Antarctic region. Hence, Brazil was not invited to participate in the conference in Washington that culminated in the preparation of the Antarctic Treaty. This exclusion led to a formal protest by the Brazilian government, which, in a note of July 1960 to the United States, expressed the feeling that "Brazil, in view of the necessity of protecting its national security, reserves itself the right of free access to Antarctica, as well as of presenting those claims that may be deemed necessary."

In May 1975, Brazil recognized the Antarctic Treaty after becoming aware of the importance of the Frozen Continent. On 28 October 1976, the "Carioca" government approved the General Directives for National Policy on Antarctic Affairs (POL-ANTAR), which define the interest of Brazil in that part of the world. Then, on 20 December 1982, Brazil's first scientific expedition sailed for Antarctica in the *Barao de Teffe*, purchased from Denmark for \$3 million. The main mission of this expedition was to locate a suitable place to set up a permanent scientific base. On 5 January 1983, the expedition reached Antarctica at King George Island in the South Shetland Archipelago. A second Brazilian ship, the *Professor W. Besnard*, reached the same area 7 January 1983 with scientists on board to study climatic conditions, minerals, and Antarctic marine species. Like India, Brazil also became a consultative member of the Antarctic Treaty in September 1983.



Much scientific information was gathered by members of the South Pole Expedition of Admiral Richard E. Byrd during 1928-30. Typical of the work required in the Frozen Continent is this construction in the snow at the expedition's base at Little America. Admiral Byrd and Bernt Balchen made the first flight over the South Pole in late 1929; the Byrd party also discovered the Rockefeller Range and Marie Byrd Land in the Antarctic. Balchen, a famed Norwegian-American aviator, was chief pilot for Byrd's 1928-30 expedition.

Other Countries with Interests in Antarctica

Other countries that also have adhered to the Antarctic Treaty, but are not consultative members, are listed below.

(1) **Denmark** recognized the Antarctic Treaty on 29 May 1965, **Holland** on 30 March 1967, **Romania** on 15 September 1971, **East Germany** on 19 November 1974, and **Bulgaria** on 11 September 1978.

(2) **Peru** also recognized the Treaty recently and seems to be preparing a forthcoming expedition to Antarctica.

(3) **Italy, Spain, and Uruguay** have stated their interests in this territory and appointed commissions to study possible claims or to conduct scientific activities.

(4) **Czechoslovakia, the People's Republic of China, and New Guinea** also have expressed interest in the Antarctic region.

(5) **Sweden** is the only country that after having conducted an Antarctic expedition has not become interested in the area and has not recognized the Treaty. The Swedes effectively mounted an Antarctic expedition in 1901-03 with Otto Nordenskjold in the ship *Antarctic*; this expedition could have provided a basis for a Swedish claim. In 1950-52, Sweden took part in an important joint expedition with Norway and the United Kingdom. But the Swedes never showed interest in either the political or territorial problems of Antarctica, or in taking part in scientific research programs that were being conducted on that continent.

* * * * *

As a curious but no less disquieting fact, the community of Antarctic countries was surprised by

a cable news item that stated that on 7 November 1982 Cuba raised its flag with a signature of Fidel Castro in the Soviet base of *Molodezhnaya*, in a sector claimed by Australia. The Cubans came to Antarctica as members of the 25th Soviet Expedition.

Consultative Meetings Concerning the Antarctic Treaty

Article IX of the Antarctic Treaty refers to the Meetings of Consultation, which are held every two years. The purpose of these meetings is to exchange information on matters of common interest, and recommend to participating governments measures intended to promote objectives of the Treaty. These objectives include the adoption of measures relative to the uses of the continent for exclusively peaceful purposes, scientific research, international cooperation, facilities for the exercise of rights to inspection provided for, and particularly to protect and preserve living resources (fauna) of Antarctica.

Protection of the environment and preservation of resources are major preoccupations in the Antarctic region. These aims are so important that in the First Meeting of Consultation (Canberra 1961), and climaxing at the Third Meeting (Brussels 1964), the "Measures Agreed to for the Protection of Flora and Fauna" were adopted.

- The first and most fundamental of these measures is the declaration that the area of

application of the Treaty (the region located south of 60° south latitude) was called a "Special Area of Conservation," where protection of all native species (mammals, fish, and birds) is assured.

- The most important corollary of these measures of conservation and preservation of ecology has been the study and adoption of measures concerning the "Impact of Man on the Antarctic Environment," which took place at the Sixth Meeting of Consultation (Tokyo, 1970).

A "Code of Conduct for the Bases" and activities conducted in Antarctica in general was adopted during the Eighth Meeting (Oslo 1975).

The theme of the "Impact of Man on the Antarctic Environment," at the Eighth and Ninth (London, 1977) Meetings of Consultation, was connected with the exploitation of living and mineral resources.

In February 1972, 12 Antarctic Treaty countries took part in a conference dealing with the conservation of seals. At the end of this conference, the 12 countries signed a negotiated convention, which became effective on 11 March 1978, when Belgium deposited the instruments of ratification. This convention is designed to safeguard all species of seals found on the maritime ice surrounding the Antarctic Continent; it also would make effective the prohibition of the harvesting of some species, and would limit the capture of others, to avoid their extinction.

The Ninth Meeting of Consultation (London in 1977) adopted a recommendation concerning the establishment of the definitive regime of conservation. In 1978, several special meetings took place. A highlight of these meetings was the adoption of a Convention on the Conservation of Living Resources in Antarctica. This convention, signed in May 1980 in Australia, established an even broader range of application, extending to the line of Antarctic Convergence and establishing a scientific commission and committee.

The problem of oil, by the mid-70s, awakened a growing interest in the research and exploitation of nonrenewable resources. This concern was raised for the first time at the Sixth Consultative Meeting (Tokyo, 1970), but was analyzed in more detail at the Seventh Meeting (Wellington, 1972). Participants agreed to continue studying the issue, particularly the effects of possible exploitation on the Antarctic environment.

The Eighth Meeting, in Oslo, expanded the conclusions of Wellington—viewed as a delay in resolving a problem until it could be clarified definitively—in order to adopt an adequate regime. The Ninth Meeting, in London, took cognizance of a report by SCAR on the possible effects of mining exploration and exploitation. This report specifically mentioned oil, and pointed out dangers that might jeopardize the Antarctic environment. The London meeting concluded with a recommendation that the principles of Article IV of the Treaty, pertaining to sovereignty claims, must be safeguarded in their application to the area covered by the Treaty.

