
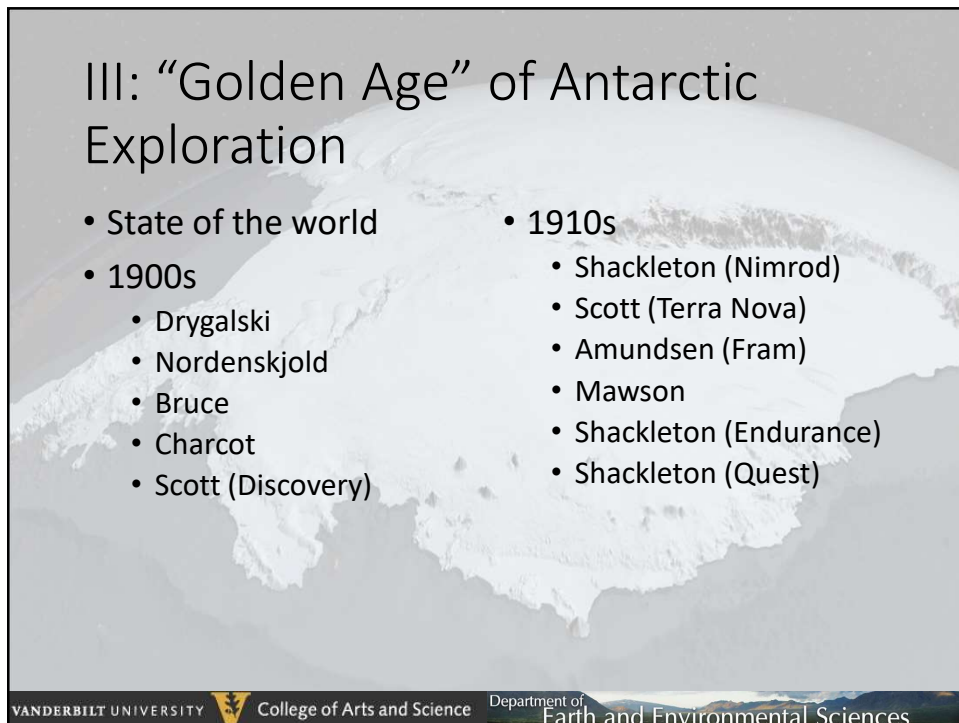


Antarctica: At the heart of it all


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Vanderbilt University
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Spring 2021
[Webcams for Antarctic Stations](#)

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III: “Golden Age” of Antarctic Exploration

- State of the world
- 1900s
 - Drygalski
 - Nordenskjold
 - Bruce
 - Charcot
 - Scott (Discovery)
- 1910s
 - Shackleton (Nimrod)
 - Scott (Terra Nova)
 - Amundsen (Fram)
 - Mawson
 - Shackleton (Endurance)
 - Shackleton (Quest)

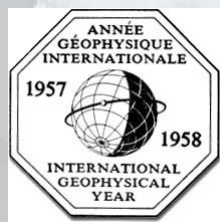
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Scurvy

- Vitamin C deficiency
- Ascorbic Acid
 - Makes collagen in body
- Limits ability to absorb iron in blood
 - Low hemoglobin
 - Oxygen deficiency
- Some animals can make own ascorbic acid, not higher primates



International scientific efforts



- International Polar Years
 - 1882-83
 - 1932-33
 - 1955-57
 - 2007-09

Erich von Drygalski (1865 – 1949)

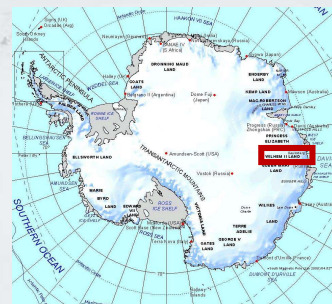
- Geographer and geophysicist
- Led expeditions to Greenland 1891 and 1893



Die Deutsche Südpolar-Expedition.
 1. Prof. Dr. v. Drygalski, 2. Dr. Philipp, 3. Prof. Dr. Vanhöffen, 4. Obermundschichtsch. 5. Dr. Biddisgmaier,
 6. Boer-Offizier Lerche, 7. Kapitän Kuxner, 8. Zehner Offizier Tschal, 9. Dr. Gaertt.

