



Antarctica

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This essay focuses on the history of the exploration and governance of the Antarctic region. I discuss the political and economic history of the Falkland Islands and South Georgia, the early exploration of Antarctica, the race for the South Pole, Ernest Shackleton's *Endurance* expedition, and the ownership and governance of Antarctica. I wrote these lectures for the Antarctica Expedition sponsored by Stanford Travel/Study and Zegrahm Expeditions in January 2009.

I first contrast the Falkland Islands and South Georgia – their major exports under British colonization, the causes of the South Atlantic War (1982) between the United Kingdom and Argentina, and the reasons for the economic boom after the war. I next look at the early exploration of the Antarctic region, the contestants in the race to be the first to reach the South Pole, and why Roald Amundsen, a Norwegian, won the race over Robert Falcon Scott and Ernest Shackleton, both Englishmen. I then discuss how Antarctica is governed under the Antarctic Treaty, what commercial and touristic uses are permitted, and how the environment of the Antarctic region is protected. A time line, bibliography, and description of sites visited in Antarctica are appended.

The Falklands and South Georgia (1592-present)

Exploration and Sovereignty. The Falkland Islands and South Georgia have had intersecting histories. Both groups of islands are sited in the South Atlantic Ocean, between 50 and 55 degrees south latitude. The Falklands (4,700 square miles) are located 300 miles east of southern Argentina, whereas South Georgia (1,450 square miles) is 870 miles east of the Falklands. Neither had human habitation at European contact. The Falklands have had a greater role in European history, because they are larger, have a milder climate, can support animal agriculture, and are located near the Cape Horn trade route around South America.

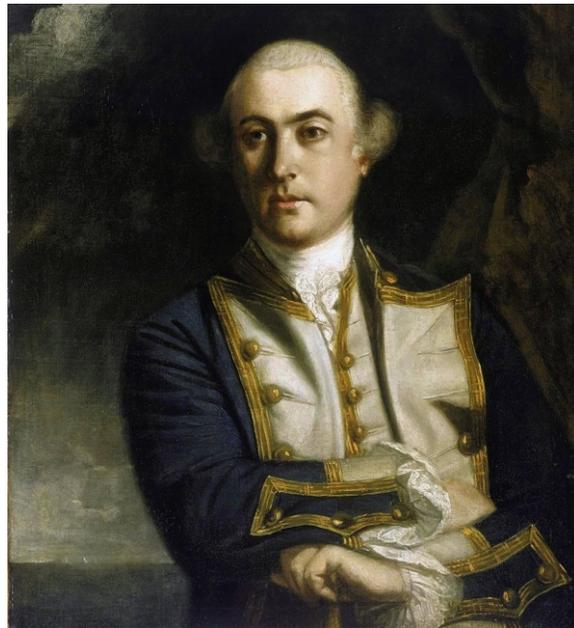


Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Falklands_Map.GIF>

The Falkland Islands, Administered by the United Kingdom

John Davis of the British Navy first discovered the Falklands in 1592. The first recorded landing on the Falklands, by John Strong, an English naval captain, occurred in 1690. Strong named the archipelago after Lord Falkland, the First Lord of the Admiralty. In 1764, a French

entrepreneur, Antoine de Bougainville, established the first settlement – at Port Louis on East Falkland Island. Commodore John Byron claimed the islands for Britain in 1765 and built Port Egmont on West Falkland Island.

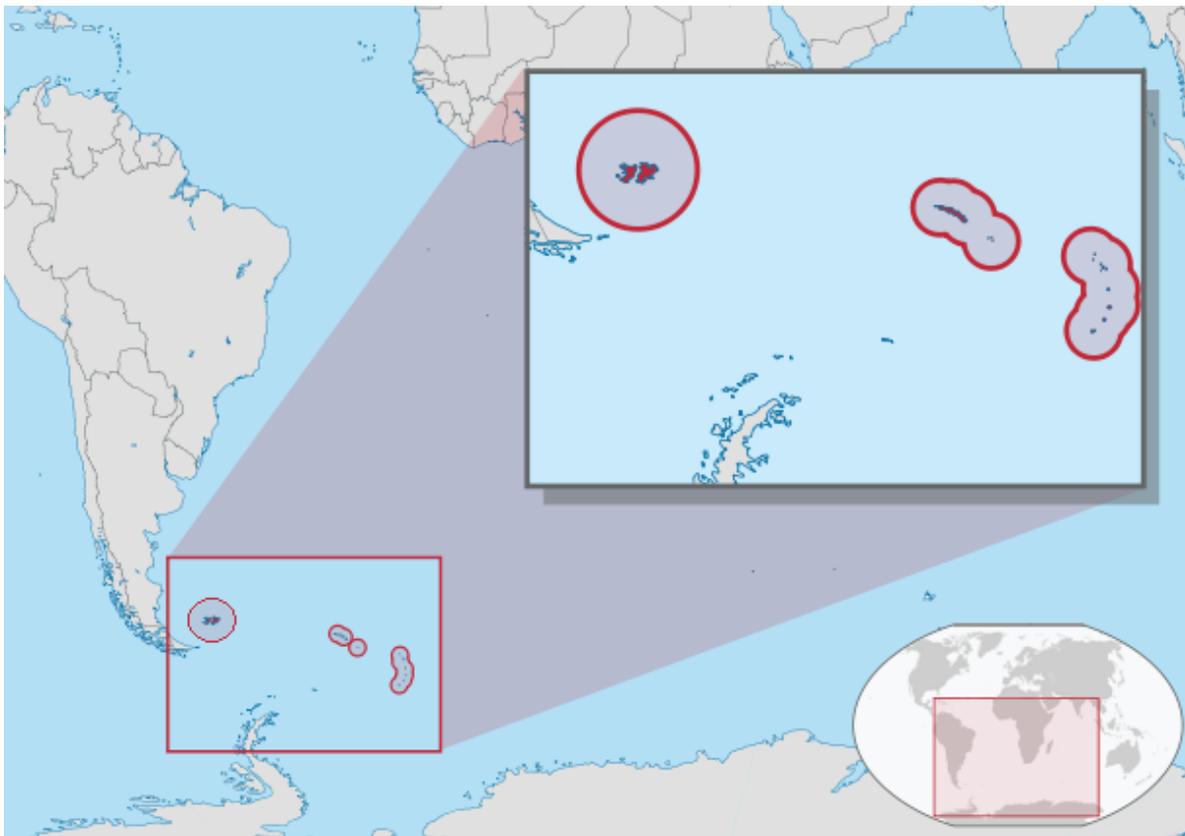


Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:John_Byron-Joshua_Reynolds-1759.jpg>

Commodore John Byron (1723-1786), Claimed the Falkland Islands for Great Britain in 1765 – Portrait by Joshua Reynolds, 1759

Spain, furious at French and English incursions on American territory confirmed as Spanish in the Treaty of Utrecht in 1713, bought out France's interest and forcibly evacuated the British. Spain then governed the Islas Malvinas from 1767 until 1806. No formal

government existed between 1806 and 1820, so the captains of sealing and whaling vessels dispensed justice. Newly independent Argentina governed the islands between 1820 and 1833, when Britain invaded, evacuated the Argentinian settlers, and established a colony.

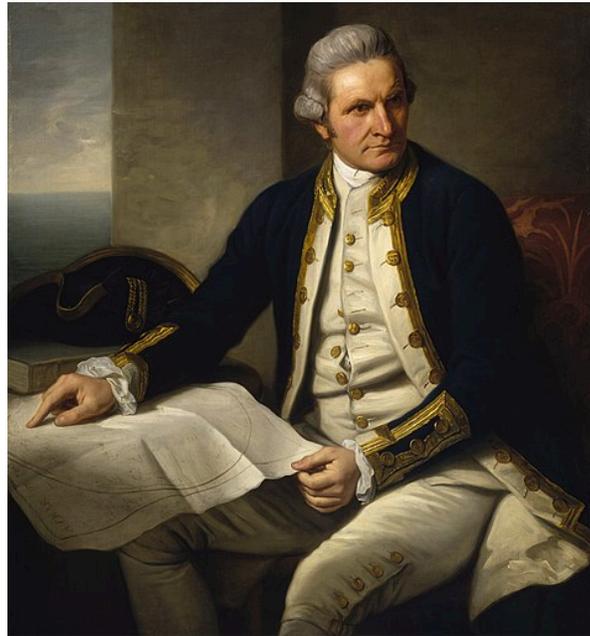


Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Falkland_Islands,_South_Georgia_and_South_Sandwich_Islands.png>

The Falkland Islands, South Georgia, and the South Shetland Islands – Britain Colonized All Three

The early politics of South Georgia are much less complicated. An English merchant, Antoine de la Roché, discovered that island in 1675.

England claimed sovereignty in 1775 when Captain James Cook on the *Resolution* charted the coast, landed in Possession Bay, claimed the island for England, and named it “Georgia” after King George III.



Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:Captainjamescookportrait.jpg>>

*Captain James Cook (1728-1779), Claimed South Georgia in 1775 –
Portrait by Nathaniel Dance-Holland, 1775,
National Maritime Museum, London*

In 1887, South Georgia was entered in the *Colonial Year Book* as a British dependency. The permanent settlement of South Georgia began in 1904 when Norwegian whalers set up a shore station at Grytviken. The United Kingdom established its first government in 1909 and sent a Magistrate to rule as a representative of the Governor in the Falklands.



Source: *Wikimedia Commons, available at*
<https://commons.wikimedia.org/wiki/File:South_georgia_Islands_map-en.svg>

South Georgia, Administered by the United Kingdom

Sealing. The first major economic activity in both the Falkland Islands and South Georgia was sealing. Sealers, in ships from Europe and the United States, sought two species of seals – the Antarctic fur seal and the southern elephant seal. The Antarctic fur seal is a modest-sized sea mammal (males weigh up to 440 pounds) that feeds on krill (tiny, shrimp-like seafood) supplemented by fish and squid. The glossy fur pelts (skins) of fur seals were of high commercial value. The pelts

were salted for packing and shipped to China for use as felt or leather for gloves, boots, and shoes or to Europe or North America for use in making garments. The commercial slaughter of fur seals began in the Falklands in 1784 when 13,000 pelts were exported to the United States. The fur seal population of the Falklands was heavily depleted by the 1790s, although harvesting continued through the 1830s. Fur seals in the Falklands numbered only 14,000 in a 1965 study.



Source: *Wikimedia Commons*, available at
<https://commons.wikimedia.org/wiki/File:Antarcticfurseal_kinggeorgeisland.jpg>

Male Antarctic Fur Seal (Arctocephalus gazella)

Fur sealing was a more important activity in South Georgia. The first seals there were taken in 1786. Commercial harvesting peaked

around 1800 and then continued at declining levels through the 1890s. In the 20th century, the fur seal population in South Georgia made a remarkable recovery – from near extinction to 1.8 million currently.

Commercial harvesting of the southern elephant seal was even more significant, especially in South Georgia. The southern elephant seal is a huge sea mammal (males weigh up to four tons) that feeds on a diet of squid supplemented by fish. Sealers produced oil from elephant seal blubber, which was used in Europe and America for lighting, lubrication, and textile processing.



Source: *Wikimedia Commons*, available at
<<https://commons.wikimedia.org/wiki/File:MacquarieIslandElephantSeal.JPG>>

*Male Southern Elephant Seals (Mirounga leonina) –
Fighting to Control Breeding Territory*

Elephant seals in the Falklands were heavily depleted in the late 18th century and had largely disappeared by the 1830s. Their numbers had gradually recovered to 19,000 in 1965.

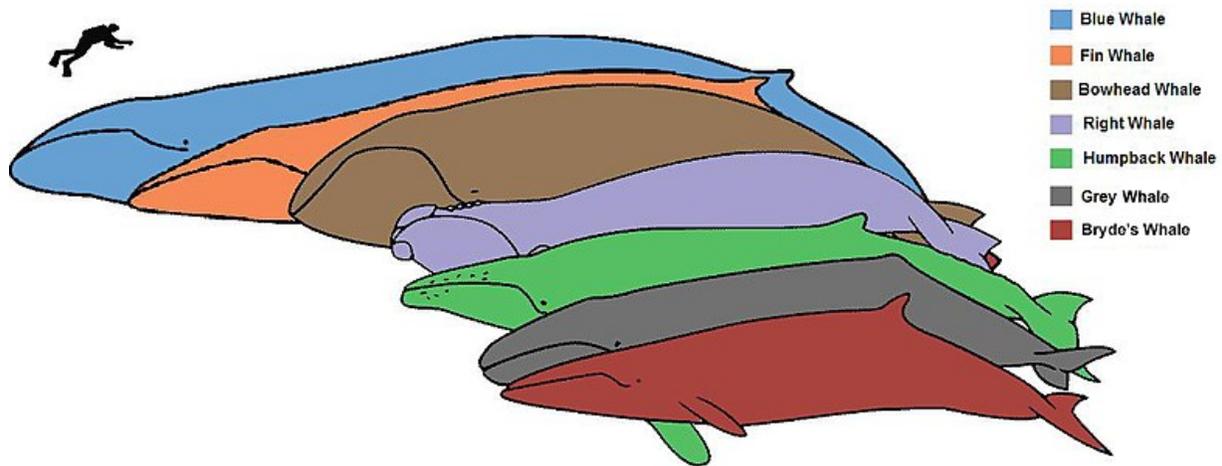
Elephant seals were harvested in two epochs in South Georgia. Uncontrolled harvests produced peaks about 1800 and 1820 and then a gradual decline through the remainder of the 19th century. Controlled harvests under British governance (1909-1965) led to the killing of 260,000 seals and the production of 84,000 tons of seal oil. The production of seal oil was an adjunct of whale oil production. When the last whaling station closed in 1965, the harvesting of elephant seals stopped. The South Georgian population of elephant seals today is about 300,000 and stable.



*Source: Wikimedia Commons, available at
<[https://commons.wikimedia.org/wiki/File:Southern_Elephant_Seal_05\(js\).jpg](https://commons.wikimedia.org/wiki/File:Southern_Elephant_Seal_05(js).jpg)>*

Southern Elephant Seals, Hauling Out – South Georgia

Whaling. Whaling was the primary economic activity in the Falkland Islands during the first century of human settlement (1770s-1860s), and it was the basis of habitation in South Georgia for six decades in the 20th century (1904-1965). In the first half of the 19th century, southern right whales commonly were harvested in and from the Falklands. But most of the whales processed in South Georgia were rorqual (fin, blue, and sei) whales -- baleen (toothless) whales that fed mostly on krill.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Baleen_whale_sizes.JPG>

*Size Comparison of Whale Species –
Blue (Blue), Fin (Orange), Bowhead (Brown), Right (Purple),
Humpback (Green), Grey (Gray), and Bryde's (Red)*

During the 19th century, Antarctic whales produced two valuable products – oil, used for lighting, soap, and lubricating, and baleen, used in making women's clothing and parasols. Oil from petroleum and oilseeds later substituted for whale oil in lighting and lubricating, and spring steel and plastics replaced baleen. During the 20th century, rorqual whales were processed in South Georgia for oil for use in soaps, margarine, cooking fat, and glycerol.

