
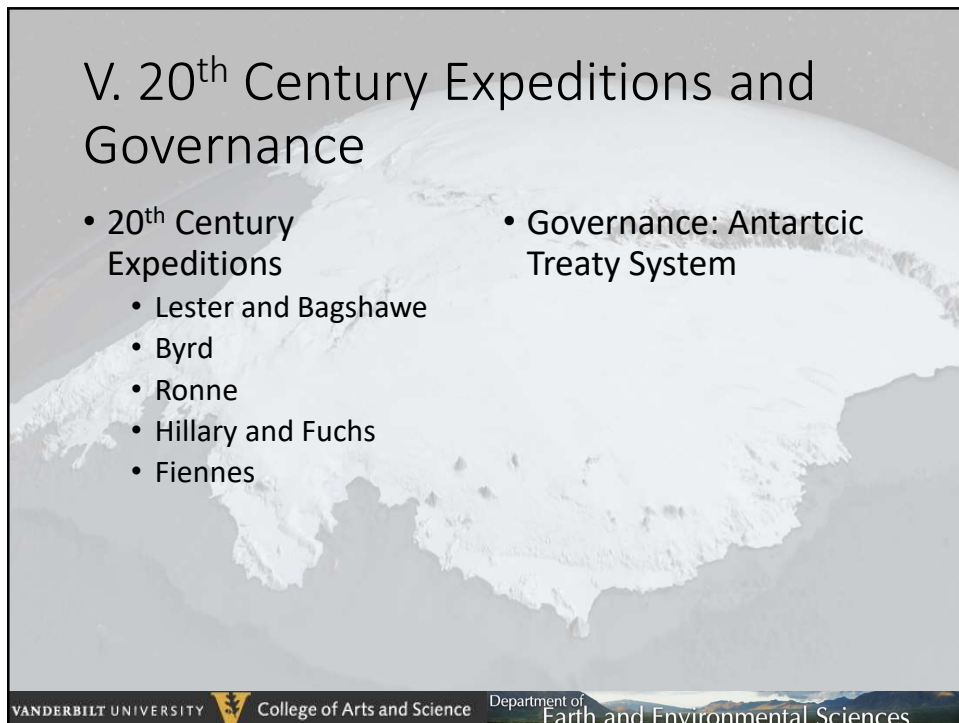


Antarctica: At the heart of it all


Dr. Dan Morgan
Associate Dean – College of Arts & Science
Principal Senior Lecturer – Earth & Environmental Sciences
Vanderbilt University
Osher Lifelong Learning Institute
Spring 2021

VANDERBILT UNIVERSITY  College of Arts and Science Department of Earth and Environmental Sciences



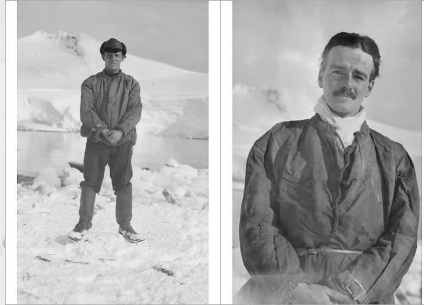
V. 20th Century Expeditions and Governance

- 20th Century Expeditions
 - Lester and Bagshawe
 - Byrd
 - Ronne
 - Hillary and Fuchs
 - Fiennes
- Governance: Antarctic Treaty System

VANDERBILT UNIVERSITY  College of Arts and Science Department of Earth and Environmental Sciences

British Imperial Antarctic Expedition 1920-22: Cope's Expedition or "Lester and Bagshawe"

- John Lachlan Cope
 - "Leader" but left after 6 weeks
 - Shackleton's Ross Sea party, 1914
- Hubert Wilkins
 - Left with Cope
 - Shackleton's Quest party, 1922
 - Became a pioneer of polar aviation
- Thomas Bagshawe
 - Surveyor in his early twenties
 - Elected to stay 1 year
- Maxime Charles Lester
 - Geologist, 19
 - Elected to stay in with Bagshawe



