Exploration, Exploitation and Explanation: Some Historical Relations in Antarctica.

by

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Outline

Proposition: Antarctica has become known to us through interactions within and among Exploration (mapping), Explanation (science) and Exploitation (use and consumption of extant resources).

Evidence: Revealed through the historical record of travel to and within the region over the past 250 years, a process that continues today and points to a future.

Focus: Primarily the Antarctic Peninsula and adjacent Southern Ocean and Sub-Antarctic Islands and with some reference to continental Antarctica.
Some Background

How did Antarctica come to be as it is?

What is it like today?

How is it governed?

What is its future?
Geographic Isolation 35m years ago

Separation from S America

Circumpolar Ocean and Atmosphere Circulation
How do we know that Antarctica has changed position and may not have looked like it does now?
Some Basic Facts Today

- Considered to be the 7th continent - on the “bucket list”!
- Covers approx. 14 million km² + winter sea ice more or less doubles the size - but this changing.
- Highest continent with average elevation of 2500m, south pole is at 2835m, Mt. Vinson is highest point at 4892m (also on “bucket list”), lowest point is Bentley Subglacial Trench at -2555m.
- Glacier ice and snow cover 98% of Antarctica, has average thickness 1800m, contains 30 million km³ of ice which constitutes roughly 62% of all the freshwater on Earth.
- Under all this is Antarctica a single landmass or an archipelago?

Source: Gov’t. of Australia
Deglaciated Antarctic Topography

Height Above Sea Level (m)
Today it is governed through the Antarctic Treaty System
The Antarctic Treaty System (ATS)

- Composed of the Treaty itself plus numerous protocols, conventions and other attachments for regulation of all activity in the region.
- It sets aside the area south of 60 deg S as a scientific preserve with freedom of investigation within limits and an area devoted to peace.
- The 12 countries most involved in Antarctic research during IGY 1957-58 negotiated the Treaty among themselves and signed it in 1959. It came into force in 1961.
- Today there 54 countries party to the Treaty of which 29 have “consultative” (voting) status.
- The ATS Secretariate presently is in Buenos Aires.
- As part of the agreement, the 7 countries with national claims in the region set those claims aside.
National Claims and Stations
Some Key Expeditions To 1941

• 1772-75 James Cook  British Naval Expedition  Resolution
• 1822-24 James Weddell  British Sealing Expedition  Jane
• 1838-42 Charles Wilkes  United States Exploring Expedition  Vincennes
• 1839-43 James Clark Ross  British Naval Expedition  Erebus and Terror
• 1872-76 C.W. Thompson  British Naval Voyage  Challenger
• 1892-93 Carl A. Larsen  Norwegian Sealing and Whaling Expedition  Jason
• 1901-04 Robert F. Scott  British National Antarctic Expedition  Discovery
• 1901-04 Otto Nordenskjöld  Swedish South Polar Expedition  Antarctica
• 1902-04 William S. Bruce  Scottish National Antarctic Expedition  Scotia
• 1907-09 Ernest Shackleton  British Antarctic Expedition  Nimrod
• 1910-13 Robert F. Scott  British Antarctic Expedition  Terra Nova
• 1914-16 Ernest Shackleton  British Imperial Trans-Antarctic Exped.  Endurance
• 1928-30 Robert E. Byrd  United States Antarctic Expedition  City of New York
• 1939-41 Robert E. Byrd  United States Services Expedition  North Star
After 1941?

- Operation Tabarin 1944-46.
- Falkland Islands Dependencies Survey 1947-62.
- International Geophysical Year 1957-58.
- British Antarctic Survey 1962-present plus many other national programs (e.g. USA, USSR/ Russia, Argentina, Chile, Australia, New Zealand, Spain...)
- Ms Lindblad Explorer sails 1969.
Shortcuts to Antarctic History (With emphasis on Antarctic Peninsula)

• Boothe, Joan N. 2011. The Storied Ice: Exploration, Discovery and Adventure in Antarctica’s Peninsula Region. Berkeley, CA, Regent Press. - probably the best complete history covering the Antarctic Peninsula and surroundings.