German National Antarctic Expedition (1901-04)

- *Gauss*
- Explore east Antarctica
- Trapped in ice March 1902 – February 1903
- Hydrogen balloon flight
- First evidence of larger glaciers
- First ice dives to fix boat



Dr. Nils Otto Gustaf Nordenskjold

(1869 – 1928)

- Geologist, geographer, professor
- Patagonia, Alaska expeditions
- *Antarctic* boat




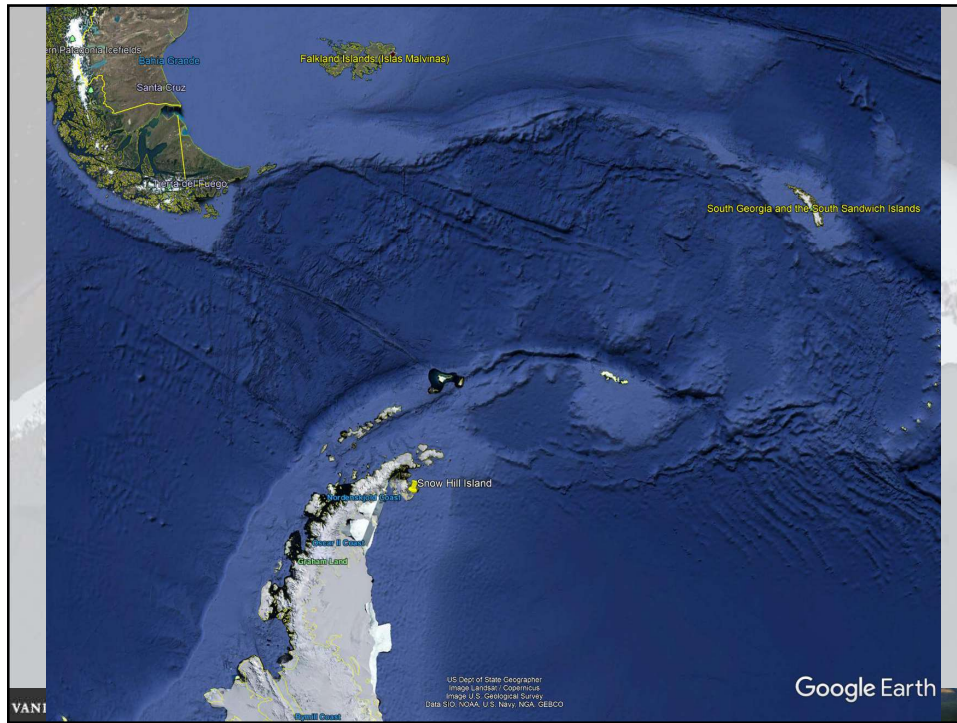
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Swedish Antarctic Expedition: 1901-04

- Nordenskjold and 5 others to winter on Snow Hill Island, 1902
- Weather and magnetic observations
- *Antarctic* goes north, maps, to return in summer (Dec. 1902 – Feb. 1903)