Bagshawe

Lester

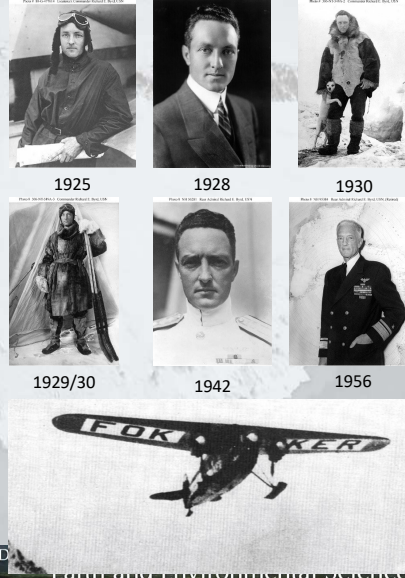
Waterboat point

- <https://www.spri.cam.ac.uk/resources/expeditions/blax/>



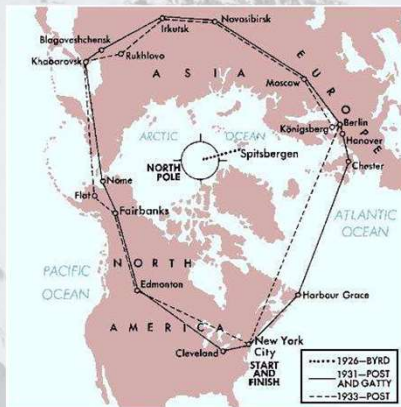
Richard Evelyn Byrd Jr. (1888-1957)

- Prominent Virginia family
- VMI, UVA, USNA ('12)
- Medically retired 1916
- Navy pilot in WWI
- Arctic exploration 1926
 - Claims to fly over north pole with Floyd Bennett

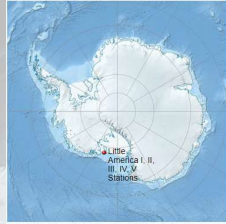


North Pole Flight

- May 9, 1926
- Svalbard -> North Pole -> Svalbard
- Congressional Medal of Honor



Byrd Expeditions



Little America I, 1928



- “Little America” I, II, III
 - 1928-30
 - 1933-35
 - 1939-40: aborted
- On Ross Ice Shelf at Bay of Whales
- Privately funded
- Boy Scouts


The Quest for a Boy Scout

- Byrd announced his intention of taking a Boy Scout on his forthcoming Antarctic Expedition in 1927
- At least two years' Scouting experience with First Class or Able Sea Scout rank
- A certificate from his troop, proving his Scouting abilities
- Have had a least one week's camping or cruising experience every summer over three years
- An essay of between 500 and 1,000 words on why he wished to be a member of the expedition, stating his qualifications

Paul Allman Siple (1908-68)

- Apart from the 21 required merit badges, Siple had earned 38 additional ones.
- He had had five years experience as a Sea Scout and had spent 35 weeks in total under canvas
- Makes 6 Antarctic trips total, 5 with Byrd
- First winter-over at South Pole, 1957
- Develops the “wind chill factor” with Charles Passel



VANDERBILT UNIVERSITY  College of Arts and Science Department of Earth and Environmental Sciences

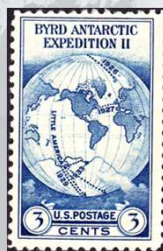
Little America I, 1928-30


<http://library.osu.edu/projects/conquering-the-ice/index.html>



Second Antarctic Expedition

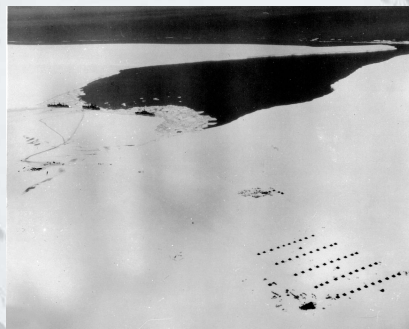
- Winter of 1934, Byrd spends 5 months alone
- Carbon Monoxide poisoning



VANDERBILT UNIVERSITY  College of Arts and Science Department of Earth and Environmental Sciences

Interview with Byrd

- “Admiral Richard E. Byrd warned today that the United States should adopt measures of protection against the possibility of an invasion of the country by hostile planes coming from the polar regions.”
- “I have to warn my compatriots that the time has ended when we were able to take refuge in our isolation and rely on the certainty that the distances, the oceans, and the poles were a guarantee of safety.”



VANDERBILT UNIVERSITY  College of Arts and Science Department of Earth and Environmental Sciences

Operation Highjump 1946-47



- 4700 men, 13 ships, 6 helicopters, 6 flying boats, 2 seaplanes, 15 other aircraft
- Feasibility of Antarctic bases, training, testing
- <https://www.youtube.com/watch?v=E9chz8COYVc>

Operation Deep Freeze (1955-56)

- Navy Seabees (Construction Battalion – CB)
- <https://www.youtube.com/watch?v=uA-1F5NSjsU>
- <https://www.youtube.com/watch?v=dWq1bwTtLN4>
- Continuous US presence



First landing at south pole Oct 31, 1956



Captain Finn Ronne

- Born in December 1899 and died in January 1980
- Father was Martin Ronne, who served on Amundsen's trip to the South Pole
- Emigrated to the U.S. in 1923 and joined the Navy
- Third Antarctic expedition
- Married to Edith Ronne



Feud with Richard E. Byrd

- At the end of WWII, Ronne began to plan his own, independent, Antarctic expedition.
- Approached by friend Admiral Richard E. Byrd to work together on the expedition, leading Ronne to share his expedition plans with him.
- Byrd went on to propose the same plan as Ronne as his own, resulting in competition for funding for Ronne.