New Island, off West Falkland, was the primary center for whaling in the Falklands from the 1770s through the 1830s. The British created

a new port, Stanley, in 1845 to serve as a port of call for whalers and other ships using the Cape Horn trade route. Stanley prospered for a quarter century, but then lost out to Punta Arenas in southern Chile because that port could supply coal to the new steam ships.

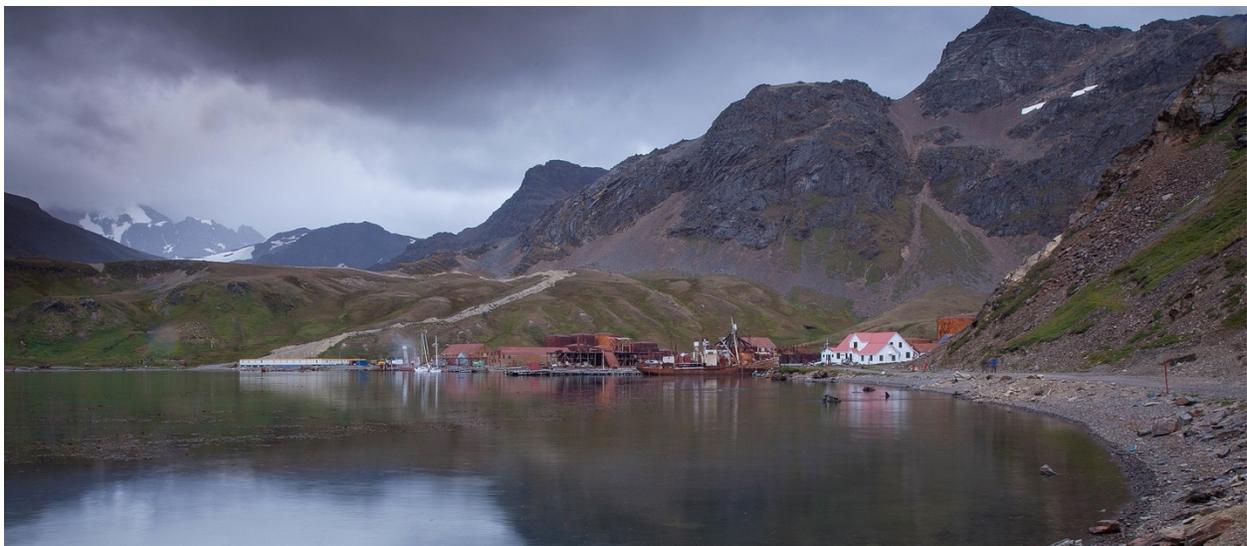


*Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:New_Island_Whaling_Station.jpg>*

*Former Whaling Station, New Island, West Falkland, Pictured c. 1910 –
Currently A Nature Reserve*

Whaling in South Georgia began in 1904 when Carl Anton Larsen, a Norwegian whaler and entrepreneur, established a shore station at Grytviken for his Argentine-financed firm, Compania Argentina de

Pesca. At its peak in 1917, the South Georgian whaling industry had six operating shore stations that employed 1,000 workers in the whaling (summer) season and 200 through the winter. Most of those workers were Norwegians from Vestfold province, Norway – many of them highly skilled technicians in the self-sufficient stations. Glycerol from whale oil was a critical input into producing nitroglycerine for explosives in World War I.

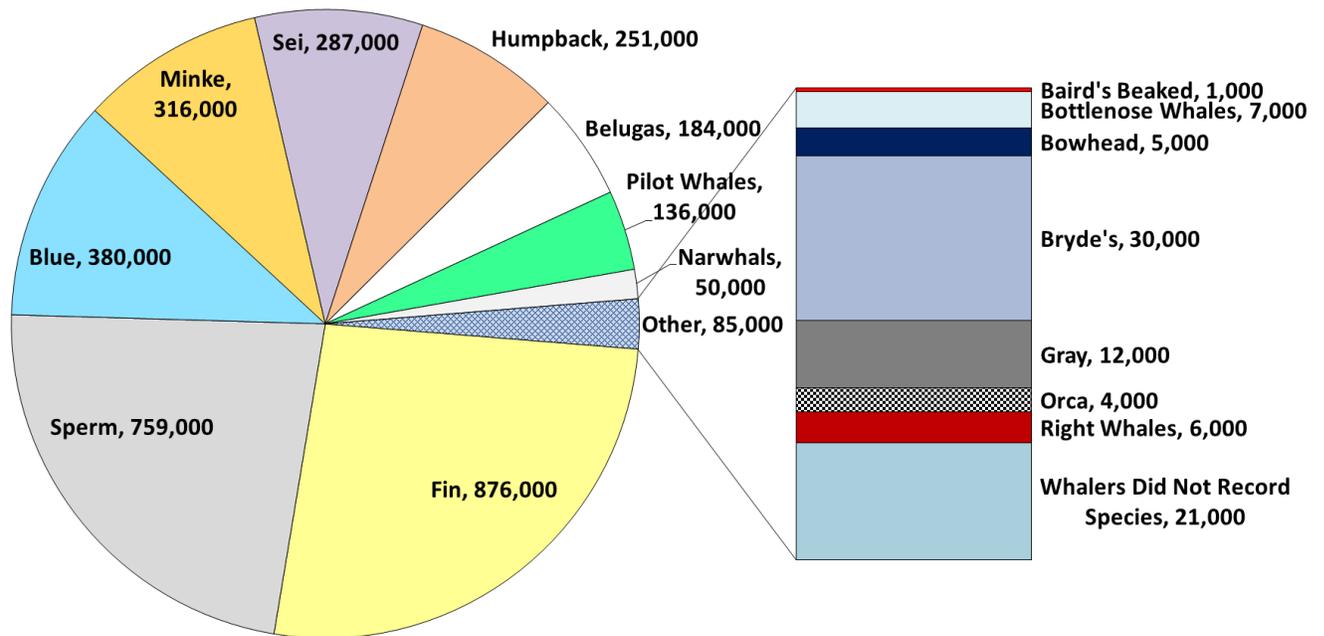


Source: Wikimedia Commons, available at
[h<https://commons.wikimedia.org/wiki/File:Grytviken20090110-IMG_0743_\(16094671225\).jpg>](https://commons.wikimedia.org/wiki/File:Grytviken20090110-IMG_0743_(16094671225).jpg)

Whaling Station, Grytviken, South Georgia – Operated 1904-1965

After 1930, the introduction of large factory whaling ships undercut shore stations and initiated the decline of the South Georgian industry. In its six decades of operation, the South Georgian whaling

industry processed 175,000 whales (83 percent were norquals) of the 1.5 million whales taken in Antarctica between 1900 and 1965. Recent whale populations in the Antarctic are estimated to be only about 1-10 percent of their levels at the beginning of the 20th century. In 1986, the International Whaling Commission voted to cease whaling of all large species, pending study of whale populations. Japan, Norway, and the USSR objected and continued whaling under the guise of scientific research.



Source: Wikimedia Commons, available at https://commons.wikimedia.org/wiki/File:Whaling_Species_since_1900.png

Whales Caught By Species, 1900-2015 – Three Million, World Total

Cattle and Sheep. The widespread domestication of animals has not been feasible in South Georgia. But cattle and sheep have been central to the economy of the Falkland Islands during the past 170 years. Antoine de Bougainville, the French colonizer of East Falkland, first introduced cattle in 1764 by importing seven heifers and two bulls. Feral cattle thrived on the natural pastures of the Falklands, and the wild herd grew to 40,000 animals by 1840. The Falklands' cattle herd was comparable in quality to those in Argentina and California that were exploited for hides (shoe leather) and tallow (soap). In 1846, Samuel Lafone obtained grants from the British government to slaughter the wild cattle and to farm much of East Falkland.



Source: *Wikimedia Commons*, available at [https://commons.wikimedia.org/wiki/File:Argentinian_Gaicho_1870_\(01\).jpg](https://commons.wikimedia.org/wiki/File:Argentinian_Gaicho_1870_(01).jpg)

Argentine Gauchos Operated in the Falkland Islands in the 1840s

The feral cattle herd disappeared rapidly under his efficient slaughter, and cattle declined in importance thereafter as attention shifted to domesticated sheep. In 1851, the Falkland Islands Company (FIC) purchased Lafone's landholdings in the Falklands, and in 1852, the London-based private company obtained a royal charter from Queen Victoria. The FIC received rights to operate 1.3 million acres in the Falklands (46 percent of total farmland). Subsequently, other large, absentee, private companies purchased estates in the Falklands so that in

the 1980s twenty-two private companies operated virtually all of the Falklands' 2.9 million acres of pasture-land.

The FIC and the other agricultural companies specialized in the production of high quality wool from sheep. In the 1850s, the FIC introduced English Cheviot and Southdown sheep breeds to replace the Argentine breeds imported earlier. The size of the sheep flocks in the Falklands increased dramatically – from 8,000 in 1859 to a peak of 807,000 in 1898 before settling in the 1990s at about 600,000.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Cheviot_ewe_and_lamb.jpg>

*Cheviot Ewe and Lamb –
Brought to the Falklands by English Ranchers in the 1850s*

In the 2010s, the number of sheep in the Falklands declined to 490,000. The high quality wool from the Falklands is exported to the United Kingdom where it is used to make hand-knit and quality machine-made garments.

From the 1860s to the 1980s, the economy of the Falklands rose and fell with fluctuations in the world price of wool. During much of the past three decades, wool prices have been depressed due to a combination of production gluts, market loss to synthetic fibers, and questionable policies in major producing countries (notably Australia). Accordingly, the Falklands' wool economy has suffered. In 1991, the FIC sold its landholdings to the government, which set up the Falkland Landholdings Limited to manage four large farms that constitute one-fourth of pasture-land. There are now 82 owner-managed farms in the Falklands, with an average size of 34,200 acres. Each farm runs 6,000 sheep on average. Many Falklands farms are struggling, and all benefit from government subsidies.



*Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:Falkland-Islands-Company.JPG>>*

*Former Headquarters of the Falkland Islands Company --
Since 1991, A Tourist Destination*

Causes of the South Atlantic War (1982). Argentina has consistently claimed that it deserves to have sovereignty over the Falklands (called the *Islas de Malvinas* by Argentina). In 1908, Argentina extended that claim to South Georgia, the South Sandwich, Orkney, and Shetland Islands and Graham Land when the United Kingdom unilaterally declared sovereignty over those areas and called them the Falkland Islands Dependencies. Argentina argues that Britain

confirmed Spain's rights to the South Atlantic territories in the Treaty of Utrecht of 1713, Spain established the first effective government in the Falklands (1767-1806), and Argentina inherited and resumed Spanish rule (1820-1833). Britain illegally invaded in 1833, evacuated the (few) Argentine settlers, and refused future immigrants from Argentina.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Islas_Malvinas-es.png>

Argentina Claims the Islas de Malvinas (the Falkland Islands) – Historical Rights and Early Occupation

The British case rests on discovery, occupation, effective government (in the Falklands from 1833 and in South Georgia from 1909), and the right of self-determination of existing residents. In 1965,

the United Nations passed a resolution on the decolonization of the Falklands, mandating that the United Kingdom and Argentina enter into discussions.

Diplomatic negotiations between Britain and Argentina reached a highpoint in 1971 when the two countries signed a Communications Agreement to establish regular shipping and air links between the Falklands and Argentina. Britain agreed to build a new airstrip and provide regular shipping service, while Argentina agreed to offer regular air service. The Agreement was intended to link the Falklands to the South American regional economy and to allow Falkland residents better health and education services. During the negotiations for possible transfer of sovereignty, the Foreign Office seemed willing to search for mechanisms to cede the Falklands to Argentina.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Aerial_photo_Port_Stanley_edit.jpg>

*Aerial View of Stanley, Capitol of the Falklands –
Would Britain Abandon the Falkland Islands?*

But in December 1976, Argentina had a military coup. The head of state, General Leopoldo Galtieri (1981-1982), had a difficult time forging political coalitions within the military and across other interest groups. The military's abysmal record on human rights and the faltering Argentine economy led to incessant unrest and criticism of the Galtieri government.



Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:Leopoldo-Galtieri.jpg>>

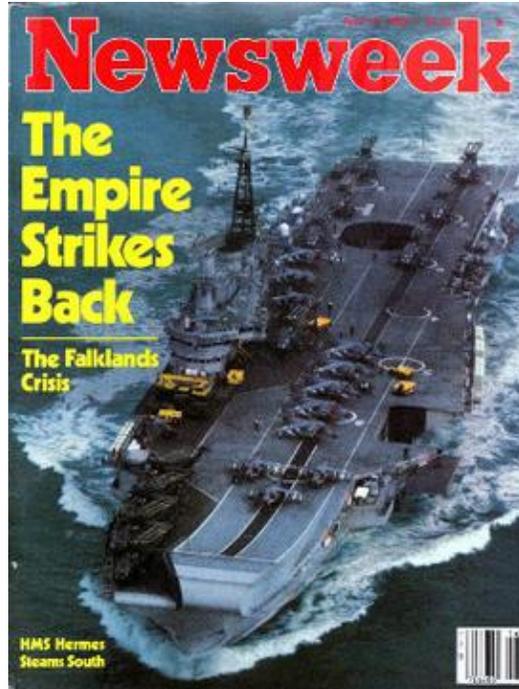
*General Leopoldo Galtieri (1926-2003) –
Military Dictator of Argentina, 1981-1982*

In late 1981, Galtieri planned a desperate gamble to divert attention from those domestic failures. The takeover of the Falklands and of the other British South Atlantic islands, claimed by Argentina, would be an immensely popular action within Argentina. But the Galtieri government held very wrong expectations about foreign reactions to an invasion of the Falklands and South Georgia. Because of the Reagan administration's cordial relations, Galtieri expected that the United States would be supportive or at least remain neutral. In light of

the difficulty for Britain of establishing an 8,000-mile military supply line, Galtieri expected that Margaret Thatcher's government would not strongly resist an Argentine takeover. He was badly mistaken on both counts.

Impacts of the South Atlantic War (1982). General Galtieri's Argentine invasion of the Falkland Islands occurred on April 2, 1982 and of South Georgia on the following day. The South Atlantic War was on. Although British intelligence had detected Argentine military movements, most officials expected that Argentina was bluffing an invasion. In the Falklands, the Argentine forces went ashore on East Falkland directly east of Stanley and quickly took the capital with little loss of life on either side.