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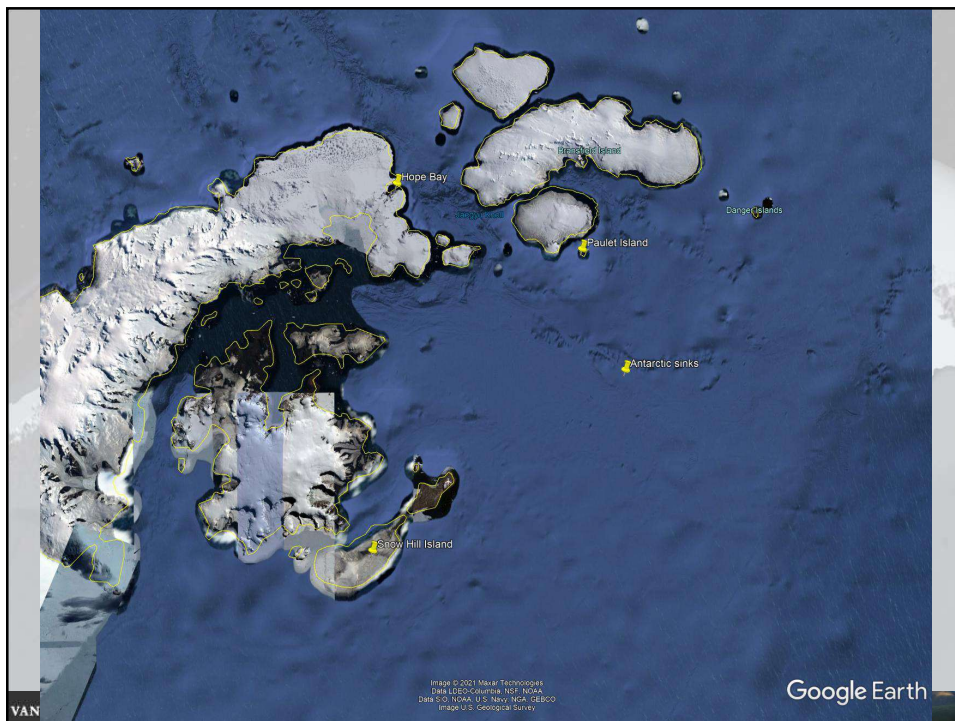
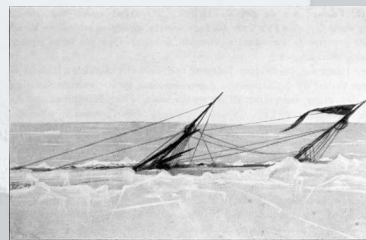
Attempts to make it to Snow Hill Island: 1

- November and December, 1902 too much ice
- December 1902: Three meant put ashore at hope bay, try to sledge across ice
- Can't make it, spend winter in rock hut

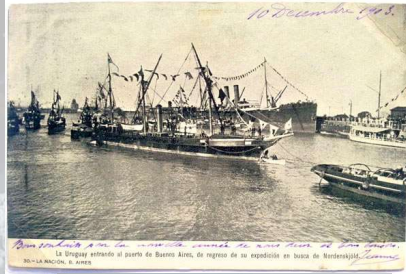


Attempts to make it to Snow Hill Island: 2

- *Antarctic* stuck in ice, January 1903
- Crushed and sinks, Feb. 12, 1903
- Walk 25 miles to Paulet island with 1 ton food, 240 liters of fuel, 1 cat: Feb. 28, 1903
- Spend winter of 1903 in rock hut



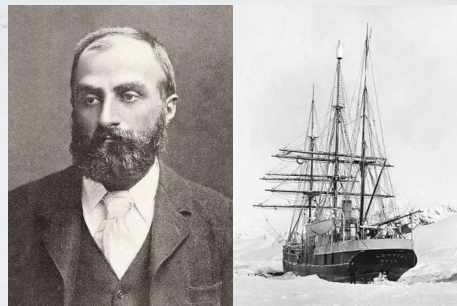
Rescued!