At the Tenth Meeting of Consultation in September 1979 in Washington, DC, preferential attention was given to problems of exploration and exploitation of nonrenewable resources (minerals and hydrocarbons) and their relationship to the environment. These activities represent obvious steps directed at future exploitation and marketing of nonrenewable resources.

With respect to exploitation, table 3 shows three blocs of nations with differing opinions.

Table 3
Opinions on exploitation of Antarctic resources

In favor	Against	Undefined
United States	Chile	New Zealand
Great Britain	Argentina	South Africa
Japan	Australia	
Belgium	Soviet Union	
Norway		
France		

So far, 11 Consultative Meetings have taken place, in addition to annual meetings held by SCAR. SCAR is the scientific organization advising Antarctic Treaty nations and also promotes conferences and some symposia on scientific matters submitted for consideration by signatory countries. During 17-28 January 1983, an informal consultative meeting of delegates was held in New Zealand; this meeting led to a formal meeting in July 1983 in the Federal Republic of Germany.

Juridical Aspects of the Treaty

The Antarctic Treaty is not only of extraordinary usefulness to the countries that subscribe to it, but it also has opened the way to other similar international agreements.

According to Article IX of the Treaty, the "Consultative Parties" have shown interest in Antarctica, through conducting important scientific research, such as the establishment of a scientific station or sending scientific expeditions. So far, 16 countries enjoy consultative member status.

The "Consultative Parties," in addition, may be claimants to sovereignty or non-claimant nations. Claimant nations, such as Chile, Argentina, Great Britain, New Zealand, Australia, France, and Norway, actually claim territorial sovereignty over certain sectors of Antarctica. In general, other countries participate occasionally in scientific activities or in joint expeditions.

In its more than 20 years of existence, the Antarctic Treaty (or the Washington Treaty, as it also is known) has helped establish a veritable "Antarctic System." It has become quite operative, with no other treaty resembling it, other than the Inter-American System, which will be 100 years old in 1990. The Antarctic Treaty ought to be included among the "Regional Agreements" referred to in articles 52, 53, and 54 of the Charter of the United Nations.

In case some controversy should arise in the interpretation or application of the Treaty, the parties are to resolve it among themselves, through peaceful means established by international law. These means include negotiation, investigation, conciliation, arbitration, or judicial decision. If the controversy cannot be resolved by these means, it must be submitted to the International Court of Justice, the main juridical body of the United Nations. Up to now, these measures have not been necessary.

The absence of a central organization to regulate, control, and otherwise administer the Antarctic Territory and its adjacent waters clearly shows that signers of the Antarctic Treaty did not pursue the internationalization of that continent, in order to favor the position of Third World countries, as some of the authors have purported.

Under the Treaty, prior claims over Antarctic sectors may not be reclaimed or extended. At present, a large sector located between areas claimed by Chile and New Zealand has not been claimed by anyone.

Another aspect of the Treaty worthy of note is that measures to be adopted, as noted in Article IX, will become effective when approved by all contracting parties. The Treaty established a rule of unanimity for its most important decisions, which in turn implies that the parties have the right to veto—in conditions of equality—unlike the Security Council of the UN, where this right is only held by



Mt. Terror forms a backdrop for this scene of ice floes in the Ross Sea, Antarctica.

the five great powers. This application of the principle of unanimity, though not recommended for newer international organizations, has brought good results in the Antarctic ambience, possibly because it deals with a small number of countries or applies to the discussion of technical or scientific matters.

20 Antarctica

The Antarctic Treaty has an indefinite duration. Its provisions may be modified at any time by the unanimous agreement of parties entitled to participate in its Consultative Meetings.

After 30 years of validity of the Treaty (1991), any of its signatory parties may call for a conference to review its operation, with the conference to be held as soon as possible after the call.

4. Chile's Interests in Antarctica

Geographical Aspects of the Chilean Antarctic Territory

THE CHILEAN ANTARCTIC TERRITORY (CAT) is located in the so-called "South American Sector of Antarctica." (See figure 3.)

Area

The CAT has an area of approximately 1,250,000 km² (482,625 square miles). It covers part of the Weddell Sea and the lands extending to the south, from meridian 53° west, the peninsula of O'Higgins Land, and the islands situated on its periphery as follow: Ross, Joinville, Shetland, Palmer, Biscoe, Adelaide, Alexander I, and Charcot; the Bellingshausen Sea; and the lands located to the south, up to meridian 90° west.

Boundaries

The government of President Pedro Aguirre Cerda, by Supreme Decree No. 1747, dated 6 November 1940, set the current limits of the Chilean Antarctic Territory as follows:

- To the north with the Chilean continental territory, from which it is separated by the Drake Passage.
- To the east with meridian 53° west of Greenwich.
- To the south with the South Pole.
- To the west with meridian 90° west of Greenwich.

The Chilean Antarctic Territory actually is a province of mainland Chile, the capital of which is the city of Puerto Williams; this province belongs to the 12th Chilean region, officially named "Magellan and Chilean Antarctica."

Description

The CAT covers all lands, islands, islets, reefs, glaciers, seas, straits, and canals that lie within the limits indicated above. The continental portions, which begin at the South Pole, reach approximately up to parallel 73° south, forming part of the land mass surrounding the Pole (figure 3). From that latitude, the continental portions advance toward the north, along the peninsula known as the "Land