In South Georgia, Argentine troops invaded and captured King Edward Point, the seat of British government, with the loss of 15 men. Britain recaptured South Georgia three weeks later on April 25. The Royal Marines easily re-took King Edward Point with no fatalities on either side.



Source: Wikimedia Commons, available at
<https://en.wikipedia.org/wiki/File:The_empire_strikes_back_newsweek.jpg>

*“The Empire Strikes Back” –
Cover of Newsweek Magazine, April 19, 1982*

US Secretary of State Alexander Haig carried out shuttle diplomacy between April 12 and April 30 in an unsuccessful effort to avoid warfare. Britain then began bombing Argentine positions in the Falklands on May 1. The British invasion of East Falkland began on May 21 at Port San Carlos in the northwest of the island. In the following three weeks, British forces worked their way south to Goose Green and east to Stanley. They re-took Stanley on June 14, and the Argentine commander surrendered.



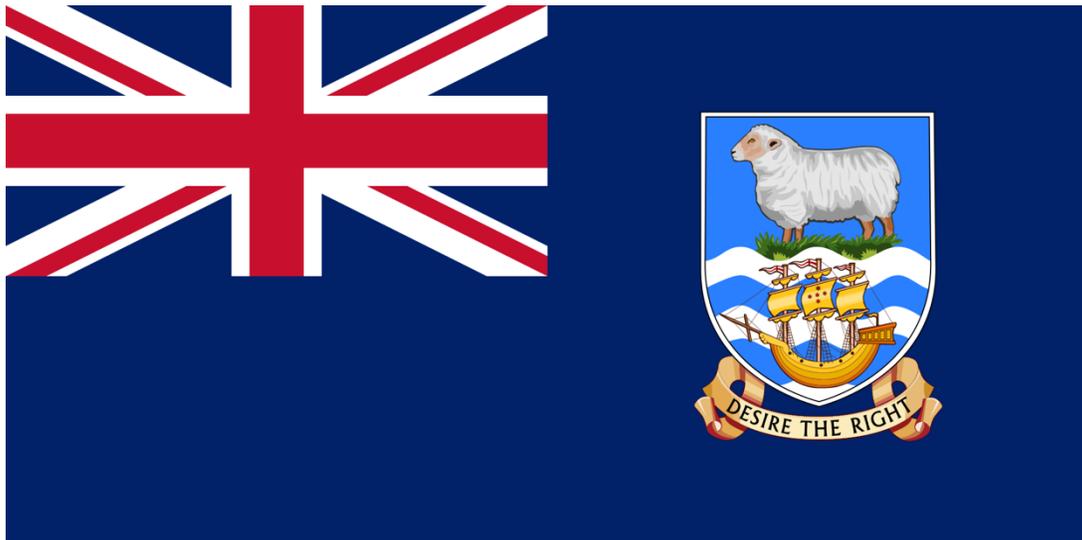
Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Argentine_POWs.jpg>

Repatriation of Argentine Prisoners-of-war – Stanley, June 1982

The war was very costly. The total number of fatalities is still debated, but probably numbered about 1,600 (255 British, the rest Argentine). Military expenditures exceeded \$2 billion. The British even used the cruise ship, *Queen Elizabeth II*, for troop transport. General Galtieri was removed as head of the Argentine government on June 17, three days after having lost the war. Sixteen months later, Argentina was able to elect a democratic government.

Britain moved quickly to rehabilitate the Falklands and provide economic assistance. In late 1982, Lord Shackleton (the son of the

famed explorer) updated his 1976 economic survey of the Falklands and recommended land reform to establish owner-operated farms, enactment of a 200-nautical-mile fisheries zone around the British South Atlantic islands, and significant economic assistance. In December 1982, Francis Pym, the Foreign and Commonwealth Secretary, outlined a development plan for the Falklands that included L15 million for rehabilitation and L31 million over six years for economic assistance. Those funds were made available to the new Falkland Islands Development Corporation. Having largely ignored the Falklands' economic problems for many years before the war, Britain at last was ready to act.



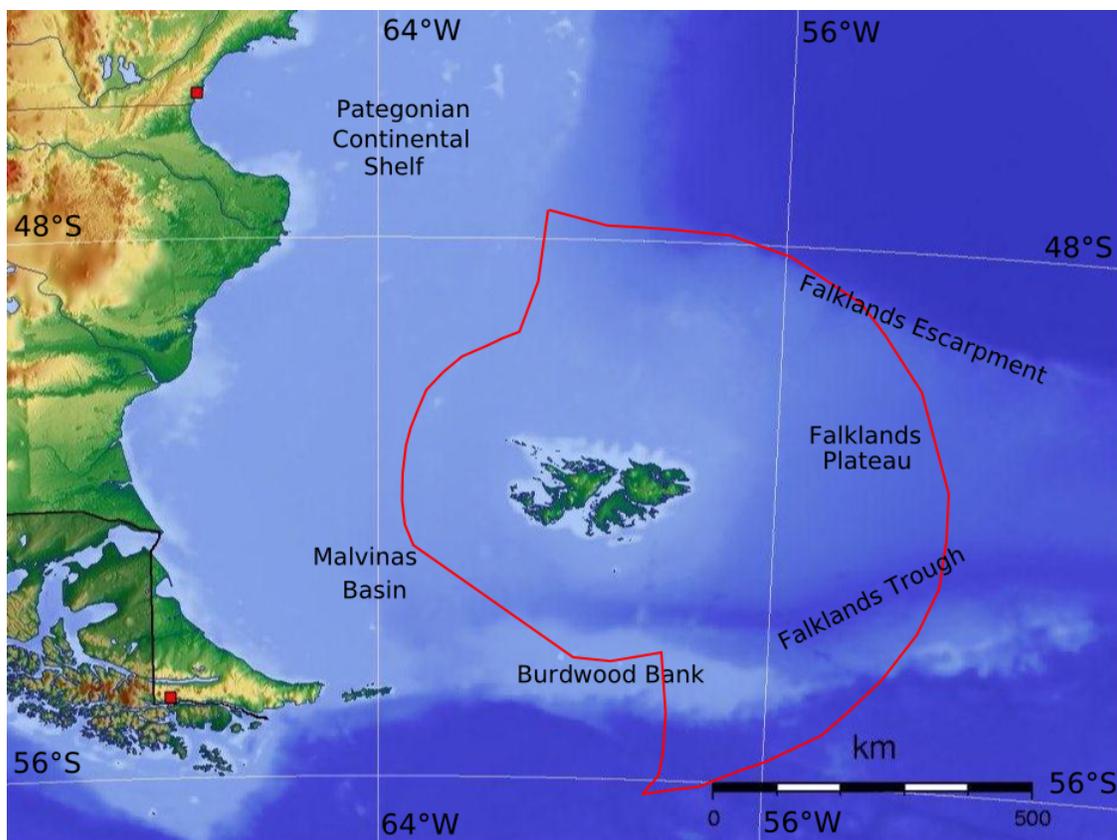
Source: *Wikimedia Commons*, available at https://commons.wikimedia.org/wiki/File:Flag_of_the_Falkland_Islands.svg

“Desire the Right” – Flag of the Falkland Islands

Postwar Developments. Some astute Kelpers (residents of the Falkland Islands) assert that the South Atlantic War was the shock that the Falklands needed to be shaken out of their political and economic doldrums. The Falklands have experienced a regeneration since the war. After stagnating at about 1,800 residents for a century, the non-transient population of the islands increased to 3,200 in the 38 years following the war (four-fifths in Stanley and one-fifth in Camp, the rural areas outside the capital). In 1985, Britain granted the Falklands a new constitution. The islands are now a British Overseas Territory, the governor continues to be appointed from London, the UK remains responsible for defense and foreign affairs, and eight councilors are elected (five from Stanley and three from Camp). There no longer is serious talk of reversion of the Falklands to Argentina that might involve a “leaseback” for the Kelpers to govern themselves.

The revival of the Falklands’ economy has been even more pronounced, even though the wool industry – and thus Falklands’ agriculture – has continued to slump because wool prices have stayed depressed. The \$45 million of British economic assistance has helped.

However, the principal boost to the island economy has come from income from fishing licenses issued to Korean, Japanese, or Spanish fishing ships. About three-fourths of their catch is squid, and much of the remainder is hake and blue whiting. In 1987, the government announced the creation of the Falkland Islands Interim Conservation and Management Zone (FICZ) that sets a 200-nautical-mile limit around the islands for fisheries rights and protection.



Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:FalklandEconomicZone.png>>

The Falkland Islands' Interim Conservation and Management Zone

The Falklands government has earned more than \$40 million annually in license fees and used the income for roads, public health projects, education, agricultural subsidies, and welfare. A secondary economic boost comes from the local expenditures of 1,500 British servicemen who are permanently stationed at the new Mount Pleasant Airport in East Falkland. These troops demand many local services. Tourism has grown gradually as visitors are increasingly attracted by sea mammals, birds, and war memorabilia. About 65,000 visitors arrived in 2019, mostly from cruise ships making short stops. Petroleum was discovered in the Falklands in 2010, and analysts estimate that the Islands might have 1 billion barrels of recoverable oil.



*Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:Port-William.JPG>>*

*Squid Trawler and Cruise Ship in Port William –
Represent the Cornerstones of the Modern Falkland Economy*

South Georgia has also experienced renewed interest in the nearly four decades following the war. Income from fishing licenses, landing fees (from tourist ships), and postage stamps has permitted increased spending on scientific discovery and conservation. Between 1969 and 1982 and since 2001, the British Antarctic Survey has administered the overseas territory of South Georgia and the South Sandwich Islands.

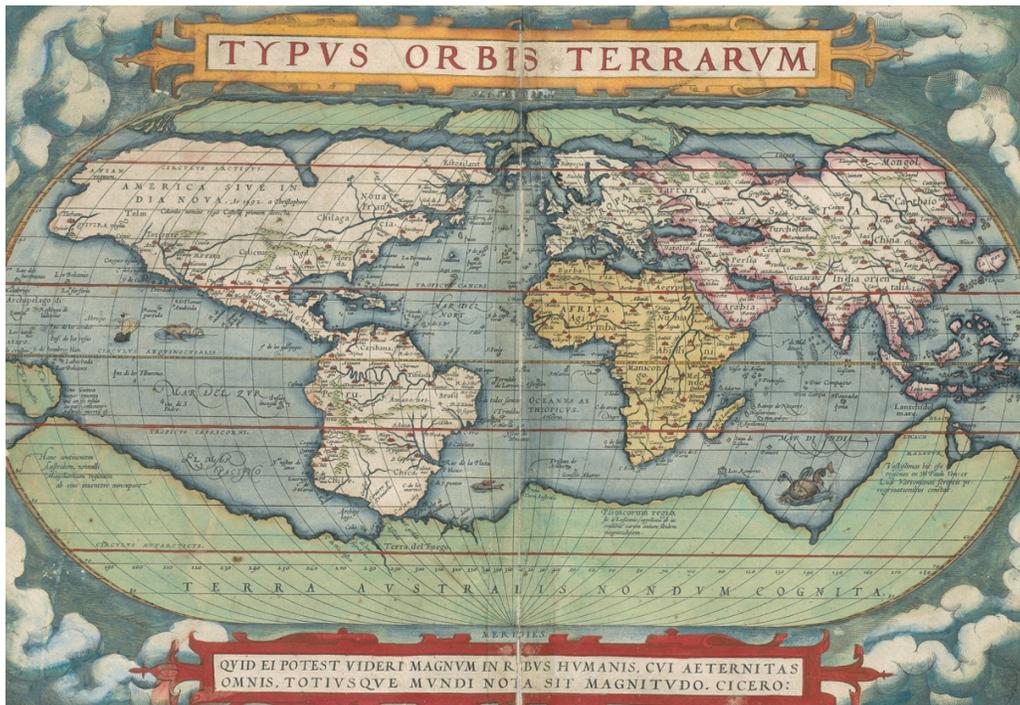


Source: *Wikimedia Commons*, available at
<[https://commons.wikimedia.org/wiki/File:King_Penguins_at_Salisbury_Plain_\(5719368307\).jpg](https://commons.wikimedia.org/wiki/File:King_Penguins_at_Salisbury_Plain_(5719368307).jpg)>

*King Penguins, Reigning in Salisbury Plain, South Georgia –
Primary Tourist Attraction*

The Heroic Age of Antarctic Exploration (1901-1916)

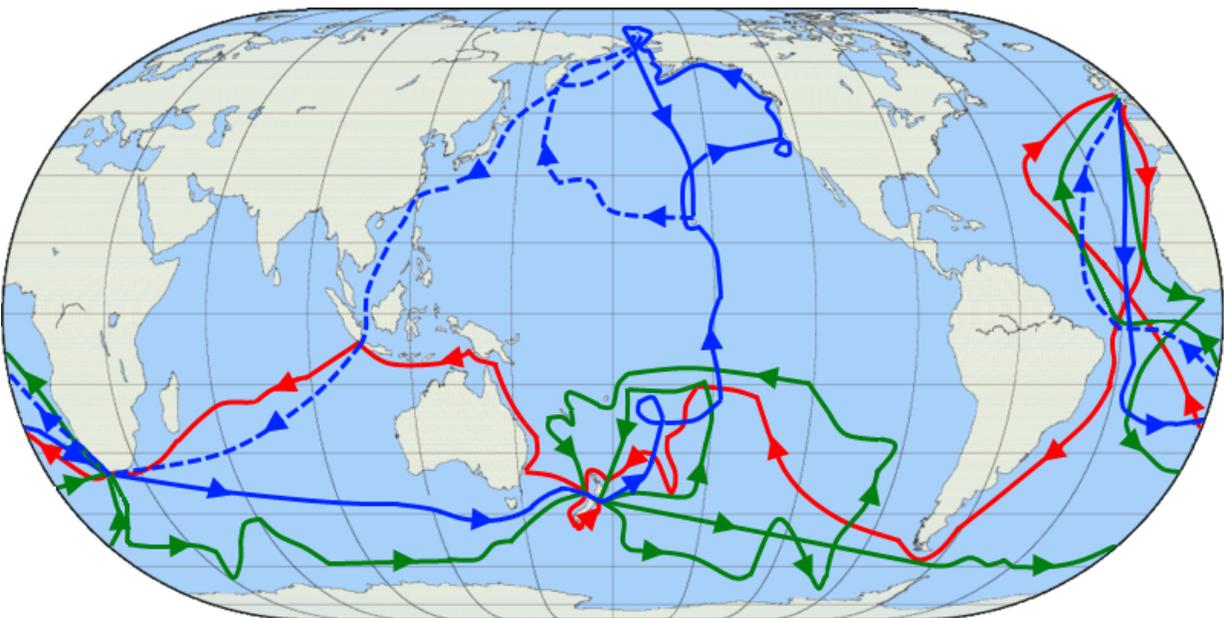
Early Exploration of the Antarctic. In the 4th century BC, Aristotle postulated the existence of an unknown southern continent, *Terra Australis Incognita*, which would balance the weight of the northern continents in a spherical Earth. For more than two millennia, people guessed about the location of *Terra Australis*. In 1498, Vasco da Gama, the Portuguese explorer, sailed around the Cape of Good Hope and proved that the southern continent was not connected to Africa.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Atlas_Ortelius_KB_PPN369376781-001av-001br.jpg>

Carte Ortelius – Map Showing Terra Australis, Antwerp, 1570

In 1578, Francis Drake, the English privateer, was blown into Drake's Passage and showed that *Terra Australis* was not connected to South America. Between 1772 and 1775, Captain James Cook, the English explorer, crossed the Antarctic Circle at three widely dispersed places and showed that a southern continent had to be restricted to the south polar region.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Cook_Three_Voyages_59.png>

Three Circumnavigations of Captain James Cook – First (1768-1771, Red), Second (1772-1775, Green), Third (1776-1779, Blue)

Antarctica was first sighted in 1820, but the first to see the continent is disputed. Thaddeus von Bellingshausen, a Russian

explorer, observed the mainland near the Prime Meridian, and Edward Bransfield, an Irish naval captain, saw it on the Antarctic Peninsula. The first landing on Antarctica is also disputed. John Davis, an American sealer, might have landed at Hughes Bay in 1821. Henryk Bull, a Norwegian businessman, made the first confirmed landing at Cape Adare in 1895. During the first two decades after discovery, several countries sent expeditions to explore the coast of Antarctica. The most significant was a British Antarctic expedition in 1839-1843. Aboard the *Erebus and Terror*, James Clark Ross discovered the Ross Sea, the Victoria Barrier (later renamed the Ross Ice Shelf), and the Admiralty Range. Thereafter, Antarctic exploration waned for half a century.