- October 1903, 3 leave Hope Bay for Snow Hill
- 6 men from Paulet go to Hope Bay
- Find each other near Snow Hill
- Rescue boat *Uruguay* goes to Snow Hill Island on Nov. 4, 1903, Paulet Island Nov. 11

William Speirs Bruce (1867-1921)

- Scottish
- Oceanographer
- Whaling in Antarctica
- Ben Nevis weather station
- *Scotia* for the Scottish National Antarctic Expedition



Jean-Baptiste Charcot (1867 – 1936)

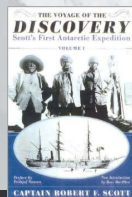
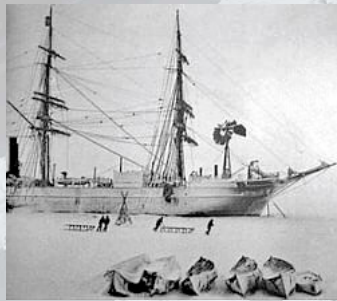


Jean-Martin Jean-Baptiste



- Father, Jean-Martin Charcot, contemporary of Freud
- *Français* 1904-07
 - Look for Nordenskold
- Charted 1250 miles of coastline
- *Porquoi-Pas?* 1908-10

British National Antarctic Expedition, 1901 – 1904, “Discovery Expedition”



- Scientific research and geographical exploration
 - Scott is in command
- First national expedition since Ross
 - Great international interest
 - Lack of experience
- Half funded by government, half raised by societies

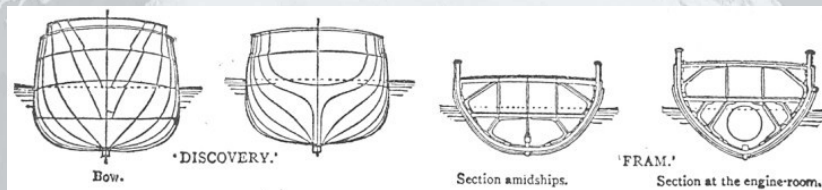
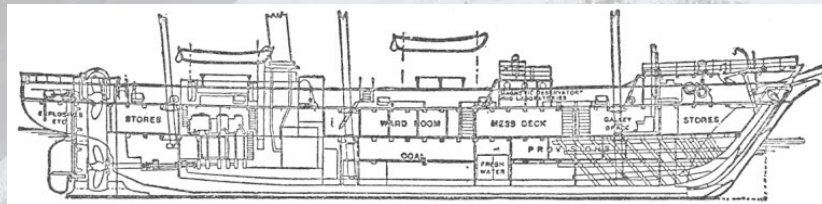
RRS *Discovery*

Built 1900-01

- Royal Research Ship
- Sails and steam engine
- Reinforced hull to withstand being frozen into the ice
- Ram ice, ride over it, crush with weight of ship
- Sailed poorly, rolled terribly



RRS *Discovery*

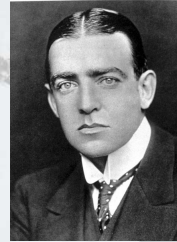


Discovery expedition

- [Gear](#)
- Personnel
 - Louis Bernacchi – only member with Antarctic experience
 - Ernest Shackleton – Third Officer: in charge of holds stores provisions, entertainment
 - Edward Wilson – junior doctor, zoologist
 - Frank Wild - explorer



Louis Bernacchi



Ernest Shackleton

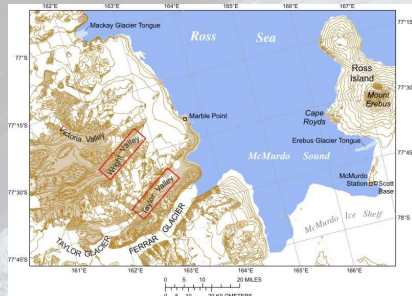


Edward Wilson

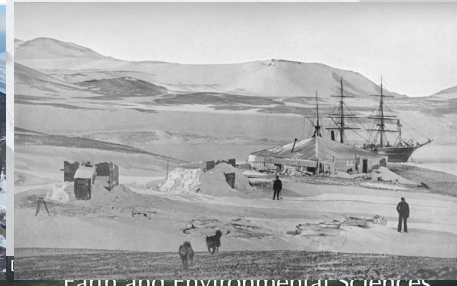
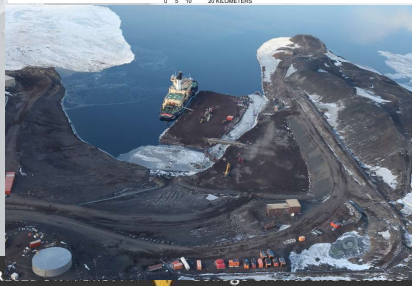