• Harrison, John. 2012. Forgotten Footprints: Lost Stories in the Discovery of Antarctica - this is a first-rate compendium of historical ventures into the Antarctic for exploratory, scientific and commercial purposes with a focus on the South Shetland Islands and Antarctic Peninsula region.

• Walton, David W. (Ed.) 2013. Antarctica: Global Science From a Frozen Continent. London, Cambridge University Press - an excellent contemporary and historical source on science in the Antarctic, composed of individual chapters written by experts from the various subject fields.
Exploration, Exploitation and Explanation

Capt. James COOK
Capt. Carl LARSON
Prof. William BRUCE
Exploration, Exploitation, Explanation

Sir Vivian Fuchs  Lars Eric Lindblad  Prof Susan Solomon
The Iconic Cape Horn
The Sea - Drake Passage
Wandering Albatross
Exploration: Capt. Cook arrives in South Georgia 1775
Fortuna Bay and König Glacier Today
Elephant Seal
The Sealers - 1820s

Focus on maximum harvest of fur and oil.

S. Shetlands, S. Orkneys, S. Georgia.

Some exploration for source areas.

Not much sharing of findings.

New knowledge emerged nonetheless.

Weddell navigation of the Weddell Sea 1823.

Area sealed out by 1826 or so.
National Exploring Expeditions - 1820s-40s

Characterized by expansion of national interest, mapping new territory, collecting data and samples, scientific description and attempts at explanation, etc.

1. J.S. Dumont d’Urville 1826-29 French Naval Expedition Astrolabe.


Whalers Arrive and Sealing Returns 1890s...

Grytviken, S. Georgia
Science Piggybacks on Harvesters

William Speirs Bruce, Scottish naturalist and oceanographer, accompanied the Dundee Whaling Expedition to the Southern Ocean in 1892-93. Later, 1902-04, he led the Scottish National Antarctic Expedition that produced our basic knowledge of the Scotia Sea and established what has become the longest standing weather station in Antarctica and Southern Ocean, now Argentina’s Orcadas Base on Laurie Island, South Orkneys.

Robert Cushman Murphy, accompanied the whaling brig, Daisy, to South Georgia in 1912-13 where he completed the first ornithological inventory in the Bay of Isles and chronicled his time there in Logbook for Grace. His Oceanic Birds of South America that followed years later remains the classic in the field.
Carl Larsen, Otto Nordenskjold and Swedish South Polar Expedition (Antarctica) 1901-04.
Prospecting and Collecting

Falkland Is.  
S. Georgia  
Antarctic Sound  
Weddell Sea  
Paulet Island  
Hope Bay  
Snow Hill Island
The expedition had engaged assistance from Argentina conditional on the inclusion of Sobral, a Navy Sub-Lieutenant. Sobral went on to obtain a PhD in Geology from U. of Uppsala, serve as the father of the Argentinian Antarctic Program for decades, and serve as Argentina’s Ambassador to Sweden for a term. A “supernumerary” makes good!
Carl Larsen established Grytviken in 1904, having visited the cove in 1902, during the 1901-04 expedition. Six other whaling stations followed. Whaling ceased in the 1960s. Today, Grytviken is maintained as a historical site by the South Georgia Heritage Trust. Nearby is the British Antarctic Survey and GSGSSI station at King Edward Point.
Shackleton passed away at Grytviken in January 1922 due to a heart ailment. This was during his 4th expedition to Antarctica. He was an accomplished leader and explorer. Though not a scientist, he supported scientific work on all his expeditions. He is most remembered for the *Endurance* expedition of 1914-17. He was one of the leading actors during the “Heroic Age” of Antarctic exploration.
The “Heroic Age” - Exploration and Much More 1900-1917.