Source: *Wikimedia Commons*, available at
<https://commons.wikimedia.org/wiki/File:HMS_Erebus_and_Terror_in_the_Antarctic_by_John_Wilson_Carmichael.jpg>

*HMS Erebus and Terror in the Antarctic –
Painting by John Wilson Carmichael, 1847*

The Sixth International Geographic Congress, held in 1895, rekindled interest in Antarctica. Between 1898 and 1917, 14 expeditions from 8 countries sailed to Antarctica. The first was the Belgian Antarctic Expedition (1897-1899). Joseph de Gerlache led the expedition, Frederick Cook (who later claimed to be the first to the North Pole) was the doctor, and Roald Amundsen (who later was the first on the South Pole) was a crewmember. Their ship, the *Belgica*, was

fixed in pack ice for 13 months, and so this expedition was the first to over-winter in Antarctica.



*Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Belgica_dans_la_glace.jpg>*

*The Belgica, Trapped in the Ice in Antarctica, 1898-1899 –
Painting by Adrien de Gerlache, 1902*

The British Antarctic Expedition followed. Carsten Borchgrevink, a Norwegian emigrant to Australia, led the land party of 10 men who, in 1899-1900, were the first to over-winter on land in Antarctica. The Swedish Antarctic Expedition (1901-1904), led by Otto Nordenskjöld, suffered a near disaster when their ship, the *Antarctic*, sunk in early

1903. But the crew escaped to Paulet Island for later rescue. The heroic age of Antarctic exploration had begun.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Medlemmar_ur_Otto_Nordenskj%C3%B6lds_expedition_till_sydpolen.jpg>

*The Swedish Antarctic Expedition (1901-1904) –
Otto Nordenskjöld and His Officers, Aboard the Antarctica, 1901*

Scott's Discovery Expedition (1901-1904). In 1898-1899, Sir Clements Markham, the influential head of Britain's Royal Geographic Society, raised L90,000 (half private donations, half from government) to fund the British National Antarctic Expedition. L50,000 was spent on the *Discovery*, the first British vessel constructed for scientific

exploration. The goals of the expedition were to advance exploration and science, including meteorology, geology, oceanography, biology, and magnetism. Sir Clements selected Robert Falcon Scott, a 32-year-old British naval officer, to lead the expedition.



Source: Wikimedia Commons, available at
<[https://commons.wikimedia.org/wiki/File:Scott_of_the_Antarctic_\(bw\).jpg](https://commons.wikimedia.org/wiki/File:Scott_of_the_Antarctic_(bw).jpg)>

Robert Falcon Scott (1868-1912) – Pictured in 1905

The *Discovery* sailed from England in August 1901 and reached Antarctica in January 1902. While sailing along the Ross Ice Shelf, Scott and his party discovered King Edward VII Land. In February, Scott allowed the *Discovery* to become frozen in pack ice for the

Antarctic winter on McMurdo Sound and built a hut at Hut Point on Ross Island. The team then began its winter preparation for the first-ever attempt to reach the South Pole and its program of scientific research via sledging teams. The try for the Pole began in early November and lasted for three months.

The polar team consisted of only three men. Scott, the leader, was highly disciplined, but his interests ran more to science than to the logistics of polar exploration. Scott and his team made only a half-hearted attempt to train dog teams to pull their sledges. Edward (“Bill”) Wilson, a medical doctor and zoologist, was Scott’s highly able alter ego. Wilson was a well-respected colleague and team player. Ernest Shackleton, at 26, was the youngest member of the polar team and a sub-lieutenant in the British navy. Shackleton clashed openly with Scott, and Wilson had to mediate their disputes.



Source: *Wikimedia Commons*, available at
<https://commons.wikimedia.org/wiki/File:ATLNZ_11714.jpeg>

Ernest Shackleton (Left), Robert Falcon Scott (Center), and Edward (“Bill”) Wilson (Right) – Before Marching South in November 1902

On December 30, 1902, the three men reached a new “furthest south” of 82 degrees, 16’ South latitude. But they were forced to turn back because their dog teams were ineffective and their food supplies ran short. Shackleton contracted a bad case of scurvy and had to be carried by sledge on part of the return trip. Scott later sent him back to England to recuperate. The *Discovery* was fixed in the pack ice for a second winter in 1903. Sledging parties undertook an important

program of scientific investigations in the region. Scott led the most ambitious sledging trip, a dangerous two-month journey up the Ferrar Glacier to the polar icecap. The *Discovery* broke out of the ice in February 1904. After he returned home, Scott received acclaim and rapid naval promotions. The race for the South Pole was on.



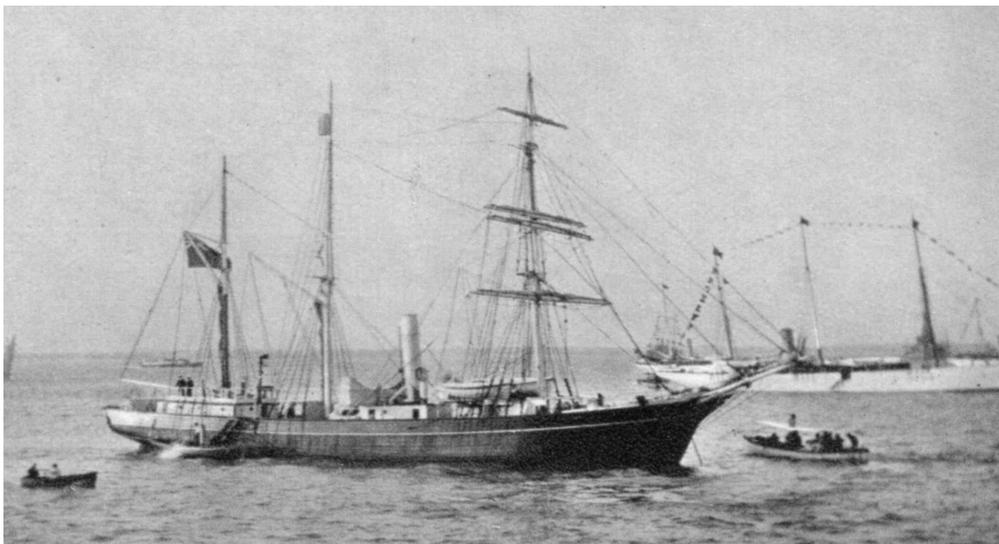
*Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Scott_hut_mcmurdo.jpg>*

*Hut from Scott's Discovery Expedition, Hut Point, Ross Island,
McMurdo Sound – With US McMurdo Base in Background*

Shackleton's *Nimrod* Expedition (1907-1909). Ernest

Shackleton wanted desperately to lead the first successful expedition to the geographic South Pole. As he sought funding for his expedition,

Shackleton portrayed his planned expedition as exploration and scientific research. His benefactor, William Beardmore, a Scottish industrialist, underwrote part of the trip's costs, and Shackleton borrowed the remainder against the promise of future lecture fees. With his limited budget, Shackleton had to settle for the *Nimrod*, a 40-year-old sealer with Antarctic experience but decaying masts.

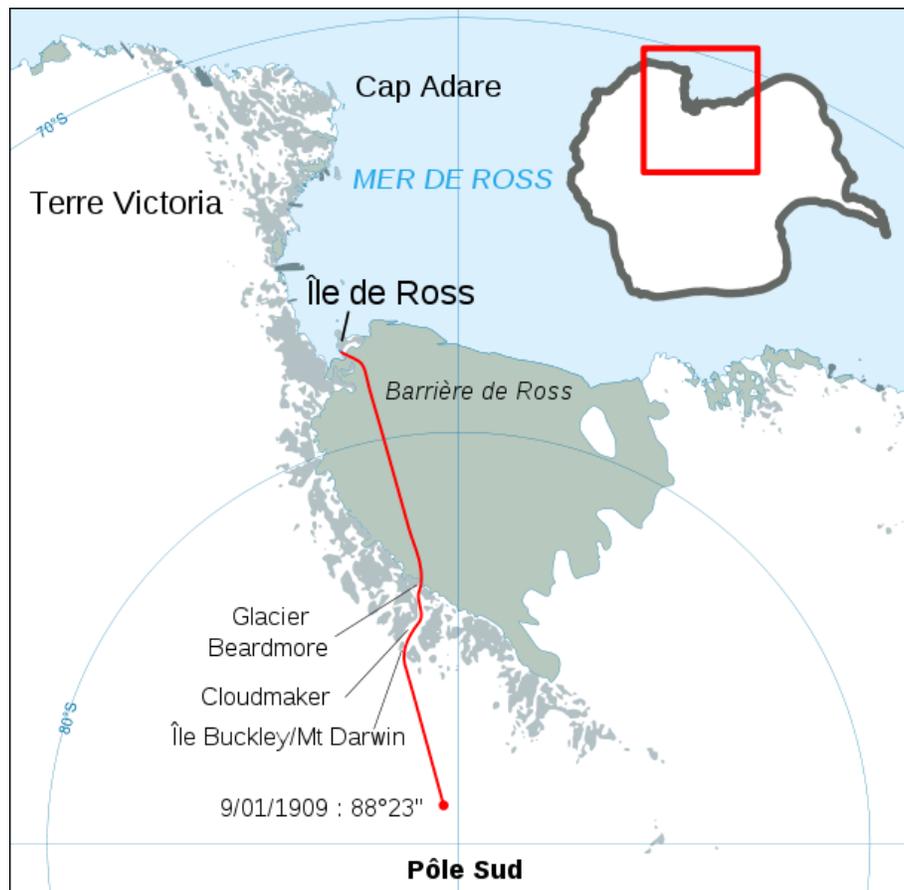


Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:NimrodDepartingToSouthPole1907.jpg>>

The Nimrod – Departing for Shackleton's South Pole Expedition. 1907

Shackleton had promised Scott that he would not use McMurdo Sound as his base of operations. But Shackleton was forced to set up at Cape Royds, on Ross Island slightly north of Scott's former base at Hut Point, after three alternatives were not accessible due to pack ice. Scott

was furious and never forgave Shackleton. During the Antarctic winter of 1908, Shackleton and his 15 men prepared for the assault on the geographic pole. The polar party consisted of four men – Shackleton, Frank Wild, Eric Marshall, and Jameson Adams.



Source: Wikimedia Commons, available at [https://commons.wikimedia.org/wiki/File:Antarctic_expedition_map_\(Nimrod\)-fr.svg](https://commons.wikimedia.org/wiki/File:Antarctic_expedition_map_(Nimrod)-fr.svg)

Route of Shackleton, Wild, Marshall, and Jameson, to 88 Degrees South – 1908-1909

Shackleton's leadership skills helped the group to overcome extreme pain, snowblindness, exhaustion, and the constant fear of

starvation on their 128-day journey (from October 29, 1908 to March 5, 1909). They discovered and named the Beardmore Glacier and made a 10,200-foot climb to reach the polar plateau. On January 9, 1909, the four exhausted and hungry men reached 88 degrees, 23' South latitude, only 112 miles (97 nautical miles) from the pole. But Shackleton made the excruciating decision to turn back. He wrote to his wife, Emily: “A live donkey is better than a dead lion.” The party then made a miraculous return to the *Nimrod* and safety. They had walked 1,700 miles and man-hauled their sledges most of the way.



Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:TheSouthernParty.jpg>>

*Wild, Shackleton, Marshall, and Adams –
Aboard the Nimrod, After Their 1700-mile Trek*

Shackleton had rejected the sage advice of famed Norwegian explorer, Fridtjof Nansen, and opted to use ponies instead of dogs to pull the sledges. The ponies were nearly useless. While the polar party was away, their twelve colleagues made significant accomplishments. Edgeworth David, Alistair Mackay, and Douglas Mawson were the first to reach the South Magnetic Pole, and Mawson and others climbed Mount Erebus, the first ascent of a mountain in Antarctica. For setting a new “furthest south” 360 miles closer to the pole, Shackleton was lionized upon his return home. His reception was the warmest accorded to any explorer since Nansen had returned to Norway in 1896.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Ernest_Shackleton.jpg>

Ernest “The Boss” Shackleton, 1909 – Age 35

Amundsen's *Fram* Expedition (1910-1912). Roald Amundsen, the Norwegian polar explorer, was a student of polar exploration, a meticulous planner and logistician, and an effective leader of small groups of men. When Amundsen was 28, he was among the first to live through the Antarctic winter aboard the frozen-in *Belgica* (1898-1899). At age 35, Amundsen was the first to sail through the Northwest Passage in Arctic Canada aboard the *Gjoa* (1903-1906).



Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:Gjoea.jpg>>

*The Gjoa –
Used by Roald Amundsen To Sail the Northwest Passage, 1903-1906*

When he returned to Norway, he asked Fridtjof Nansen for permission to use the *Fram*, the finest wooden ship ever built to withstand polar ice. Amundsen wanted to be the first man on the North Pole. He planned to replicate Nansen's earlier effort and place the *Fram* in the Arctic pack ice, hoping the ship would drift across the North Pole or come close enough so that Amundsen could make a dash for the pole with skis and dog sledges. But in 1909, Robert Peary's claim to have reached the North Pole was widely accepted (although many today dispute it).