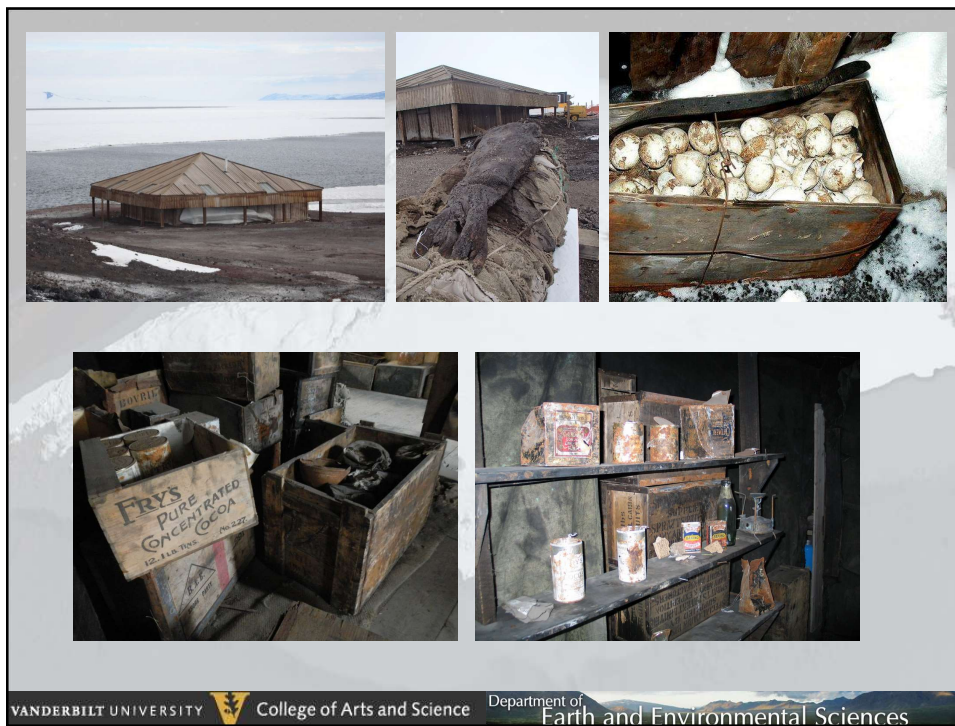
Frank Wild

Hut point and Winter Quarters Bay



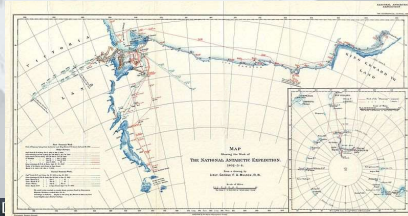
- Discovery arrives Jan/Feb 1902
- Build hut by March 1902
- Cold!





Southern Journey

- Scott, Shackleton, and Wilson
- Nov 2, 1902 – Feb 3 1903
- 960 miles
- 82°17' South
- Snow blindness, frostbite, scurvy
 - Shackleton collapses



Sastrugi: sharp, irregular grooves and ridges formed on a snow surface by wind erosion and recrystallization