Source: D. Wilson 2011. The Lost Photographs of Captain Scott
The British Antarctic “Terra Nova” Expedition 1910-13

Capt. Robert Falcon Scott

H. Ponting Photo
And Others

- Griffith Taylor - Chief Geologist
- Frank Debenham - Geologist
- Raymond Priestly - Geologist
- Edward Nelson - Biologist
- Dennis Lillie - Biologist
- Apsley Cherry-Garrard - Zoological Assistant
Accomplishments

• South Pole January 17, 1912 completing the Beardmore Glacier route, gathering detailed met data, geological samples, glaciological observations, photographic record along the way

• Northern Party meteorological, geological, biological studies and collections in Cape Adare region, Victoria Land, 1911-12.

• Discovery of McMurdo Dry Valleys, geological glaciological, biological data collection and mapping in area west of McMurdo Sound, March 1911, November 1911-March 1912.

• Establishment of Cape Evans Base, McMurdo Sound January 1911-January 1913, most complete meteorological record, including upper air data, of early 20th Century in Antarctica, an important base line in climate change studies.


• Met work of Simpson, in concert with that of Gilbert Walker in Simla, India illustrated the connectivity of global atmospheric systems.

• An unmatched legacy in expertise.
Prof Solomon and “The Coldest March”

In the meantime, whaling carries on in Southern Ocean waters.

Whaler’s Bay, Deception Is.
And Antarctic Waters

Mikkelsen Harbour, Antarctic Peninsula
After 1941?

• Operation Tabarin 1944-46.
• Falkland Islands Dependencies Survey 1947-62.
• International Geophysical Year 1957-58.
• British Antarctic Survey 1962-present plus many other national programs (e.g. USA, USSR/ Russia, Argentina, Chile, Australia, New Zealand, Spain...)
• Ms Lindblad Explorer sails 1969.
• Antarctic Environmental Protocol 1991.
Minerals and the 1991 Environmental Protocol

Horseshoe Island
Operation Tabarin and the Claims Game

Base A - Port Lockroy
Port Lockroy Today - Bransfield House restored and operated by UK Antarctic Heritage Trust as a museum, post office and souvenir store.
National Claims and Stations

[Map showing national claims and stations in Antarctica with various symbols and labels indicating different zones and populations.]
International Geophysical Year 1957-58
The Commonwealth Trans-Antarctic Expedition (1956-58)

Sir Vivian Fuchs
The Antarctic Treaty
Signed 1959 and came into force 1961 and has been strengthened through time with addition of conventions and protocols to create the The Antarctic Treaty System
Lindblad Explorer Sails - 1969
A New Form of Exploitation - Adventure Tourism?

Lars Eric Lindblad
**Recorded Seaborne Tourism**  
*Does Not Include S. Georgia and Falkland Is.*  
*(2019-20 estimated based on pre-season bookings)*  
*Source: IAATO*

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Source: IAATO 2018-19 Season
What is IAATO?

• International Association of Antarctic Tour Operators.
• A member organization founded in 1991 to advocate and promote the practice of safe and environmentally responsible private-sector travel to the Antarctic.
• At present 100 or more operators are members.
• Establishes and manages procedures, guidelines and some regulations for such things as: landing sites, activities, numbers of visitors ashore, staff to visitor ratios, expedition staff qualifications, wildlife watching, biosecurity, etc.
• All of which operates within the framework of the Antarctic Treaty System, regulations of the Govt. of South Georgia and South Sandwich Islands, and relevant international marine safety and operational regulations.
Exploration, Exploitation, Explanation in the Context of the Adventure Cruise Industry

• Exploitation: very definitely using a unique biogeophysical region for commercial gain.

• Explanation: heavy reliance on education - shipboard and ashore, experiencing and contributing to research (e.g. citizen science programs, whale safari cruises with researchers).

• Exploration: given that the terrestrial surface and some segments of the ocean basins are “KNOWN”, exploration as known in the 18th, 19th and early 20th centuries is no longer possible. Perhaps the concept has new meaning?
What we have learned may aid in the exploration and management of the future in this rapidly changing environment. The apparent physical geographic isolation of Antarctica 35m years ago was an illusion.