Source: Wikimedia Commons, available at
<https://en.wikipedia.org/wiki/File:The_Fram_Under_Sail.jpg>

The Fram – Under Sail in Antarctica, 1911

Amundsen secretly decided to use the *Fram* to try for the South Pole. Because Norwegian independence, won in 1905, depended on British support, he feared that his government would quash his attempt to compete with Scott. Under the guise of sailing around Cape Horn to the Alaskan Arctic, Amundsen cabled Scott his true intentions after leaving Madeira.



Source: *Wikimedia Commons*, available at
<https://commons.wikimedia.org/wiki/File:Amundsen_in_fur_skins.jpg>

Roald Amundsen (1872-1928) – Pictured in 1923

Amundsen's run for the South Pole has been compared with a Viking raid. It was meticulously planned and efficiently executed. He chose as his base the Bay of Whales, which was 60 miles (9 percent) closer to the pole than Scott's base in McMurdo Sound. Amundsen and his team of eighteen men set up three supply depots – at 80, 81, and 82 degrees South – and deposited 1.5 tons of supplies in them.

Amundsen selected a balanced team of specialists for his polar assault force. Helmer Hanssen and Sverre Hassel were experts with North Greenland dogs and Nansen sledges, Olav Bjaaland was a ski champion, and Oscar Wisting was a whale harpooner with enormous strength. The five men used four sledges each pulled initially by thirteen well-trained dogs. During the 96 days of the return trip, the polar party averaged 23 miles/day as they skied alongside the dog-pulled sledges. Amundsen established a daily routine – five hours of skiing/sledging, 1.5 hours of building a snow cairn, and rest for the remainder.



Source: Wikimedia Commons, available at
<[https://en.wikipedia.org/wiki/File:Polar_transport_\(Amundsen\).jpg](https://en.wikipedia.org/wiki/File:Polar_transport_(Amundsen).jpg)>

Dog-sledging – The Key to Amundsen’s Success

The party reached the South Pole on December 14, 1911, erected a tent that they called Poleheim, raised the Norwegian flag, and left messages for Scott and King Haakon of Norway. On January 25, 1912, they arrived back at the *Fram*, and on March 7 Amundsen cabled his brother from Hobart, Tasmania to announce the victory. All went according to plan.



Source: Wikimedia Commons, available at [https://commons.wikimedia.org/wiki/File:Antarctic_expedition_map_\(Amundsen_-_Scott\)-en-crop.png](https://commons.wikimedia.org/wiki/File:Antarctic_expedition_map_(Amundsen_-_Scott)-en-crop.png)

Roald Amundsen's Route to the South Pole (Red, Reached 12/14/1911) and Robert Falcon Scott's Route to the South Pole (Blue, Reached 1/17/1912)

Scott's Terra Nova Expedition (1910-1912). Robert Scott was thirsting for another try at the South Pole. He was having difficulty

raising funds for the expedition on the lecture circuit, but the British Government contributed L20,000 in 1910. Since the *Discovery* was not available, Scott settled for the *Terra Nova*, a coal-burning whaler built in 1884. He planned to return to Hut Point on McMurdo Sound, but in January 1911 the pack ice forced Scott and his fifteen men to set up their base a few miles north at Cape Evans. In February, Scott led an advance party to establish One Ton Depot. The plan was to site it at 80 degrees South, but poor weather forced the men to locate the depot 30 miles north of the planned site.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Terra_nova_hut_inside.jpg>

Inside the Terra Nova Hut at Cape Evans – Pictured in 2000

Scott began his trek to the South Pole in late October, the Antarctic Spring. His Achilles heel was an inability to settle on one means of transport for the expedition. The 16 men began the journey to the pole with two motorized sledges, 10 Siberian ponies, 233 dogs, and 13 sledges. The motorized sledges soon stopped working. Ponies were ineffective in Antarctica because they were heavy and all of their food had to be imported. The British team doubted the efficacy of using dogs, and they did not bother to tame and train their dogs properly. By mid-December, Scott had abandoned the motor sledges, shot the ponies, and sent the dogs back to camp. Thereafter, they relied wholly on man-hauling their sledges, a slow, difficult, and exhausting means of transportation.

Five men – Scott, “Bill” Wilson, “Titus” Oates, Edgar Evans, and “Birdie” Bowers – made the trip to the pole. There was no specialization of tasks. When the British team reached the South Pole on January 17, 1912, they felt anguish rather than triumph. The Norwegians, who had been there 33 days earlier, had erected a tent,

raised a Norwegian flag, and left a letter for Scott. Scott wailed: “Great God! This is an awful place.”



Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:Scottgroup.jpg>>

Wilson, Bowers, Evans, Scott, and Oates, at the South Pole, January 17, 1912 – Anguish, not Triumph

The weather on the return trip was unusually cold and stormy. All five men met tragic deaths. Evans died on February 18, Oates on March 17, and the three others about March 31 at a point 11 miles south of One Ton Depot where ample supplies of food and fuel awaited them.

Amundsen's team won the race to the pole because they skied, used well-trained dog teams to pull their sledges, and wore Eskimo-like clothing. In contrast, Scott's team trudged and skied, reverted to man-hauling their sledges, and wore rubberized clothes. Controversy exists over why the British explorers perished. Their tragic deaths likely were due more to cruel weather than to inadequate leadership or planning.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Cross_on_Observation_Hill_-_Scott_memorial.jpg>

*Memorial Cross on Observation Hill, Overlooking Hut Point –
Erected January 1913*

Shackleton's *Endurance* Expedition (1914-1916). To raise funds for another Antarctic expedition, Ernest Shackleton coined a catchy slogan – “the first crossing of the last continent.” On the Imperial

Trans-Antarctic Expedition, Shackleton and five other men would trek across Antarctica from the Weddell Sea via the South Pole to the Ross Sea. With ample funds, Shackleton had a superb new ship, the *Endurance*, built in Norway. The *Endurance* was the second strongest ship (after the *Fram*) ever built. Her solid oak keel was over seven feet thick. The *Endurance* sailed from England in August 1914.

Shackleton's team convened in Buenos Aires and then sailed on to South Georgia in late October.



Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:Shack-endurance.jpg>>

Ernest (“The Boss”) Shackleton – Aboard the Endurance, 1914

Shackleton's party spent more than a month in South Georgia and learned from the Norwegian whalers that the Antarctic Spring weather that year was the worst in memory. In early December, the *Endurance* left South Georgia and sailed into the Weddell Sea, bound for Vahsel Bay. She never landed in Antarctica. The *Endurance* was locked in ice on January 19, 1915 and began a northwesterly drift of 570 miles over nine months. The strong, new ship was crushed in the ice on October 27 and the men took all provisions they could access, abandoned her, and moved into tents on ice floes with three lifeboats. The *Endurance* sank on November 21.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Endurance_Final_Sinking.jpg>

The Endurance, Locked in Ice – Shortly Before It Sank, November 1915

Shackleton's party lived on ice floes for more than five months, supplementing their food rations with seals and penguins. Through the Antarctic summer, the ice floes diminished in size. In March 1916, the 28 men had drifted within 60 miles of Paulet Island where they knew a food cache had been stored 12 years earlier by the ship that rescued the crew of the *Antarctic*. But decaying ice prevented access to Paulet, and they continued to drift to the northwest.



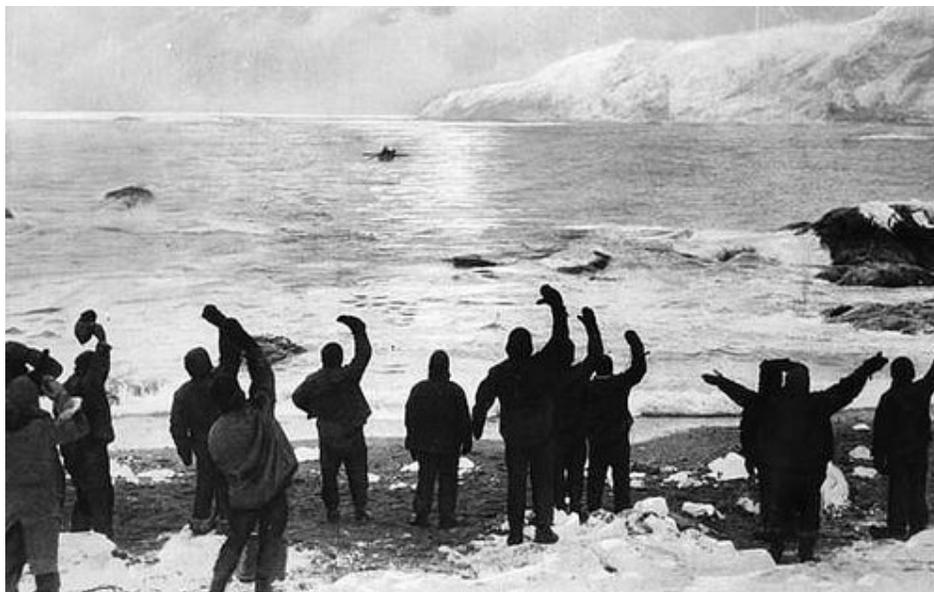
Source: *Wikimedia Commons*, available at
<https://commons.wikimedia.org/wiki/File:Hurley_and_Shackleton,_Antarctic_Ice_Flow,_1914-1915_State_Library_NSW_a423023h.jpg>

*Frank Hurley (Skinning a Penguin) and Ernest Shackleton –
Patience Camp, Ice Floe, March 1916*

When their ice floe disintegrated on April 9, they launched the three 22-foot-long boats – *James Caird*, *Dudley Docker*, and *Stancomb Wills* – all named for trip benefactors. Strong currents and gale-force winds made progress dangerous and unpredictable. Shackleton was forced to change the party’s destination four times – from Elephant Island to Snow Island to King George Island to Hope Bay and back to

Elephant Island. After five days at sea, they reached Elephant Island on April 14.

No one had ever landed on that island, and no one was likely to find them there. Shackleton decided to sail and row to South Georgia with five other men in the *Caird* and leave the remaining 22 men on Elephant Island for later rescue. The castaways built a hut from the two remaining boats and settled in to withstand another Antarctic winter.



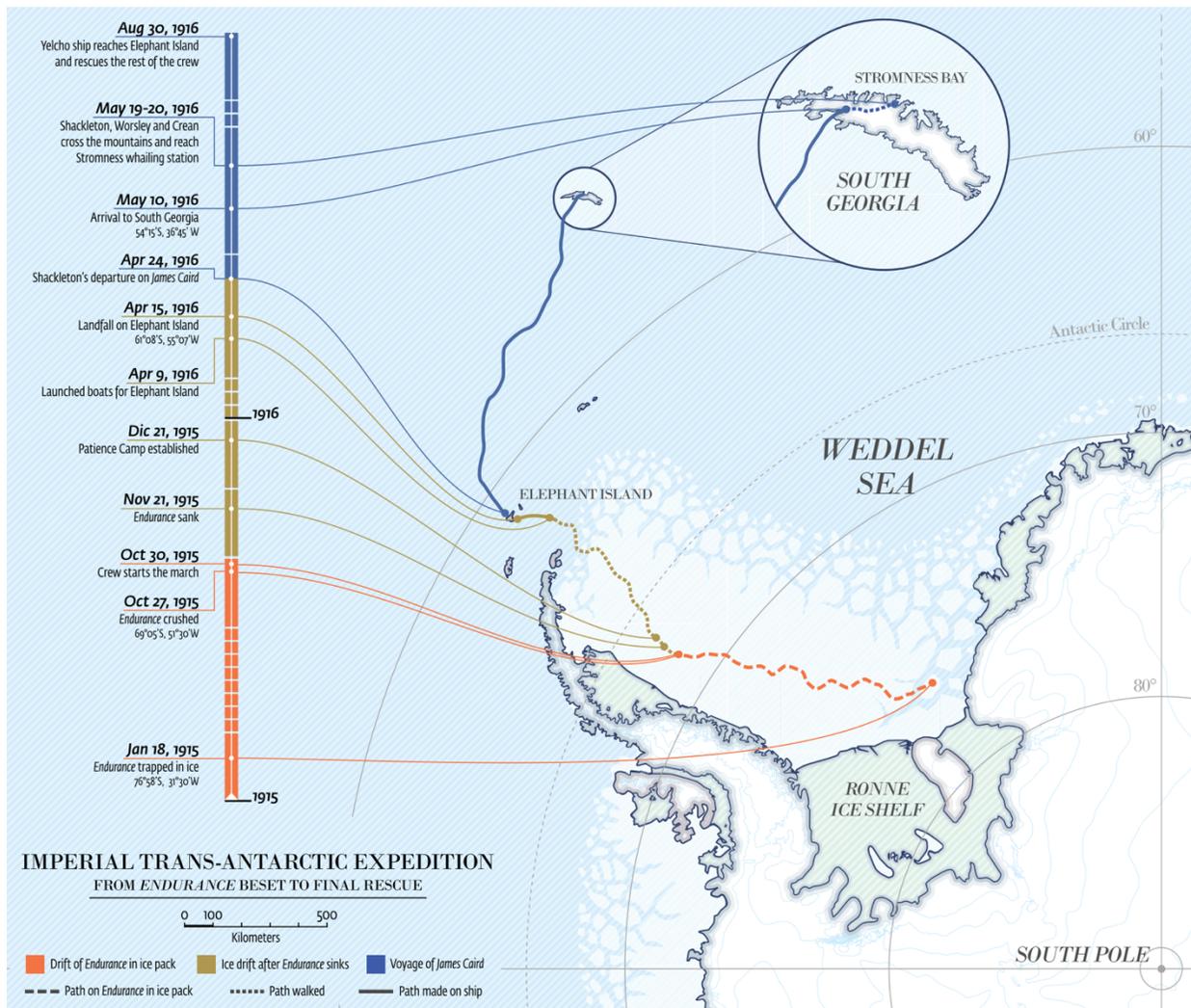
Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:AllSafeAllWell.jpg>>

*Departure of the James Caird from Elephant Island, April 24, 1916 –
Shackleton and Five Men Hoped To Reach South Georgia*

The End of the Heroic Age of Antarctic Exploration (1916).

Ernest Shackleton, Frank Worsley, Tom Crean, and three other men

spent 16 horrific days crossing the 800 miles from Elephant Island to South Georgia. In their 22-foot boat, laden with two tons of ballast, they braved 50-foot waves, gales, and blizzards in the Drake Passage.