Western Journey

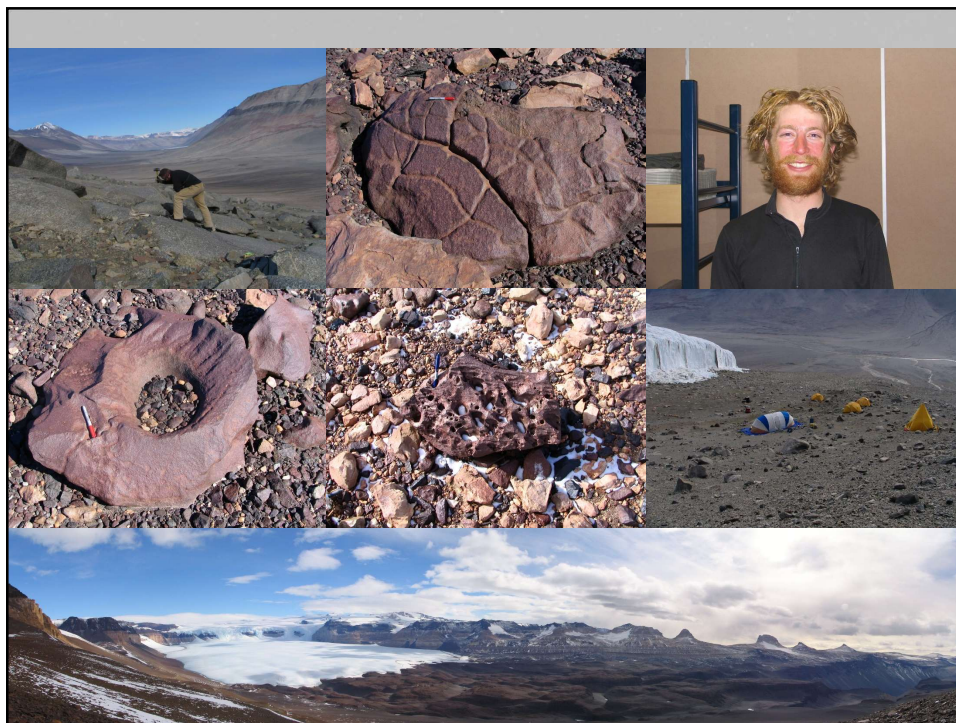


- Oct 26, 1903 – Dec 24, 1903
- No dogs, just “man-hauling” sledges
- Discover polar plateau and dry valleys
- 700 miles in 59 days



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Sciences



Sir Ernest Henry Shackleton - Britain

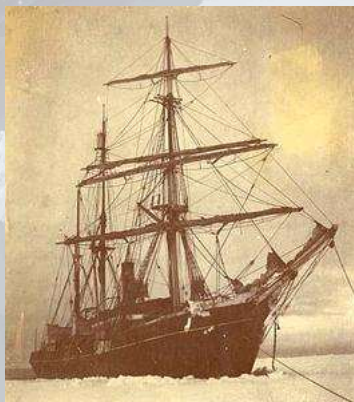
(1874 – 1922)

- Born in Ireland
- Apprenticeship “before the mast” at age 16, merchant ships
- Interviews for National Antarctic Expedition, commissioned to Royal Navy



Shackleton in 1901

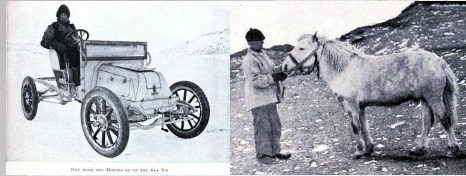
Shackleton I: British Antarctic Expedition, 1907-09 “Nimrod Expedition”



The *Nimrod*, a 40 year-old sealer

- Raises money to fund trip (Beardmore, Guinness)
 - RGS backs Scott
- Competition among explorers
- To reach geographical and magnetic south poles
- 15 men in party