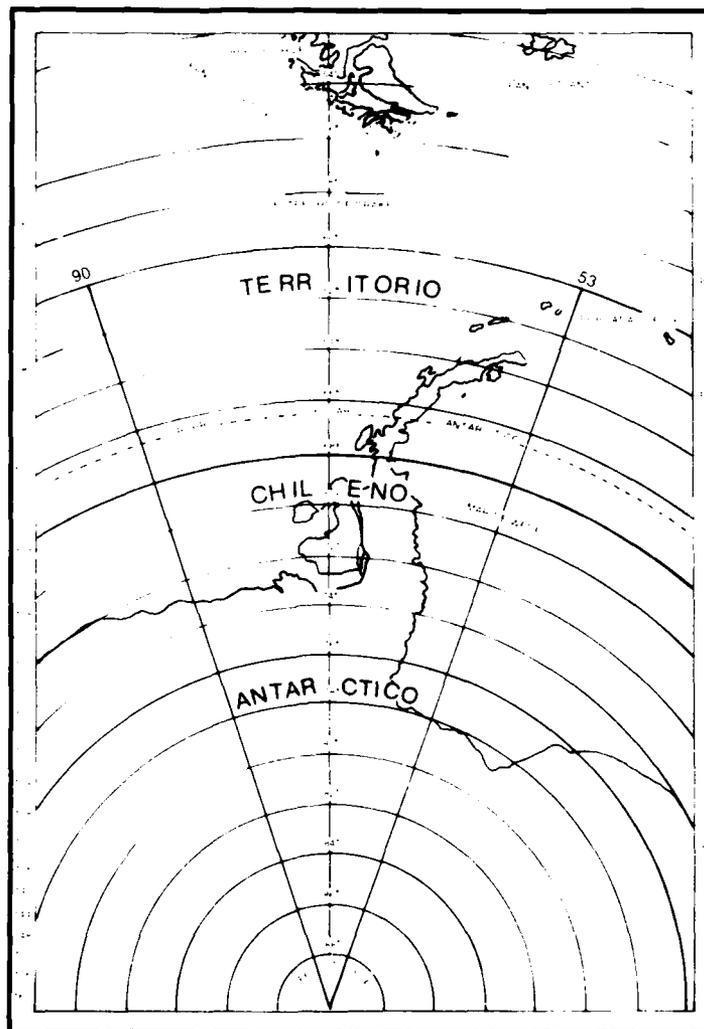


Figure 3. The Chilean Antarctic Territory (CAT)

of O'Higgins," in honor of the founding father of Chile, Bernardo O'Higgins Riquelme. In 1831, he highlighted the rights of Chile over Antarctica, reflecting the principle of *uti possidetis juris*, in which the boundaries of the Spanish colony corresponded to the nation that had just been liberated. O'Higgins, on his deathbed, addressed his last thoughts toward that faraway region of Chile, the CAT, thus orienting future generations.

The peninsula of O'Higgins Land is bathed in the east by the Weddell Sea, in the west by the Bellingshausen Sea, and in the north by the Bransfield Strait, which separates it from the South Shetland Islands. This peninsula constitutes one of the most notable geographical accidents of Antarctica. Long and narrow, it departs from the Antarctic Continent between the meridians 60° and 70° west, advancing to the north for some 1,300 kilometers (806 miles) to latitude 61° south.

Topography

The CAT includes mountainous areas, which surely are the geographical continuation of the Andean Range that runs along continental Chile from north to south, then submerges into the oceanic waters. (See figure 4.) The topography of O'Higgins Land is mountainous, very irregular, covered with snow, and shows extended sectors of naked rock on the sides of steep mountains. The altitudes of the peaks vary between 2,000 and 2,500 meters (between 6,560 and 8,200 feet) above sea level. Toward the east, these mountain chains extend into a

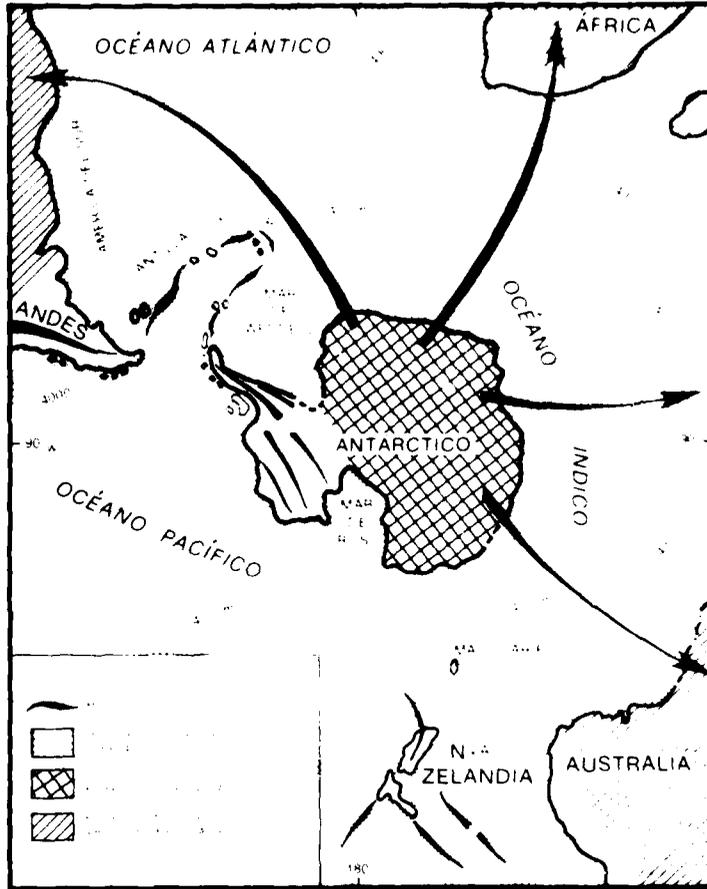


Figure 4. Connection between Continental Chile and Antarctic Chile

frozen plateau that reaches the coast. Toward the west, enormous glaciers reach to the sea, forming extensive and extremely deep bays.

Along the western coast of the peninsula, numerous islands emerge; they are separated from the continent by longitudinal channels of great length. These channels are very similar to the channels (canals) that exist in Chilean Patagonia.*

The eastern coast of the peninsula, on the other hand, is covered by fields of ice, which at some points extend to 200 kilometers (125 miles) off shore, presenting toward the Weddell Sea a continuous barrier of ice some 800 kilometers (500 miles) long, known as the Larsen Ice Shelf.

Climate

Antarctica in general can be considered as a true "exporter" of climates, because of the vast movements of masses of polar air and cold underwater currents that affect areas as far away as the Northern Hemisphere.

The climate of the CAT is a true mosaic, influenced by the South Pole and the continent. Maximum temperatures in summer are around +3° C (37.4° F). In the winter, the temperature drops to -35° C (-31° F) in O'Higgins Land.

*Chilean Patagonia, also known as *Los Canales*, or the Canal region, is located in the southernmost part of Chile, ranging from Chileo province southward to Magellanes province.

Rains are more frequent in the coastal sector and are heavy, because of the influence of the sea and the formation of clouds that produce greater humidity. The largest amount of snowfall, on the other hand, is on the inland plateaus, where the climate is drier, with prevailing strong winds of up to 320 kilometers (200 miles) per hour.

Fauna

The fauna of the CAT is quite varied and generally is composed of species capable of living in the Frozen Continent. These species include whales, sharks, sea lions, seals, and birds (such as penguins, Antarctic pigeons, skuas, and sea gulls).