Source: *Wikimedia Commons*, available at
https://commons.wikimedia.org/wiki/File:Imperial_Trans-Antarctic_Expedition_map_and_timeline.svg

*Routes of the James Caird to South Georgia
 and of Shackleton's Party Across South Georgia*

Shackleton and his five colleagues knew that they could not sail north to Cape Horn or the Falklands because of the strong westerly current and winds. If they missed South Georgia, there would be no turning back into the teeth of the westerlies. Fortunately, Worsley was a brilliant navigator and handler of small boats. His skill, Shackleton's leadership, and good fortune brought them to the west coast of South Georgia on May 10, 1916. After negotiating difficult reefs in miserable weather, they landed at King Haakon Bay. But they lost their rudder and could not sail further.



Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:PanoramaOfSouthGeorgia.jpg>>

The Interior of South Georgia – Photograph by Frank Hurley, May 1916

All of the Norwegian whaling stations were on the eastern side of South Georgia. The nearest, Stromness, was 17 miles away over land. Because South Georgia is covered with steep mountains, icy slopes, and glaciers with dangerous crevasses, no one had ever ventured more than a mile from the coast. On May 19, Shackleton, Worsley, and Crean began a 24-hour, non-stop climb across South Georgia with no map. They rejoiced when they heard the sound of the whaling station's signal that called men to work the next morning. The Norwegian whalers were shocked at the sight of the three filthy, tattered men.

The next day, Worsley took a whaling boat around the island to pick up the three men at King Haakon Bay. On May 23, Shackleton and Worsley sailed toward Elephant Island on the Norwegian whaler, *Southern Sky*. Within 60 miles of their destination, the winter pack ice forced them to retreat to the Falklands. Later the Uruguayan Government lent Shackleton the trawler, *Instituto de Pesca No. 1*, and again the pack ice prevented access to Elephant Island. Shackleton next chartered the *Emma* in Punta Arenas, but that old schooner lost an engine within 100 miles of the destination. The Chilean Government

then lent the persistent Shackleton a steamer, the *Yelcho*, and he was finally able to rescue his 22 men from Elephant Island on August 30, 1916. They had been castaways for more than four months.



Source: *Wikimedia Commons*, available at
<[https://commons.wikimedia.org/wiki/File:Elephant_island_party_\(cropped\).jpg](https://commons.wikimedia.org/wiki/File:Elephant_island_party_(cropped).jpg)>

*The Twenty-two Men Rescued On Elephant Island, August 30, 1916 –
Photograph by Frank Hurley*

Shackleton thus preserved his record of never having lost a man in Antarctic exploration. His dramatic rescue brought the heroic age of Antarctic exploration to a close, less than two decades after it had begun. Forty years later, in 1956, Raymond Priestley, a geologist and Antarctic

veteran, was asked to contrast the merits of the three leading explorers in the heroic age. To lead a scientific expedition, he chose Robert Scott, to run a race to the South Pole, he selected Roald Amundsen, and to effect an escape in life-threatening adversity, he named Ernest Shackleton.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Shackleton_Endurance_Aurora_map2.png>

Ernest Shackleton's Endurance Expedition (1914-1916) – Endurance (Red), Endurance Drift in Pack Ice (White), Drift in Sea Ice (Dark Green), James Caird (Blue), Planned Antarctica Crossing (Light Green)

Who Owns Antarctica?

National Claims (1908-1958). Russia (Thaddeus von Bellinghausen), Britain (Edward Bransfield), and the United States (Nathaniel Palmer) all allege to have first discovered Antarctica about 1820. But no country officially claimed possession of any of Antarctica until 1908.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Emperor_Penguin_Manchot_empereur.jpg>

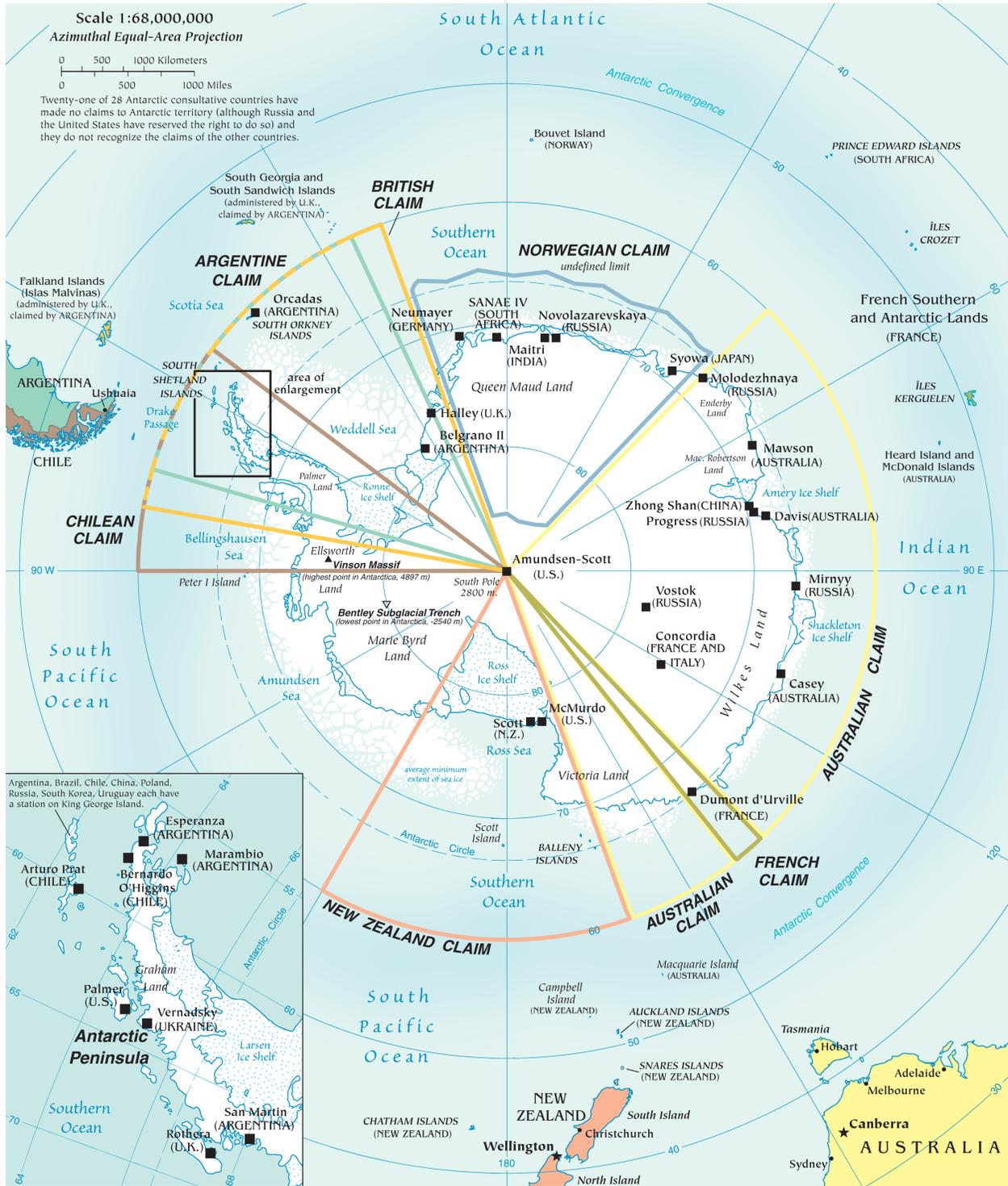
Who Will Be the Emperor of Antarctica?

In that year, Britain extended its claim on the Falkland Island Dependencies (FID) southward to the South Pole, using the sector concept of pie-shaped wedges. Britain's goal was the gradual imperial

conquest of the southern continent. Britain then claimed the Ross Dependency on behalf of New Zealand in 1923 and backed Australia's claim to the Australian Antarctic Territory a decade later. Two-thirds of Antarctica thus was claimed for the British Empire.

When France asserted its right to Adélie Land in 1924 and Norway claimed Queen Maud Land in 1939 (to preempt Nazi Germany), Britain recognized those claims. But Chile (in 1940) and Argentina (in 1943) made claims to pie-shaped sectors that overlapped Britain's FID Antarctic territory. The Chilean Antarctic Territory and Antartida Argentina were also in conflict.

In 1946, the US Navy deployed 4,700 men to take 70,000 photographs of Antarctica's coast. During the Cold War, the US and the USSR chose to cooperate to prevent conflict in Antarctica. Both superpowers made no claims on Antarctic territory, but reserved their rights to make future claims. Both powers hoped that scientific cooperation would ensure peace in Antarctica.



Source: Wikimedia Commons, available at
https://commons.wikimedia.org/wiki/File:Antarctic_Region.png

National Claims To Antarctica's Territory – Argentina, Australia, Chile, France, New Zealand, Norway, and United Kingdom

The US and the USSR, together with the seven claimant countries plus Japan, Belgium, and South Africa, embarked on the International Geophysical Year (IGY, 1957-1958). They froze the sovereignty issue and built 40 research stations on the Antarctic continent and 20 more on sub-Antarctic islands to study glaciology, meteorology, and geomagnetism.



Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Base_Brown_Argentina_Puerto_Paraiso.jpg>

Argentinian Almirante Brown Station – Paradise Harbor, Antarctica

The Antarctic Treaty (1959). In 1959, the US Government invited the twelve IGY nations to Washington to prepare an Antarctic Treaty. The Treaty was agreed in December 1959 and ratified in June

1961. The Treaty's key provision is Article IV, which suspends national claims to Antarctic territory. The seven claimant nations agree to neutralize, not rescind, their rights in Antarctica, and all signatory parties promise not to make new claims. Within a framework of international sovereignty, the claimants permit other countries to construct research stations in their territories. Political stability for Antarctica, a central goal, was promoted in two lead articles of the Treaty. Article I calls for Antarctica to be a zone of peace and prohibits military bases, maneuvers, and testing. Military personnel in Antarctica are to engage only in peaceful scientific pursuits. Article V bans the testing of nuclear explosive devices and the disposal of radioactive waste materials in Antarctica.



Source: United States Antarctic Program, available at
<<https://photolibary.usap.gov/PhotoDetails.aspx?filename=CHALETFLAGS.JPG>>

*Flags of the Twelve Signatory States To the Antarctic Treaty –
US National Science Foundation Chalet, McMurdo Station*

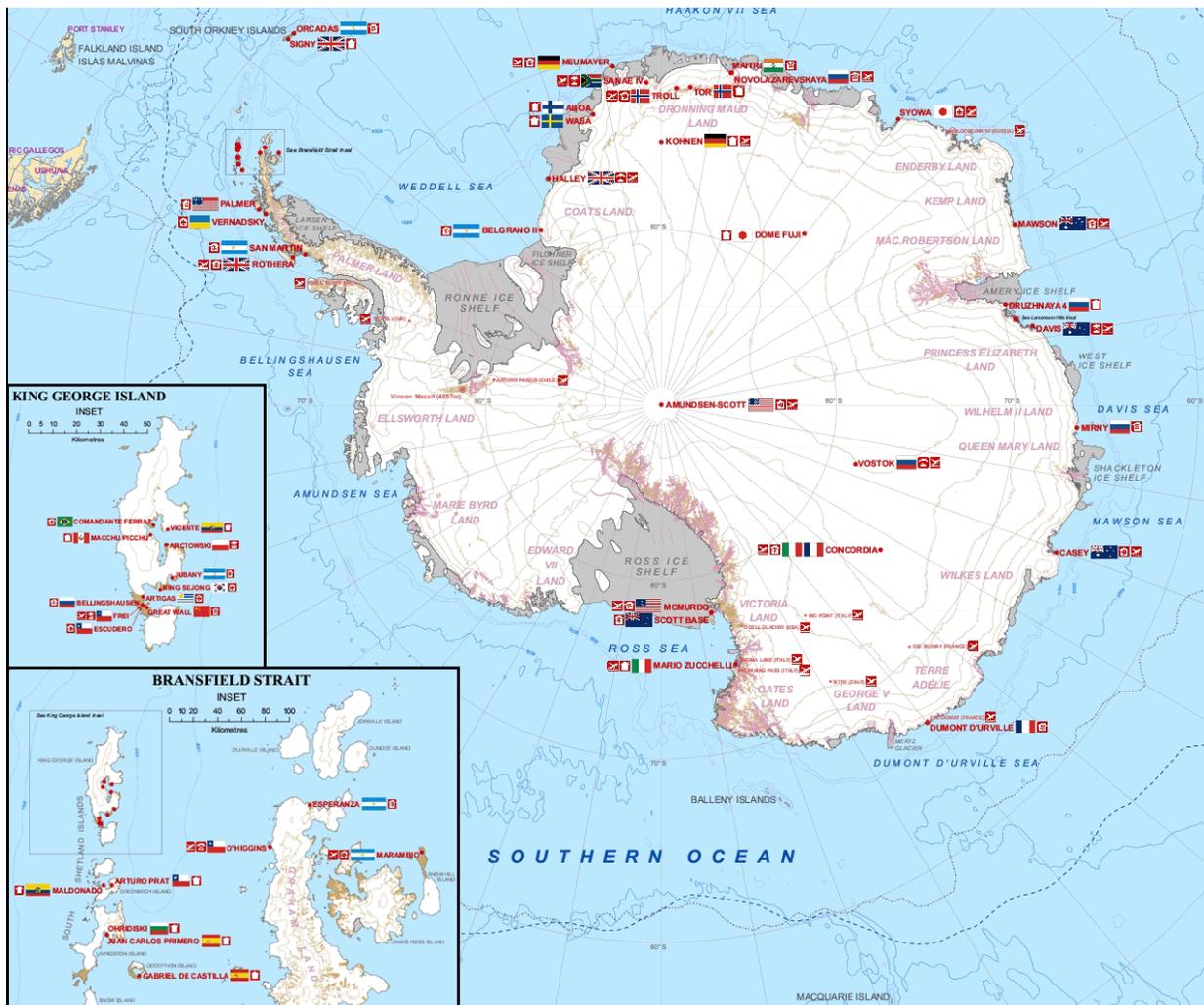
Another principal purpose of the Treaty is to promote scientific research. In Article III, signatory nations agree to cooperate in planning scientific research, exchange scientists, and share scientific results.

Article VII permits the inspection by any treaty state of all research stations and equipment in Antarctica. The results of research in earth sciences, glaciology, atmospheric and marine sciences, and climatology have become Antarctica's leading export. The 28 Consultative Parties to the Antarctic Treaty – 12 IGY participants plus 16 acceding countries

that engage in substantial scientific research – govern by consensus.

The recommendations from annual meetings are ratified by all

Consultative Parties. The multilateral governance of Antarctica limits policy options to regulations rather than taxes/subsidies.