Funding

- Although Byrd severely hurt Ronne's expedition plans, Ronne was able to raise about \$50,000 (2021: \$700,000) and gather 22 unpaid volunteers to help him on his journey.
- The Air Force also donated three planes, equipment, spare parts, and clothing.
- Congress loaned Ronne USS *ATA-215*, renamed the *Port of Beaumont* to use for the expedition.
 - 183 foot, 1200 ton, wooden hulled ship

Port of Beaumont



The Crew



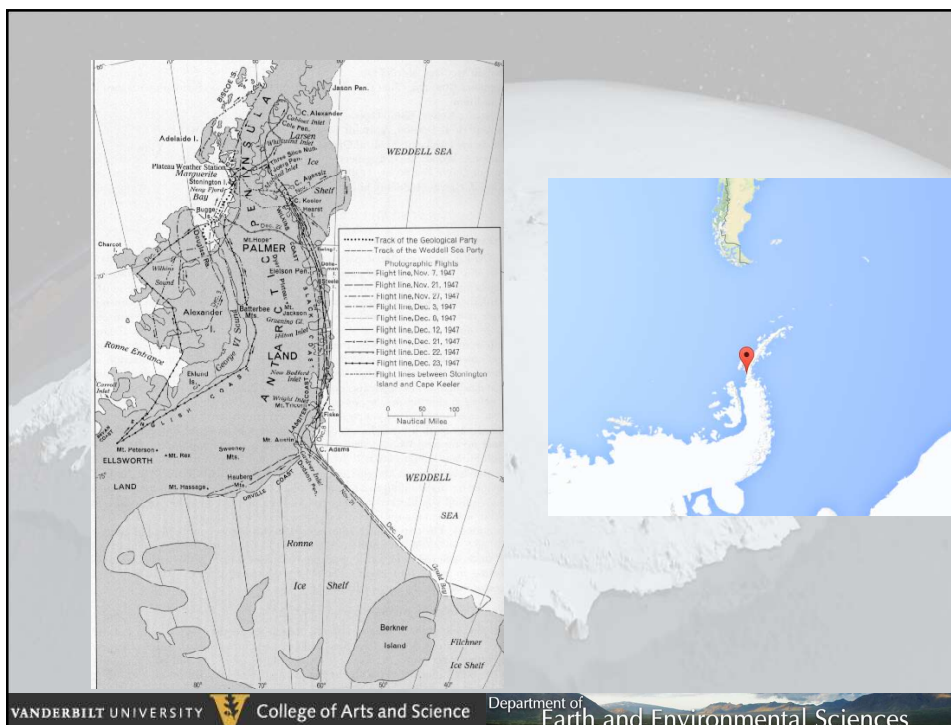
Edith “Jackie” Ronne



- Wife of Commander Finn Ronne
- Documented and kept journals of the expedition
- Mapped the Weddell Sea
- Assisted in experiments
- First woman to spend a year in Antarctica
- The namesake of the Ronne Ice Shelf

The Expedition

- On January 27th, 1947, the Ronne Antarctic Research Expedition departed from Beaumont, Texas
- Arrived In Antarctica in March after making stops in Valparaiso, Chile and Punta Arenas, Chile
- Anchored off of Stonington Island near a British base
- Eventually became good friends with the British there
- Took a few weeks to build huts and transport materials, but by winter, everything had been set up and the ship has been intentionally frozen in



The Expedition

- Spent the majority of the 1947 winter doing geological research, traveling by dogsled, and playing cards and watching movies to pass time
- Potential disaster occurred when Peterson (physicist) fell into a crevasse for 12 hours before being saved, resulting in a furious Finn concerned about not following safety rules.
- Fights ensue between Finn and Harry Darlington, leading to Harry's dismissal as a pilot.
- Once winter had ended, flights began to discover previously unknown land around the Weddell Sea and the now-named Ronne Ice Shelf.