Flora

The Antarctic Continent is considered the harshest environment in the world in which vegetal life survives. In spite of the prevailing harsh climatological conditions, during the summer months a few plant species develop in some of the more favorable locations; these locations include the northeast coast of O'Higgins Land and the islands facing O'Higgins Land, where the average temperature is about 0° C. The soil in which these plants grow is formed by remnants of prior vegetation and rock disintegration, fertilized by organic substances eliminated by animals that preferentially visit these ice-free areas.

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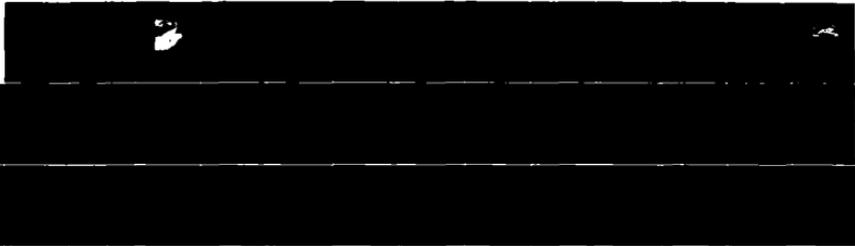
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88 *Antarctica*

More than 300 different species of lichens grow in Antarctica; some of these lichens also can be found in the Arctic. The best known Antarctic species of lichens are *Lecidea fusco-aira*, black in color; *Placodium murorum*, of a reddish-orange color; *Xantharia candelaria*; *Placopsis gelida*; *Neuropogon melaxanthum*, yellow in color; and *Gyrophora dilenii*, one of the largest in size.

Moss also is very abundant and covers great expanses. The best known genera are *Polytrichum*, *Brachythecium*, and *Hypnum*. Other species are *Deschampsia legantula*; *D. parvula*; *Colobanthus crassifolius*; *Prasiola antarctica*; and *Prasiola crispa*.

Transportation

Transportation between continental Chile and the CAT includes both maritime and air transport. Chile is one of four countries that have begun operating large airplanes (55,000 kilograms (60 tons)) to Antarctica, and the third to have multiple landing strips in that part of the world.

Mineral Resources

Oil is thought to exist in the great trench made up by the seas of Weddell, Bellingshausen, and Ross. Deposits of cobalt, gold, uranium, silver, iron, copper, manganese, zinc, antimony, and other minerals also are known.



Pressure ice shows these interesting ripples in the southern end of Kainan Bay in the Antarctic.

Historical and Juridical Data on the Interests of Chile over Antarctica

Two years after the discovery of America, on 7 June 1494, the Kingdoms of Spain and Portugal

signed the Treaty of Tordesillas. This treaty settled a new boundary line dividing the possessions of the two kingdoms. The new line ran from the North Pole to the South Pole, passing across a point situated 1,947 kilometers (1,207 miles) to the west of the Cape Verde Islands; this new line replaced the line 483 kilometers (300 miles) away that had been established the preceding year by the Papal Bull of Pope Alexander VI.

The Treaty of Tordesillas gave Spain the then almost unknown territories to the west of the previously noted line, and the territories to the east to Portugal. During the sixteenth century, Spain—by special decrees—gave jurisdiction of territorial dominion to the conquerors and governors who came to or were sent to America.

After the discovery of the Strait of Magellan (1520), geographers and cartographers were more convinced than ever of the ancient theory of Claudio Tolomeo, who maintained that a continent did exist around the South Pole. They published maps and charts based on the hypothesis that Tierra del Fuego was the beginning of that *Terra Australis*.

The first person ever to have rights over these lands was Pedro Sancho de la Hoy, who received them through a special decree signed by Emperor Charles V on 24 January 1539. This decree gave to de la Hoy all territories to the south of the Strait of Magellan, including Antarctica.

During the next two centuries, several other decrees by the Spanish sovereign confirmed that all lands to the south of the Drake Passage were part of

the Kingdom of Chile. These decrees include, for instance, the Royal Edict of 29 May 1555 appointing Jeronimo de Alderete Governor of Chile, and ordering him to reconnoiter the lands around the Strait of Magellan. In 1558, on the death of Jeronimo de Alderete, the King appointed Francisco de Villagra as Governor of Chile. The king also ordered him to reconnoiter lands located south of the strait, to inform him about them, and to consider "that possession be taken in our name of the lands and provinces which fall within the demarcation of the Crown of Castille, putting there crosses and signs and making the necessary statements in witness thereof." This Royal Edict added to the jurisdiction of Chile all lands and islands located south of the Strait of Magellan.

The British Crown, having come to colonize North America, recognized these rights by the Treaty of Madrid (8 July 1670) and confirmed them later by the Anglo-Spanish Treaties of 27 March 1713 and 28 October 1790.

During the Spanish colonial period, contiguous Antarctica invariably was united to the Governorship of Chile; the governor was sole depositary of the Spanish Crown's possessions in the land. This jurisdiction never was altered by any decree, war, or treaty.

The report, *Geographic and Hydrographic History of the Kingdom of Chile*, whose author was Governor Manuel Amat y Jument, was sent to the "Council of Indias" (Spain) in 1761. Governor Amat y Jument's history describes Patagonia, Tierra del Fuego, and Antarctic islands known at that time as parts of the Chilean territory.

In 1810, when Chile took the first steps toward independence, all the then new republics solemnly declared the *uti possidetis juris* of 1810. By this decree, each nation was to maintain the same territory that had belonged to it during the Spanish colonial period. A few years later, the American president, James Monroe (1817–1825), in his well-known Monroe Doctrine, was the first to recognize this *uti possidetis*. Clearly then, according to the *uti possidetis*, the Republic of Chile maintained its dominion over Antarctica down to the South Pole.

The first President of Chile, General Bernardo O'Higgins, was requested on 20 August 1821, by Captain Thomas Cochrane of the British Royal Navy, to state in writing the extensions and limits of the new republic. General O'Higgins' reply to Captain Cochrane clearly specified that the territorial possessions of Chile included the South Shetland Islands. (The South Shetland Islands were the only known part of the Antarctic sector of South America at that time.) Another part of this letter emphasizes that the South Atlantic Coast (later ceded to Argentina by the Treaty of 1881) also was part of the republic and that its extreme southern boundary was the South Pole itself. This letter is kept at the British Foreign Office in London.