Source: Wikimedia Commons, available at https://commons.wikimedia.org/wiki/File:Antarctica_Station_Map.png

Locations of Antarctica's Scientific Research Stations

Commercial Uses of Antarctica. The exploitation of living marine resources is partially regulated under the Antarctic Treaty System (ATS). The harvesting of krill, shrimp-like organisms, has been regulated in the ATS since 1982. Regulation and lack of market have reduced krill catches to a fourth of their 1980s levels and ended over-harvesting.



Source: Wikimedia Commons, available at
<[https://commons.wikimedia.org/wiki/File:Antarctic_krill_\(Euphausia_superba\).jpg](https://commons.wikimedia.org/wiki/File:Antarctic_krill_(Euphausia_superba).jpg)>

Krill (Euphausia superba) – Key Protein Source for Marine Mammals

The Southern Ocean is not rich in fish resources. Cod and crab are caught. The major problem lies with the illegal harvesting of Patagonian toothfish (Chilean sea bass) despite ATS regulations. Whaling is

regulated by the International Whaling Commission (formed in 1946). Japan insists on killing minke whales, allegedly for research purposes. A recent compromise could limit that catch to 150 minke per year.

The number of commercial tourist visits to Antarctica grew to 56,000 in 2018-2019, one-third from the US. Most tourism is by ship to the Antarctic Peninsula. The International Association of Antarctic Tour Operators (IAATO), made up of more than 100 companies from 16 countries, self-regulates tourism in Antarctica. Each operator files Environmental Impact Assessments (EIAs), briefs tourists on regulations, and controls land visits. If the growth of tourism intensifies, the IAATO might need to introduce a new Tourist Convention to limit growth and impact.



*Source: Wikimedia Commons, available at
<<https://commons.wikimedia.org/wiki/File:Deception-Tourists.jpg>>*

*Tourists Enjoying Volcanically-heated Water –
Hot Spring, Port Foster, Deception Island*

Pharmaceutical firms engage in bioprospecting in Antarctica – research that leads to patents on genetic and biochemical resources that guarantee property rights on Antarctica flora and fauna. In 2007, there were 40 such patents worldwide and 90 more pending in the US. The ATS does not regulate bioprospecting. Such regulation is difficult because much research is done in consortia between scientific and commercial groups and multinational companies are inherently difficult to regulate.



*Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:Emblem_of_the_Antarctic_Treaty.svg>*

Emblem and Flag of the Antarctic Treaty – Since 2002

Interaction of Global Natural Processes. Antarctica is at the heart of a global environmental system, encompassing the atmosphere, oceans, glacial ice sheets, and biota. The interactions of these natural processes influence global climate. The Antarctic ice sheet contains 90 percent of the world's glacial ice and 70 percent of the world's fresh water. Surface temperatures in Antarctica have risen five degrees Fahrenheit, ten times the global average, during the past 50 years. Antarctica is the world's only remaining continental wilderness. Hence, there has been growing political pressure for Antarctica to be treated as a global commons.



Source: Wikimedia Commons, available at
<[https://commons.wikimedia.org/wiki/File:Antarctica_\(orthographic_projection\).svg](https://commons.wikimedia.org/wiki/File:Antarctica_(orthographic_projection).svg)>

*Who Will Govern Antarctica –
The Antarctic Treaty System or the United Nations?*

The common heritage of mankind principle is based on the assumption that resources in a global commons and their associated benefits should belong equally to all citizens of the world. The common heritage principle, first applied in 1982 in the UN Convention on the Law of the Sea, implies that national claims to Antarctica are redundant. Some UN members, led by Malaysia, tried in the 1980s to switch the governance of Antarctica to UN trusteeship, using the common heritage argument. The ATS members resisted strongly and successively. They watered down the requirements for “substantial research activity” to

permit ATS membership for India, Brazil, and China, thereby bringing 80 percent of the world's population into the ATS.

Some environmentalists used the common heritage principle as an argument to ban mining and establish a world park in Antarctica.

Greenpeace set up a World Park station on Ross Island in 1987. The Madrid Protocol to the ATS (1991) banned mining for 50 years, but did not establish a world park or mention common heritage. Meanwhile, environmentalists have actively attended ATS meetings and provided expert testimonies.



*Source: Wikimedia Commons, available at
<https://commons.wikimedia.org/wiki/File:McMurdo_Station.jpg>*

*American-operated McMurdo Station, Ross Island, Antarctica –
Base for Scientific, Including Environmental, Research*

Environmental Protection in the Antarctic Treaty System.

Four key environmental conventions protect Antarctica and the Southern Ocean. The Agreed Measures for the Conservation of Antarctic Fauna and Flora, intended to reduce human impact, were adopted in 1964 and put into force in 1982. The Convention for the Conservation of Antarctic Seals (adopted in 1972, effective in 1978) banned harvest of fur, elephant, and Ross seals and put quotas on killing of crabeater, leopard, and Weddell seals – to discourage the resumption of commercial sealing.



Source: Wikimedia Commons, available at
<[https://commons.wikimedia.org/wiki/File:Weddell_Seal_\(js\)1.jpg](https://commons.wikimedia.org/wiki/File:Weddell_Seal_(js)1.jpg)>

*Annual Harvesting Quotas for Weddell Seals –
Convention for the Conservation of Antarctic Seals*

The Convention on the Conservation of Antarctic Marine Living Resources (1980, 1982) applies to finfish, mollusks, crustaceans, and birds. A secretariat was established in Hobart, Tasmania to oversee catch limits, closed seasons, fishing methods, and ongoing inspections.



Source: Wikimedia Commons, available at
<[https://commons.wikimedia.org/wiki/File:Danco_Island_Antarctica_Gentoo_Penguins_3_\(47284465612\).jpg](https://commons.wikimedia.org/wiki/File:Danco_Island_Antarctica_Gentoo_Penguins_3_(47284465612).jpg)>

Gentoo Penguins, Danco Island – All Penguin Species Are Protected By the Convention on the Conservation of Antarctic Marine Resources

The Protocol on Environmental Protection, or Madrid Protocol (1991, 1998) replaced the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA), adopted in 1988. Australia and France decided not to ratify CRAMRA, which permitted restricted mining. The Madrid Protocol bans all mining in Antarctica until 2047,

creates a natural reserve dedicated to peace and science, and uses Environmental Impact Assessments (EIAs) and Comprehensive Environmental Evaluations (CEEs) to regulate environmental impacts.



Source: Wikimedia Commons, available at <https://commons.wikimedia.org/wiki/File:Antarctica.svg>

Contemporary Antarctica

Time Line for Antarctica

- 4th century BCE Aristotle postulated the existence of a southern continent, *Terra Australis Incognita* – balance the weight of the northern continents in a spherical Earth
- 1498 Vasco da Gama, Portuguese explorer – sailed around the Cape of Good Hope – proved that *Terra Australis* was not connected to Africa
- 1578 Francis Drake, English privateer – was blown into Drake’s Passage – proved that *Terra Australis* was not connected to South America
- 1592 John Davis, British Navy – first European discovery of the Falkland Islands
- 1675 Antoine de la Roché, English merchant – discovered South Georgia
- 1690 John Strong, British Navy – first recorded landing on the Falkland Islands
- 1713 Treaty of Utrecht – confirmed the Falkland Islands (Islas Malvina) as Spanish territory
- 1764 Antoine de Bougainville, French entrepreneur – first settlement in the Falklands – Port Louis, East Falkland Island
- 1765 Commodore John Byron – claimed the Falkland Islands for Great Britain – built Port Egmont on West Falkland Island

1767-1806	Spain bought France's interest in the Falkland Islands – forcibly evacuated the British settlers – governed the islands
1770s-1830s	New Island, off West Falkland – primary center for whaling in the Falklands
1770s-1860s	European whaling – primary economic activity in the Falkland Islands – mostly southern right whales
1772-1775	Captain James Cook, British Navy – crossed the Antarctic Circle at three dispersed places – proved that a southern continent had to be restricted to the south polar region
1775	Captain James Cook, British Navy – charted the coast of South Georgia – claimed it for England – named it after King George III
1784-1830s	European sealers slaughtered Antarctic fur seals in the Falklands – sold pelts in US and Europe
1786-1890s	European sealers slaughtered Antarctic fur seals and southern elephant seals in South Georgia – seal populations neared extinction
1806-1820	no formal Spanish governance of Falkland Islands – captains of sealing and whaling vessels dispensed justice
1820	Antarctica first sighted – three claimants – Thaddeus von Bellingshausen (Russia) – Edward Bransfield (Great Britain) – Nathaniel Palmer (United States)

1820-1833	Newly independent Argentina governed the Falkland Islands
1830s-1860s	Stanley – new port established by the British – port of call for whalers and other ships using the Cape Horn trade route
1833	Great Britain invaded the Falkland Islands – evacuated the Argentine settlers – set up a colony with British settlers
1839-1843	British Antarctic expedition – James Clark Ross discovered the Ross Sea, the Ross Ice Shelf, and the Admiralty Range
1846	Samuel Lafone – received grant from British government – to slaughter wild cattle, farm much of East Falkland Island
1851	Falkland Islands Company (FIC) purchased Lafone’s landholdings in the Falklands – introduced Cheviot and Southdown sheep
1852	Falkland Islands Company (FIC) received royal charter – right to operate 1.3 million acres (46 percent of total farm land)
1860s-1980s	economy of Falkland Islands depended on export of wool
1887	South Georgia was entered in the <i>Colonial Year Book</i> as a British dependency

- 1895 Henryk Bull, Norwegian businessman – made first confirmed landing on Antarctica at Cape Adare
- 1895 Sixth International Geographic Congress – rekindled interest in Antarctic exploration
- 1897-1899 Belgian Antarctic Expedition – Joseph de Gerlache – *Belgica* fixed in pack ice for 13 months – first expedition to over-winter on ship in Antarctica
- 1899-1900 British Antarctic Expedition – Carsten Borchgrevink – first expedition to over-winter on land in Antarctica
- 1901-1904 Swedish Antarctic Expedition – Otto Nordenskjöld – *Antarctic* sunk in early 1903 – crew rescued on Paulet Island
- 1901-1904 British *Discovery* Expedition – Robert Falcon Scott – Edward Wilson, Ernest Shackleton – 82 degrees, 16' South latitude
- 1903-1906 Norwegian *Gjoa* Expedition – Roald Amundsen – first to sail through the Northwest Passage in Arctic Canada
- 1904 first permanent settlement of South Georgia – Norwegian whalers established a shore station at Grytviken – Carl Anton Larsen
- 1904-1965 Norwegian whalers operated whaling stations in South Georgia

- 1907-1909 British *Nimrod* Expedition – Ernest Shackleton – Frank Wild, Eric Marshall, Jameson Adams – 88 degrees, 23’ South latitude, 112 miles from the South Pole
- 1908 United Kingdom declared sovereignty over South Georgia, the South Sandwich, Orkney, and Shetland Islands and Graham Land
- 1908 United Kingdom declared sovereignty over pie-shaped wedge of Antarctica – from the Falkland Island Dependencies (FID) southward to the South Pole
- 1908 Argentina extended its claim from the Falkland Islands to include South Georgia, the South Sandwich, Orkney, and Shetland Islands and Graham Land
- 1909 United Kingdom established its first government in South Georgia – Magistrate ruled as a representative of the Governor in the Falkland Islands
- 1910-1912 Norwegian *Fram* Expedition – Roald Amundsen – Helmer Hanssen, Sverre Hassel, Olav Bjaaland, Oscar Wisting – reached South Pole on December 14, 1911
- 1910-1912 British *Terra Nova* Expedition – Robert Falcon Scott – “Bill” Wilson, “Titus” Oates, Edgar Evans, “Birdie” Bowers – reached South Pole on January 12, 2012 – all died

- 1914-1916 British *Endurance* Expedition – Ernest Shackleton – 27 men – *Endurance* sank – 6 men on *James Caird* to South Georgia – 22 men later rescued on Elephant Island
- 1917 whaling in South Georgia peaked – six operating stations employed 1,000 workers
- 1923 United Kingdom, on behalf of New Zealand, declared sovereignty over pie-shaped wedge of Antarctica – Ross Dependency
- 1924 France declared sovereignty over pie-shaped wedge of Antarctica – Adélie Land
- 1930 large factory whaling ships undercut whaling industry in South Georgia
- 1933 United Kingdom backed Australia's claim of sovereignty over pie-shaped Australia Antarctic Territory – two-thirds of Antarctic claims in the British Empire
- 1939 Norway declared sovereignty over pie-shaped wedge of Antarctica – Queen Maud Land – to preempt Nazi Germany's claim
- 1940 Chile declared sovereignty over pie-shaped wedge of Antarctica – Chilean Antarctic Territory – overlapped Britain's FID claim
- 1943 Argentina declared sovereignty over pie-shaped wedge of Antarctica – Antartida Argentina – overlapped Britain's FID claim and Chile's claim

- 1946 US Navy deployed 4,700 men to take 70,000 photographs of Antarctica's coast
- 1946 International Whaling Commission formed – regulate whaling by setting harvesting limits for whale species
- 1957-1958 International Geophysical Year (IGY) – 7 claimants plus US, USSR, Japan, Belgium, South Africa – built 40 research stations on Antarctic continent, 20 on Antarctic islands
- 1959 Antarctic Treaty – 12 IGY countries signed Treaty – suspended national claims to Antarctic territory – banned military bases, nuclear sites – promoted scientific research
- 1961 Antarctic Treaty – 12 IGY countries ratified Treaty – later 16 other countries acceded to Treaty – must engage in scientific research – multilateral governance of Antarctica
- 1965 United Nations resolution on decolonization of the Falklands – mandated that the United Kingdom and Argentina begin discussions
- 1969 British Antarctic Survey was made responsible for administration of South Georgia and the South Sandwich Islands
- 1971 UK and Argentina – signed a Communications Agreement to establish regular shipping and air links between Falklands and Argentina
- 1976 military coup in Argentina

- 1978 The Convention for the Conservation of Antarctic Seals – banned harvest of fur, elephant, and Ross seals – put quotas on killing crabeater, leopard, and Weddell seals
- 1982 Argentina, led by General Leopoldo Galtieri, invaded the Falkland Islands – expected US support or neutrality
- 1982 South Atlantic War – United Kingdom defeated Argentina – about 1,600 deaths (255 British), \$2 billion cost
- 1982 UK government promised L56 million of development assistance to the Falklands over six years
- 1982 Antarctic Treaty System (ATS) began regulating the harvest of krill (shrimp-like organisms) – protect living marine resources
- 1982 Agreed Measures for the Conservation of Antarctic Fauna and Flora put in force – intended to reduce human impact
- 1982 The Convention on the Conservation of Antarctic Marine Living Resources – applies to finfish, mollusks, crustaceans, birds – catch limits, closed seasons, fishing methods
- 1985 UK government granted a new constitution for the Falkland Islands – British Overseas Territory – elected council responsible for all but defense and foreign affairs

- 1986 International Whaling Commission voted to cease whaling of all large whale species – Japan, Norway, USSR continued whaling
- 1987 Falkland Islands government created the Falkland Islands Interim Conservation and Management Zone (FICZ) – a 200-nautical-mile limit for fisheries rights and protection
- 1987 World Park Station – set up by Greenpeace on Ross Island – common heritage principle – banned mining
- 1980s Some UN members, led by Malaysia, tried to switch the governance of Antarctica to UN trusteeship – used the common heritage argument – ATS members resisted strongly
- 1980s Antarctic Treaty System (ATS) – expanded membership to include India, Brazil, China – covered 90 percent of world’s population
- 1991 International Association of Antarctic Tour Operators (IAATO) formed – more than 100 companies from 16 countries – self-regulates tourism in Antarctica – limits visits
- 1998 The Protocol on Environmental Protection (Madrid Protocol) to the ATS – banned mining in Antarctica until 2047 – created a natural reserve dedicated to peace, science

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Antarctica Expedition

Stanford Alumni Association Travel/Study Program and Zegrahm Expeditions

January 2-23, 2009

Ship-based, Aboard *Le Diamant*

Carcass Island, West Falkland, The Falkland Islands

We began our expedition in the northwestern portion of the Falklands archipelago. The Falklands Islands gained international notoriety in 1982, when a military junta government in Argentina invaded the British territory and precipitated a bloody three-month war. The unpopular Argentine junta lost its desperate gamble to deflect attention from its atrocious record on human rights and economic development. After Britain won the war, the Falklands prospered, largely due to income from offshore fishing licenses, the growth of tourism (50,000 tourists visited the Falklands last year, mostly on cruise ships), and local spending by the 1,500 British troops that are stationed in the Falklands. Sheep-ranching in the Falklands is threatened by low world prices for wool, but the islands' 88 large farms raise about 600,000 sheep on natural pastures.