Nimrod Expedition

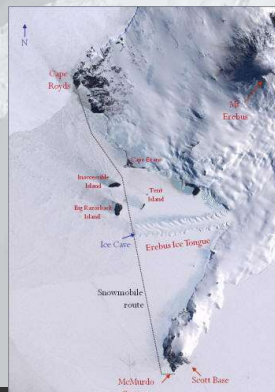


L to R: Dr. Alister Mackay, Prof. Edgeworth David, and Sir Douglas Mawson at the magnetic South Pole, January 16, 1909

- Dogs, Manchurian ponies, motor vehicles
- Personnel:
 - Frank Wild
 - Raymond Priestley (geologist)
 - Douglas Mawson (geologist): First climb of Mt. Erebus, first to reach magnetic south pole

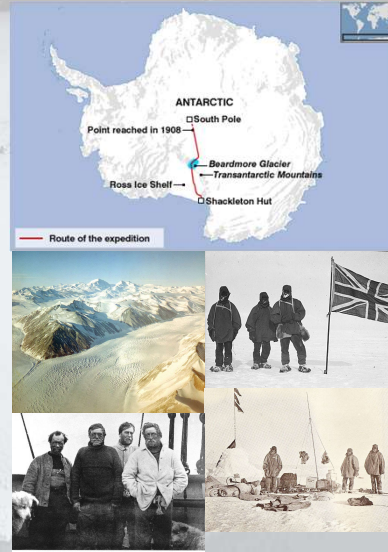
Cape Royds

- Scott and Shackleton feud about camp location



“Great Southern Journey”

- Ponies used, but don’t last long
- Oct 29, 1908 – turn around Jan 9, 1909
 - 88°23’ S (112 miles from pole!)
 - Shackleton, Wild, Eric Marshall, and Jameson Adams
 - Run out of food
- Back in McMurdo Feb 28
 - Nimrod leaving March 1



“I thought, dear, that you would rather have a live ass than a dead lion.” – Shackleton to his wife

“Race” to the South Pole

Amundsen

- Originally planning to attempt North Pole
 - Cook and Peary claim North Pole in 1908/09
- Funding tied to Arctic work
- Announces change of plan in Madeira, Sept 1910

Scott

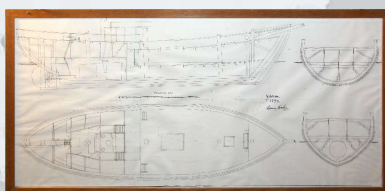
- Backed by RGS for second journey
- Waiting for Shackleton results
- Sent Amundsen instruments, tried to call in Norway

Amundsen, Fram

- 39 meters long, 11 meters wide
 - Wide and shallow
- Windmill to generate electricity
- Diesel engine added for Antarctica
- 15 men

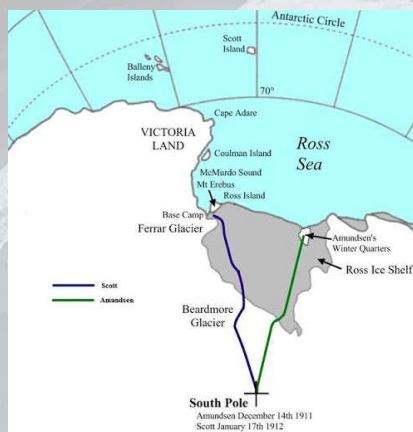


The *Fram* in pack ice in Antarctica



Designed to pop up when pushed by ice

Bay of Whales



- 60 miles farther south than McMurdo
- *Framheim* camp on ice shelf, not land



South Pole Journey



- Lay supplies Feb, Mar 1911
 - Seal meat for scurvy
- Spend winter working on supplies
- Attempt start Sept 8 1911
 - Too cold
- Start Oct 19, 1911
- Skis and dogs

South Pole

L to R: Amundsen, Hanssen, Hassel, and Wisting at "Polheim" Dec 15, 1911



Return from pole

- Reach Framheim Jan. 25, 1912
- 99 days, 10 fewer than scheduled
- Started with 52 dogs, finished with 11
- Leave Antarctica Jan. 30, 1912