The government of Chile passed, on 17 August 1892, a decree "regulating the fishing and hunting of seals, otters, etc. along the coasts, islands and territorial seas of Chile." In that same year, the Ministry of Foreign Affairs and the Governor of Punta Arenas exchanged notes on the best way to preserve Chilean rights in that area, in view of the flow of foreigners arriving there.

By considering legislation on this subject, Chile, in addition to its historical background of Antarctic dominion, became the first nation to take legal steps to preserve its sovereignty in the Antarctic region.

At the beginning of the twentieth century, Chilean whalers erected a base on Deception Island, which was tacitly recognized by all nations as a Chilean domain. In 1906, the Chilean government ordered the settlement of a base on Elephant Island. Unfortunately, the Valparaiso earthquake on 16 August 1906, and its dramatic consequences, forced the government to expend much of the country's resources in reconstruction and in the assistance of the victims, preventing it from carrying out its Antarctic program; the Elephant Island base was not established at that time.

The Chilean government, on 9 September 1939, created a Chilean Antarctic Commission to study all available data to determine limits of Chilean jurisdiction in Antarctica. This measure, which had not been necessary up to then, was considered opportune because Norway was arrogating for itself titles that threatened Chilean rights.

The government of Chile, by a note of 17 March 1939, reserved these rights and took similar action at the Conference of Havana, Cuba, in February 1940.

As a product of long and intensive studies, Supreme Decree No. 1747, signed by Chilean President Pedro Aguirre Cerda and his Minister of Foreign Affairs, came into effect on 6 November 1940. This decree, in its resolute part, states:

The Chilean Antarctic or Antarctic Chilean Territory is formed by all lands, islands, channels, pack-ices, known and to be known with their corresponding territorial seas, which are situated south of latitude 60° to the South Pole and between meridians 53° and 90° west of Greenwich.

Chile's Presence in Antarctica

In 1899, Dr. Arthur Wichmann, professor at the University of Amsterdam, published a study quoting the statements of Second Officer Lauren Claess, who said that he served with

Admiral Gabriel de Castilla with three ships along the coast of Chile towards Valparaiso and from there to the Strait of Magellan, and that was in the year 1603 and he went in March up to the 64° parallel where they found much snow, and the following month of April they came back to the coasts of Chile....

This testimony, and a document found in the National Historical Archives of Chile, permit the conclusion to be drawn that Admiral Gabriel de Castilla made the first exploration up to parallel 64°, departing from the coast of Chile. Other documents in Spanish archives, particularly in the hands of the governors of Peru, also provide references to the Antarctic navigation of Don Gabriel de Castilla who, before the discoveries by James Cook (toward the end of the eighteenth century), was the

first European to reach the edges of the Frozen Continent.

Gabriel de Castilla had been in Chile since 1596, when he took part in the War of Aranco to dominate the Mapuche Indians. Later, Alvaro Mendana de Neira (1567 and 1596), Pedro Fernandez de Quiroz (1605), Hernando Lamero, and Juan Fernandez sought in their turn to exploit the continent discovered by Castilla.

First to Find Sea Lions

In 1756, members of the crew of the Spanish merchant ship *Leon* not only saw the South Georgia Islands, but were the first to find sea lions in those latitudes. Don Domingo Ortiz died on board this ship at age 80. A former governor of Chile, he was interred in Antarctica, becoming the first Chilean to die in that region and be buried there.

Throughout the years, many other Chileans died in Antarctica while undertaking missions of safeguarding sovereignty and setting valuable scientific precedents. Some of these men include Lieutenants Ponce and Torrealba of the Chilean Army and Captain Ariel Gonzalez and Corporal Rojas of the Chilean Navy.

The interest in hunting seals and whales in the southern seas soon attracted the attention of several adventurers. In the period 1819-20, the first seal hunting expeditions were made by British and Americans explorers in Chilean Antarctica. The following year, 1821, no less than 44 ships hunted

sea lions. In 1821–22, the hunters grew to almost 100; that number continued to grow until the sea lion with the fine skin, or “double fur,” became extinct in 1830.

From 1872 until 1888, considerable interest was shown in the Antarctic seal, with national and foreign expeditions leaving from Punta Arenas in Chile. After 1888, only Chilean hunters ventured into the Antarctic seas. Jean Charcot recorded in the account of his trip (1908–10) that Chilean whalers on Deception Island (Chilean Antarctic Territory (CAT)) provided him with coal to continue his trip. The next year, 1911 Charcot returned and again the Chilean whalers provided him with coal to continue his explorations.

Magellan Whaling Society

In 1906, the “Magellan Whaling Society” was created in Punta Arenas. The society sent its fleet, under the command of Captain Adolfo Andresen, to occupy a part of Deception Island, after the Governor of Punta Arenas authorized the Society to establish a base there by Decree No. 1314 dated 1 December 1906. This fleet returned to Deception Island every year until 1914.

Between 1914 and 1916, the British expedition commanded by Sir Ernest Shackleton on board *Endurance* got trapped in Antarctic ice and was rescued after risky maneuvers by the Chilean ship *Yelcho*, under the command of pilot Luis A. Pardo. The expedition organized in 1939–41 by the United States, that traveled to Antarctica under the

command of Admiral Richard E. Byrd, included Chilean officers Federico Bonnert and Exequiel Rodriguez. Since 1940, the year in which Chilean President Pedro Aguirre Cerda signed Supreme Decree No. 1747 delineating the CAT, Chile has maintained a permanent and growing presence in Antarctica.

In 1946, the First Antarctic Commission was sent under the command of Commodore Federico Guesalago to reconnoiter the South Shetland Islands and the western coast of O'Higgins Land up to Marguerite Bay. To guarantee its sovereignty, Chile also began to settle armed forces bases in 1946. The first such base was the Naval Base *Arturo Prat*, established by Commodore Guesalago on 6 February 1947 and situated at 62° 30' south latitude and 59° 41' west longitude; this base was dedicated to activities such as communications, study of the ionosphere, and meteorology.

Army Base Built

In 1947, Chile's Second Antarctic Commission traveled to the Frozen Continent. In addition to making hydrographic soundings in reconnoitering the continental coastline of the Bransfield Strait, the commission built an army base. Chilean President Gabriel Gonzalez Videla made the first presidential visit to Antarctica in 1947. The Chilean Air Force also made its first flight to Antarctica in 1947. In 1949, 1950, 1953, and following years, the Chilean Air Force continued making reconnaissance and sovereignty flights over Antarctica.