At our first stop in West Falkland, Carcass Island, we saw Magellanic penguins, skuas, and upland geese at very close range. (On the entire cruise, we observed seven of the 19 species of penguins and four of the six species of seals that exist in the Southern Hemisphere.) The Rob Magill family, which owns Carcass Island, treated our group to an elegant morning tea. We cruised southward to New Island, where we hiked up to a large seaside colony of nesting black-browed albatrosses and rockhopper penguins. New Island is now a nature reserve. Tony Chater, one of the former owners, hosted us in a small museum that contained relics from the island's whaling days (1780-1840). We then

sailed for two days and enjoyed unusually calm seas in the “Furious Fifties” (known for high westerly winds that girdle the globe without being impeded by land).

Salisbury Plain and Grytviken, South Georgia

Our next destination was South Georgia, which houses one of the richest concentrations of sea mammals (Antarctic fur and elephant seals) and maritime birds (king penguins and albatrosses) in the world. Between 1904 and 1965, South Georgia housed a thousand Norwegian whalers at five permanent whaling stations. The British dependent territory now has only a few full-time residents plus 20 researchers from the British Antarctic Survey who spend the summers there. We spent three incredible days exploring bays on the eastern (leeward) coast of South Georgia. That island has been aptly described as a slice of Switzerland dropped into the midst of the South Atlantic Ocean. The rugged, snow- and glacier-covered mountain peaks are spectacular and awe-inspiring. South Georgia was a high point of the expedition.

South Georgia, along with the Galapagos Islands in Ecuador and the Arctic National Wildlife Refuge in Alaska, is considered by many to be one of the world’s three richest natural sites. We made five landings to observe seals and visit penguin colonies. The small island (a banana-shaped piece of land about 90 miles long and 16 miles wide) is home to an estimated 500,000 breeding pairs of king penguins, the second largest and brightest colored of the 19 penguin species. The king penguin is the only penguin species whose population has been growing in recent years. The beaches are covered with over 300,000 elephant seals (males can weigh 4.5 tons) and 4 million Antarctic fur seals (males weigh up to 450 pounds). After facing extinction from 19th-century sealers, the populations of elephant and fur seals have been expanding rapidly in the past 60 years.

Exceptionally good weather permitted us to make landings at three of South Georgia’s most notable penguin colonies – Salisbury Plain

(35,000 breeding pairs of birds), Fortuna Bay (7,000 breeding pairs), and St. Andrews Bay (100,000 pairs, the largest in South Georgia and the second largest in the world). King penguins have an unusual breeding cycle, which yields two chicks every three years. Hence, at each site, we were able to observe adult males and females molting or courting, others sitting on eggs or chicks, and year-old chicks (“Oakum boys”) shedding their initial brown fur and heading into the ocean to fish for 11 months. Adult king penguins weigh about 40 pounds, have few natural predators, and live to an average of perhaps 50 years. Each year they spend ten months fishing in the ocean and two months molting and breeding.

We visited Grytviken, the site of the largest and longest-lasting whaling station in South Georgia, which had seven shore stations during the height of the Antarctic whaling boom in World War I. Grytviken, the only current settlement on South Georgia, has an excellent museum, a research station for the British Antarctic Survey, and the gravesite of and memorial to Sir Ernest Shackleton (who died there in 1922), along with the ruins of the whaling station that closed in 1964. The last episode of Shackleton’s race for survival in the *Endurance* expedition (1914-1916) was his 17-mile crossing of the unexplored mountains of South Georgia following his horrendous 16-day boat journey from Elephant Island to the west coast of South Georgia. A third of our group retraced the final four miles of Shackleton’s crossing on a challenging 3.5-hour hike over a mountain saddle.

South Orkney Islands

After three breath-taking days in South Georgia, we sailed southwestward to the South Orkney Islands, another British possession. We cruised in our Zodiacs between tiny Monroe Island and Coronation Island, one of the four main islands in the South Orkney archipelago. We observed a small colony of nesting chinstrap penguins, one of the three brush-tail Antarctic penguins (along with the gentoos and the Adélies). The chinstrap penguins are aptly named because they have a black line that runs from ear to ear under their chins and gives them the

appearance of having perpetual smiles. The scenery of deep blue icebergs floating among mountains in the cove was awe-inspiring. One of our lecturers had spent five years with the British Antarctic Survey in the South Orkneys, and he felt we were fortunate to have experienced balmy summer weather.

Elephant Island

Elephant Island, named for its large population of elephant seals, is one of the eastern-most of the South Shetland Islands, a British possession since 1820. This barren island earned an indelible place in Antarctic history in 1916 when 22 men from Sir Ernest Shackleton's *Endurance* expedition over-wintered there, surviving mostly on seals and penguins. Shackleton and five other men made an incredible 16-day voyage in a 22-foot whaleboat, enduring hurricane storms from Elephant Island to South Georgia, 800 miles to the east. Frank Wild, Shackleton's right-hand man, skillfully led the group marooned on a tiny beach on Elephant Island. Shackleton made four attempts to break through the winter pack ice before finally reaching Elephant Island to rescue his men on August 30, 1916. We Zodiac-cruised around Point Wild, where the 22 men miraculously survived.

Paulet Island and the Eastern Antarctic Peninsula

Paulet Island is located 50 miles east of the Antarctic Peninsula in the northern Weddell Sea. Paulet carved its niche in Antarctic lore in 1903. The *Antarctic*, the ship used by the Swedish Antarctic Expedition (1902-1904), was crushed by summer pack ice and sank in the Weddell Sea, 25 miles east of Paulet Island. Captain C. A. Larson and his 20 men escaped to Paulet, built a large (34 feet by 22 feet) stone hut there, and over-wintered between February and October 1903. In a series of miraculous encounters, an Argentine ship, the *Uruguay*, rescued the Paulet survivors and two other groups of Swedish scientists who were working in the north Weddell region. Otto Nordenskjold, the leader of the expedition, and eight other scientists carried out some of the best

geological and zoological research in Antarctica to that date, before being rescued.

On Paulet Island, we worked our way through a few snorting elephant seals on the beach and hiked up to an enormous colony of nesting Adélie penguins, another of the three brush-tail Antarctic penguins (along with the gentoos and the chinstraps). The monogamous Adélies alternate sitting on their nests of two eggs, allowing both females and males time to enter the ocean to feed on fish and krill (small shrimp-line creatures). During the next morning, we made our first landing on the continent of Antarctica, the world's fifth largest, driest, and coldest continent. Brown Bluff houses a large colony of orange-billed gentoo penguins on an ice-filled beach. The gentoos have the widest range of any of the penguin species in the Southern Ocean. We also hiked up a hillside to observe nesting show petrels, one of the three most difficult birds to see in the wild.

Deception Island

Deception Island is a small volcanic caldera located in the western part of the South Shetland Island archipelago. The island is shaped like a horseshoe around a protected bay. Along with the rest of the South Shetlands, Britain claimed possession of Deception Island in 1820. Whalers' Bay housed a Norwegian whaling station between 1910 and 1931, which had a 21-year lease from the British. The British Navy occupied the deserted whaling station in 1944 as part of Operation Tabarin, an effort to prevent Nazi German u-boats from controlling the Drake Strait between the Atlantic and Pacific Oceans. The naval base was converted to a research station in 1946. Following volcanic eruptions in 1967, 1969, and 1970, the British Antarctic Survey abandoned its Deception base. Today Argentina and Spain maintain research stations on Deception Island.

Unusually rough seas prevented our landing at Baily Head, which houses a vast rookery of chinstrap penguins. We landed our Zodiacs

inside the caldera at Whalers' Bay to visit the abandoned whaling station and research base and to hike along the beach up to a viewpoint called Neptune's Window. Some passengers swam briefly in the 31-degree Antarctic Ocean water, slightly heated by volcanic natural hot springs. During the afternoon, we sailed up the bay to Telefon Bay. There we hiked up the hillside to observe the volcanic crater left by the 1970 eruption. Our geologists were delighted to point out the unique braided outwash plain inside the crater. Many in our group then hiked up to the top of the ridge to enjoy a spectacular view of the bay and its scenic surrounding caldera.

The Western Antarctic Peninsula and Goudier Island

We made our second continental landing at Neko Harbor on the western side of the Antarctic Peninsula and observed gentoo penguins protecting their chicks from predatory skua birds. In the afternoon, we entered the renowned Lemaire Channel – seven miles of spectacular mountains and glaciers between the continent and Booth Island. We later Zodiac-cruised around Pléneau Island amid huge sculptured icebergs. Having reached our southern-most point of 65 degrees south latitude, we reversed our journey and re-sailed the Lemaire Channel in a northerly direction. Several orcas (killer whales) swam right under our ship. We visited a Chilean research station, Gonzalez Videla, at Paradise Bay and a former British station and current museum at Port Lockroy on Goudier Island. Port Lockroy also was part of Operation Tabarin in World War II.

Drake Passage and Ushuaia and Buenos Aires, Argentina

Neptune was not so kind to us during our crossing of the 600-mile Drake Passage in the “Furious Fifties.” We experienced 40-foot swells and 100-miles-per-hour winds in the two-day trip from the Antarctic Peninsula to Cape Horn. But only a few passengers got sick in the infamous “Drake Shake.” After crossing the Drake Strait, we sailed up the Beagle Channel to Ushuaia, Argentina, the southernmost town in the

world. Ushuaia's optimistic town motto is "The end of the world and the beginning of everything." There we disembarked *Le Diamant* and flew back to Buenos Aires, Argentina's capital and largest city. The Buenos Aires metropolitan area houses 13 million of Argentina's 38 million people. We celebrated our return with a huge Argentine steak. Then we flew home, full of warm memories of chilly yet captivating Antarctica.

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The Falkland Islands, South Georgia, and Antarctica
Clipper Cruise Line
November 10-December 2, 2003
Ship-based, Aboard the *Clipper Adventurer*

Cuverville Island and Neko Harbor, Antarctic Peninsula

The next day was the most incredible one of the entire trip. In the morning, we landed on Cuverville Island, west of the Antarctic Peninsula. On that small island we had our first true Antarctic experience – a swelling blizzard in biting cold weather amid a gentle colony of gentoo penguins that were tobogganing down the hills and porpoising through the nearby waters. The setting was spectacularly Antarctic with glaciers decorating the snow-covered mountains. In the afternoon, we landed on the continent of Antarctica, the world's fifth largest, driest, and coldest continent. Our landing was at Neko Harbor on the western part of Palmer Land in the northern portion of the Antarctic Peninsula. The weather turned warm and sunny, we drank champagne from Napa Valley, and the colonies of gentoo penguins performed admirably for us. We lay in the snow watching the penguins in a state of near reverie. During dinner, we were treated to an unbelievable show by 20 or so killer whales (orcas) that were diving near our ship for an hour. At the same time, Antarctica experienced a partial eclipse, which we observed carefully through special glasses in the sunlit evening. Then we retreated to the ship's lounge for a moving

reading of Samuel Coleridge's *Rime of the Ancient Mariner*, performed by a large number of our passengers. It was a perfect ending to a fabulous day.

Paradise Bay

Our good fortune with the weather continued during the morning of the following day. We spent that morning in aptly-named Paradise Bay. The sun shone brightly, outlining the glaciers, icebergs, and snow-clad mountains. We Zodiac-cruised next to an iceberg on which a crabeater seal had hauled out (there are perhaps 30 million crabeaters in the Antarctic), and on a different iceberg we watched a treacherous leopard seal sun bathe and swim around (the leopard seal is the main predator of penguins). Gentoo penguins had happily taken over an empty research station, unused by Argentina for the past three years because of that country's economic woes. In the afternoon, we experienced some of Antarctica's infamous miserable weather – a 60-mile-per-hour gale and biting cold. We braved the elements for a couple of hours, gaining valuable first-hand insight into what the explorers and researchers of Antarctica had to endure.

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South America Expedition By Private Jet

TCS Expeditions

February 19-March 11, 2002

Airplane-based

Falkland Islands, United Kingdom

Sandra and I had spent a pleasant and interesting day in Stanley, the capital and home of much of the islands' population, two years ago. We thus opted to spend our two days in the Falklands in one of the out-of-the-way islands. Sea Lion Island, five miles wide and 1.5 miles thick, is the home of five permanent residents during the eight months of the

tourist season. Those five people run a marvelous little lodge that sleeps 16 guests. The lodge is easy walking distance from a colony of 4,000 breeding pairs of Magellanic penguins, numerous elephant seals, and large numbers of sea lions. Thirty minutes in a Land Rover takes one to a breeding colony of 5,000 rock-hopper penguins. Pristine sandy beaches are interrupted only by occasional snorting sea lions demanding the right of way. Sea birds are everywhere. This idyllic place was a highlight of our trip, since we could relax with fellow passengers, stroll to observe animals, and even send free e-mail messages. If you visit the Falklands, we recommend Sea Lion Island as a fascinating tourist destination.

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