The Army Base *General Bernardo O'Higgins*, situated at 63° 19' south latitude and 57° 54' longitude west of Greenwich, was established on 18 February 1948 to develop activities such as seismology, glaciology, and cartography. Thereafter, the Chilean government appointed and dispatched several Antarctic Commissions to organize and relieve army base personnel and to conduct reconnaissance and scientific studies.

The Air Force Base *Presidente Gabriel Gonzalez Videla* began activities on 12 March 1951 in marine biology and meteorology. This base is situated at 64° 49' south latitude and 63° 51' longitude west of Greenwich. At present, it is active during summer months. Another air Force Base, *Presidente Pedro Aguirre Cerda*, was inaugurated on 18 February 1955. It was dedicated to meteorological and vulcanological activities and was located at 62° 55' south latitude and 60° 36' longitude west of Greenwich. This base was destroyed by volcanic eruptions in 1967.

First Flight

On 28 and 29 December 1955, a Catalina aircraft of the Chilean Air Force flew for the first time between Punta Arenas and Deception Island, where it landed. On 22 December 1956, a Douglas DC-6B of the Chilean National Airline, with 66 tourists on board, made the first commercial flight with passengers to the Antarctic Continent, flying over Chilean bases without landing. In 1959, the Chilean State Maritime Enterprise organized the first commercial cruise to the Antarctic Continent, with 30



The junction of the Ross Ice Shelf and Ross Island marks the site of a major emperor penguin rookery in Antarctica. Mt. Terror is in the background.

tourists on board its motorship *Navarino*. The cruise lasted from 8 to 21 February 1959.

The Naval Base *Yelcho* was inaugurated on 18 February 1962 to develop biological research programs. Its location is at 64° 52' south latitude and 63° 64' west longitude. On 28 February of the following year (1963), the Naval Base *Comodoro*

Guesalgo was opened; it is located on Avian Island in Marguerite Bay, at 67° 48' south latitude and 68° 53' west longitude. Both bases are manned only during the Antarctic summers.

In order to further reinforce Chilean Antarctic awareness and coordinate activities, a Chilean Antarctic Institute was created in 1963 by Law of the Republic No. 15.266. According to its charter, the institute has a

principal mission of planning, orienting, and coordinating the scientific and technical activities of state organizations and private individuals duly authorized by the Ministry of Foreign Relations to conduct such activities in the Chilean Antarctic Territory or outside it by virtue of the Antarctic Treaty of 1 December 1959.

This organization reports to the Ministry of Foreign Relations and develops a vast effort for the benefit of the CAT.

Antarctic Institute

The Chilean Antarctic Institute has its headquarters in Santiago at No. 814 Avenue Luis Thayer Ojeda. The Institute has a well-stocked library on Antarctic themes and publishes periodicals on the CAT, such as: *Apuntes Antarticos* (Antarctic Notes); *Catastro de la Labor Cientifica del Instituto Antartico Chileno 1964-81* (a compilation of scientific work done by the Chilean Antarctic Institute for 1964-81); and the *Boletin Antartico Chileno* (Chilean Antarctic Bulletin). In addition, the Institute disseminates programs on Antarctica to high

schools, day care centers, labor unions, neighborhood associations, and other organizations.

In January 1983, the Institute organized a literary competition at the school level; the competition was won by two students of the A-101 High School of Santiago for a paper titled *Psychobiological Profiles of Man in Antarctica*. For their prize, both students traveled for a week to the CAT, where they were lodged at military bases.

In 1969, another President of Chile, Eduardo Frei Montalva, visited Antarctica. In that same year, the Air Force Base *Teniente Rodolfo Marsh* was inaugurated in *Bahia Fildes*, 62° 12' south latitude and 58° 55' longitude west of Greenwich. This base is designed to serve as an Antarctic weather and sea station; in addition, the base conducts ionospheric studies* and gathers remote perceptions of environmental data and geotechniques on landing strips.

In addition to the bases mentioned above, Chile has the following shelters: *Yankee Bay*, inaugurated in 1954 at Yankee Bay, latitude 62° 32' south and longitude 59° 48' west of Greenwich, and providing alternate housing for the Naval Base *Arturo Prat*. The *Copper Mine* refuge, inaugurated in 1957 in the area bearing the same name, located at latitude 62° 23' south and longitude 59° 40' west, and conducting studies of ornithology, soil, and sea biology. *Punta Spring* was opened in 1978 at Hughes Bay as

*Studies of the earth's atmosphere from an altitude of about 25 miles and extending outward 250 miles or more.

a refuge intended to foster studies of glaciology and geodetics; it is located at 64° 18' south latitude and 61° 03' longitude west of Greenwich.

Pinochet Visits Antarctica

In 1977, the current Chilean President, General Augusto Pinochet, visited Antarctica, becoming the third Chilean President to reach the soil of Chilean Antarctica. There, at Marguerite Bay (71st parallel), he deposited an urn with earth brought from all regions of Chile, conveying that the CAT is united to continental Chile and only physically separated from it by the Drake Passage.

On 12 February 1980, at 1846 hours at King George Island, two twin-engine Otter aircraft of the Chilean Air Force landed in the CAT, thus constituting the second and third Chilean Air Force aircraft to land in Antarctica. The following month (22 March 1980) a Hercules C-130 of the Chilean Air Force landed for the first time in *Bahia Fildes* (CAT).

In addition to the activities noted above, different Chilean scientific organizations have conducted intensive activities in the CAT. (Table 4 reflects recurring scientific activities that took place in the CAT between 1964 and 1981.)

The Chilean Air Force in November 1982 organized an expedition that remained in Antarctica 45 days with the purpose of opening a new base (*Chile Blanco*) with its own landing strip, located on Charcot Island (68° 43' south and 75° 0'

Table 4

Recurrence of scientific activities in the CAT

ACTIVITIES	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
EARTH/OCEAN SCIENCES																		
Geology and vulcanology	x	x			x	x	x	x	x		x		x	x	x	x		x
Glaciology							x		x	x				x	x			
Geodesy and cartography														x	x			
Geomagnetism										x								
Oceanography							x		x	x								x
Limnology									x	x								
BIOLOGICAL SCIENCES																		
Marine Mammals			x	x	x				x	x				x	x			x
Ornithology	x		x			x	x											x
Land botany														x	x	x	x	x
Marine biology	x																	x
Ecology of the soil	x	x	x		x	x	x		x	x								
Fish ecology									x	x				x	x	x	x	x
Inter-tidal ecology														x	x	x	x	
Benthonic communities							x		x	x				x	x			x
Human physiology														x	x			
Taxidermy							x											
DATA COLLECTING STATIONS																		
Seismological	x		x		x	x	x	x	x	x	x		x	x	x	x	x	x
Tidal surges/Tide tables											x		x	x	x	x	x	x
Meteorological	x		x		x													
Ionospheric															x	x		
Remote sensors															x	x	x	x

west). A settlement now is being built at this base, where families of personnel destined to remain in Antarctica will live.

Information Exchanged

In February 1983, several Chilean scientists—members of the 19th Antarctic Expedition—on board the Chilean motorship *Capitan Luis Alcazar* visited the Palmer Archipelago and US, Argentinian, and Polish bases. The scientists exchanged information on scientific programs conducted by each country, especially in biological areas and in relation to krill. The Chilean scientists also advised five Brazilian experts, who stayed several days of that same month at the *Teniente Marsh* base while working on a special project connected with the geological area.

The policy that Chile has resolved to apply permanently in the CAT encompasses, among other things, the following aspects:

- Defense and maintenance of the rights of sovereignty in that part of the national territory.
- Maintenance, reinforcement, and consolidation of the presence of Chile in the CAT, by detachment of scientific personnel on a permanent basis at current bases; modernization of equipment at these bases; establishment of new bases and settlements toward the South Pole; and connection of the CAT with the continent and Easter Island by air and navy transport, thus connecting all of Chile.

- With regard to scientific research, the Chilean policy toward Antarctica considers the following: increasing action and disciplines of study toward resources in general; developing greater knowledge of CAT territories located toward the South Pole; and continually supporting the Chilean Antarctic Institute in its activities.

Internationally, Chile seeks a greater rapprochement with those signatories of the Antarctic Treaty that maintain common positions and wish to find formulas of understanding with those countries having territorial claims. Chile also wishes to prevent problems of the Frozen Continent from being considered outside the Antarctic Treaty. Likewise, it ardently opposes the internationalization of the Antarctic region.

In spite of limited economic resources, Chile has made enormous efforts to maintain its sovereignty and scientific development in the CAT, on the one hand, and take part in international activities relating to Antarctica on the other. The Chilean people have a clear and definite "Antarctic awareness." Chile looks with concern at the future of this part of its national territory. Chile feels it is unquestionably entitled to this territory because of geographical continuity, proven historical antiquity, contiguousness of continental territory, and maintenance of a permanent and growing scientific activity in that part of the world.

Appendix

The Antarctic Treaty

(Signed at Washington, DC, 1 December 1959)

The Governments of Argentina, Australia, Belgium, Chile, the French Republic, Japan, New Zealand, Norway, the Union of South Africa, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

Recognizing that it is in the interest of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become that scene or object of international discord;

Acknowledging the substantial contributions to scientific knowledge resulting from international cooperation in scientific investigation in Antarctica;

Convinced that the establishment of a firm foundation for the continuation and development of such cooperation on the basis of freedom of scientific investigation in

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Antarctica as applied during the International Geophysical Year accords with the interests of science and the progress of all mankind;

Convinced also that a treaty ensuring the use of Antarctica for peaceful purposes only and the continuance of international harmony in Antarctica will further the purposes and principles embodied in the Charter of the United Nations;

Have agreed as follows:

Article I

1. Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapons.

2. The present treaty shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose.

Article II

Freedom of scientific investigation in Antarctica and cooperation toward that end, as applied during the International Geophysical Year, shall continue, subject to the provisions of the present treaty.

Article III

1. In order to promote international cooperation in scientific investigation in Antarctica, as provided for in Article II of the present treaty, the Contracting Parties agree that, to the greatest extent feasible and practicable:

(a) information regarding plans for scientific programs in Antarctica shall be exchanged to permit maximum economy and efficiency of operations;

(b) scientific personnel shall be exchanged in Antarctica between expeditions and stations;

(c) scientific observations and results from Antarctica shall be exchanged and made freely available.

2. In implementing this article, every encouragement shall be given to the establishment of cooperative working relations with those Specialized Agencies of the United Nations and other international organizations having a scientific or technical interest in Antarctica.

Article IV

1. Nothing contained in the present treaty shall be interpreted as:

(a) a renunciation by any Contracting Parties of previously asserted rights of or claims to territorial sovereignty in Antarctica;

(b) a renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in

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Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;

(c) prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's right of or claim or basis of claim to territorial sovereignty in Antarctica.

2. 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. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present treaty is in force.

Article V

1. Any nuclear explosions in Antarctica and the disposal there of radioactive waste material shall be prohibited.

2. In the event of the conclusion of international agreements concerning the use of nuclear energy, including nuclear explosions and the disposal of radioactive waste material, to which all of the Contracting Parties whose representative are entitled to participate in the meetings provided for under Article IX are parties, the rules established under such agreements shall apply in Antarctica.

Article VI

The provisions of the present treaty shall apply to the area south of 60° South Latitude, including all ice shelves, but nothing in the present treaty shall prejudice or in any way affect the rights, or the exercise of the rights, of any state under international law with regard to the high seas within that area.

Article VII

1. In order to promote the objectives and ensure the observance of the provisions of the present treaty, each Contracting Party whose representatives are entitled to participate in the meetings referred to in Article IX of the treaty shall have the right to designate observers to carry out any inspection provided for by the present article. Observers shall be nationals of the Contracting Parties which designate them. The names of observers shall be communicated to every other Contracting Party having the right to designate observers, and like notice shall be given of the termination of their appointment.

2. Each observer designated in accordance with the provisions of paragraph 1 of this article shall have complete freedom of access at any time to any or all areas of Antarctica.

3. All areas of Antarctica, including all stations, installations, and equipment within those areas, and all ships and aircraft at points of discharging or embarking cargoes or personnel in Antarctica, shall be open at all times to inspection by any observer designated in accordance with paragraph 1 of this article.

4. Aerial observation may be carried out at any time over any or all areas of Antarctica by any of the Contracting Parties having the right to designate observers.

5. Each Contracting Party shall, at the time when the present treaty enters into force for it, inform the other Contracting Parties, and thereafter shall give them notice in advance, of:

(a) all expeditions to and within Antarctica, on the part of its ships or nationals, and all expeditions to Antarctica organized in or proceeding from its territory;

(b) all stations in Antarctica occupied by its nationals; and

(c) any military personnel or equipment intended to be introduced by it into Antarctica subject to the conditions prescribed in paragraph 2 of Article I of the present treaty.

Article VIII

1. In order to facilitate the exercise of their functions under the present treaty, and without prejudice to the respective positions of the Contracting Parties relating to jurisdiction over all other persons in Antarctica, observers designated under paragraph 1 of Article VII and scientific personnel exchanged under subparagraph 1(b) of Article III of the treaty, and members of the staffs accompanying any such persons, shall be subject only to the jurisdiction of the Contracting Party of which they are nationals in respect to all acts or omissions occurring while they are in Antarctica for the purpose of exercising their functions.

2. Without prejudice to the provisions of paragraph 1 of this article, and pending the adoption of measures in pursuance of subparagraph 1(e) of Article IX, the Contracting Parties concerned in any case of dispute with regard to the exercise of jurisdiction in Antarctica shall

immediately consult together with a view to reaching a mutually acceptable solution.

Article IX

1. Representatives of the Contracting Parties named in the preamble to the present treaty shall meet at the City of Canberra within two months after the date of entry into force of the treaty, and thereafter at suitable intervals and places, for the purpose of exchanging information, consulting 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, including measures regarding:

- (a) use of Antarctica for peaceful purposes only;
- (b) facilitation of scientific research in Antarctica;
- (c) facilitation of international scientific cooperation in Antarctica;
- (d) facilitation of the exercise of the rights of inspection provided for in Article VII of the treaty;
- (e) questions relating to the exercise of jurisdiction in Antarctica;
- (f) preservation and conservation of living resources in Antarctica.

2. Each Contracting Party which has become a party to the present treaty by accession under Article XIII shall be entitled to appoint representatives to participate in the meetings referred to in paragraph 1 of the present

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article, during such times 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.

3. Reports from the observer referred to in Article VII of the present treaty shall be transmitted to the representatives of the Contracting Parties participating in the meetings referred to in paragraph 1 of the present article.

4. The measures referred to in paragraph 1 of this article shall become effective when approved by all the Contracting Parties whose representatives were entitled to participate in the meetings held to consider those measures.

5. Any or all of the rights established in the present treaty may be exercised as from the date of entry into force of the treaty whether or not any measures facilitating the exercise of such rights have been proposed, considered or approved as provided in this article.

Article X

Each of the Contracting Parties undertakes to exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity in Antarctica contrary to the principles or purposes of the present treaty.

Article XI

1. If any dispute arises between two or more of the Contracting Parties concerning the interpretation or application of the present treaty, those Contracting Parties shall consult among themselves with a view to having the dispute resolved by negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement or other peaceful means of their own choice.

2. Any dispute of this character not so resolved shall, with the consent, in each case, of all parties to the dispute, be referred to the International Court of Justice for settlement; but failure to reach agreement on reference to the International Court shall not absolve parties to the dispute from the responsibility of continuing to seek to resolve it by any of the various peaceful means referred to in paragraph 1 of this article.

Article XII

1. (a) The present treaty may be modified or amended at any time by unanimous agreement of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX. Any such modification or amendment shall enter into force when the depositary government has received notice from all such Contracting Parties that they have ratified it.

(b) Such modification or amendment shall thereafter enter into force as to any other Contracting Party when notice of ratification by it has been received by the depositary government. Any such Contracting Party from which no notice of ratification is received within a period

of two years from the date of entry into force of the modification or amendment in accordance with the provisions of subparagraph 1(a) of this article shall be deemed to have withdrawn from the present treaty on the date of the expiration of such period.

2. (a) If after the expiration of thirty years from the date of entry into force of the present treaty, any of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX so requests by a communication addressed to the depositary government, a Conference of all the Contracting Parties shall be held as soon as practicable to review the operation of the treaty.

(b) Any modification or amendment to the present treaty which is approved at such a conference by a majority of the Contracting Parties there represented, including a majority of those whose representatives are entitled to participate in the meetings provided for under Article IX, shall be communicated by the depositary government to all the Contracting Parties immediately after the termination of the conference and shall enter into force in accordance with the provisions of paragraph 1 of the present article.

(c) If any such modification or amendment has not entered into force in accordance with the provisions of subparagraph 1(a) of this article within a period of two years after the date of its communication to all the Contracting Parties, any Contracting Party may at any time after the expiration of that period give notice to the depositary government of its withdrawal from the present treaty; and such withdrawal shall take effect two years after the receipt of the notice by the depositary government.

Article XIII

1. The present treaty shall be subject to ratification by the signatory states. It shall be open for accession by any state which is a Member of the United Nations, or by any other state which may be invited to accede to the treaty with the consent of all the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX of the treaty.

2. Ratification of or accession to the present treaty shall be effected by each state in accordance with its constitutional processes.

3. Instruments of ratification and instruments of accession shall be deposited with the Government of the United States of America, hereby designated as the depositary government.

4. The depositary government shall inform all signatory and acceding states of the date of each deposit of an instrument of ratification or accession, and the date of entry into force of the treaty and of any modification or amendment thereto.

5. Upon the deposit of instrument of ratification by all the signatory states, the present treaty shall go into force for those states and for states which have deposited instruments of accession. Thereafter the treaty shall enter into force for any acceding state upon the deposit of its instrument of accession.

6. The present treaty shall be registered by the depositary government pursuant to Article 102 of the Charter of the United Nations.

Article XIV

The present treaty, done in the English, French, Russian, and Spanish languages, each version being equally authentic, shall be deposited in the archives of the Government of the United States of America, which shall transmit duly certified copies thereof to the governments of the signatory and acceding states.

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The Author

Brigadier Luis H. Mericq began his career as an infantry officer in the Army of Chile in 1954. In 1976, as a lieutenant colonel, he was appointed the United Nations Military Observer to India and Pakistan during the Jammu and Kashmir conflict in northwest India. At the end of this tour of duty, he was awarded the Medal of Peace. He was promoted to full Colonel in the Army of Chile in 1978 and was Commander of the Army Garrison in Valparaiso from 1979 to 1981. From 1982 to 1984, he was an Adviser to the Inter-American Defense College at Fort McNair in Washington, D.C., and an International Research Fellow at the National Defense University where he wrote this book. He received the Medal of the Inter-American Defense Board in 1982, and was promoted to the rank of Brigadier in 1983.

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