The Expedition

- Ronne and his team were able to map out the Weddell Sea coastline (one of the only unmapped coastlines at the time) and discover that the Weddell Sea and Ross Sea were not connected.
- Back on land, dog teams were created, allowing geologist Nichols to gather rocks and measure solar radiation and atmospheric refraction.
- Nichols broke the record of longest sledging trip (105 days vs. 84 days)
- By February 1948, with gasoline levels low and sea ice beginning to melt, plans were made to go home.



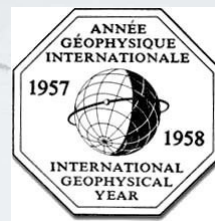
Legacy and Aftermath

- In 346 hours of flight time, RARE was able to take about 14,000 photographs covering 450,000 square miles.
- Determined that Antarctica was one contiguous continent by discovering that the Weddell Sea and Ross Sea are not connected
- Conducted field work in meteorology, geology, and astrophysics
- First women to be among the expedition crew
- Named a significant amount of their discoveries on members of the crew



International Geophysical Year 1957-58

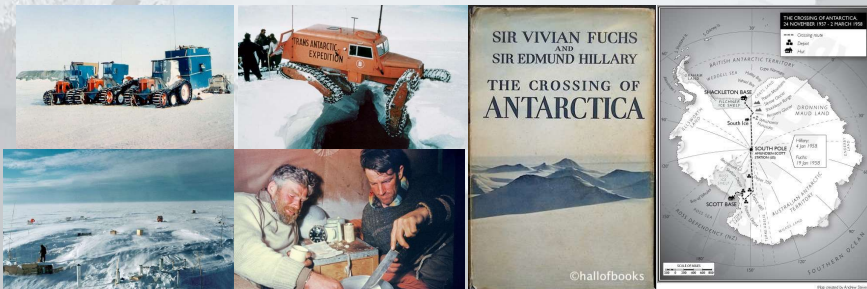
- International Polar Years: 1882-1883, 1932-1933, 2007-2009
- Satellites
- 18 months of Antarctic Science
 - Many bases built
- Antarctic Treaty
- Data collection and preservation



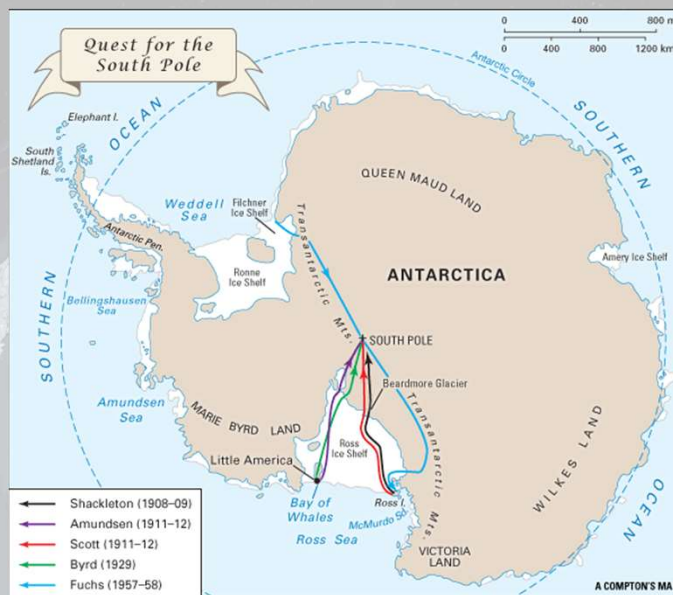
Commonwealth Trans-Antarctic Expedition (1955-58)

<https://www.youtube.com/watch?v=wQ-HmwXBF84>

- First overland crossing via South Pole
- Vivian Fuchs and Edmund Hillary

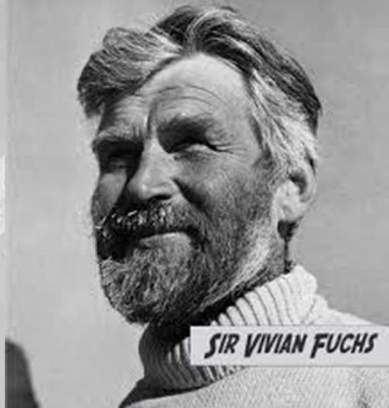


VANDERBILT UNIVERSITY College of Arts and Science Department of Earth and Environmental Sciences



VANDERBILT UNIVERSITY College of Arts and Science Department of Earth and Environmental Sciences

Sir Vivian Fuchs



- Born February 11th, 1908 died November 11th, 1999
- Attended Brighton College, St. John's College, and Cambridge
- First expedition was to Greenland in 1929 with his tutor
- In 1933 married his cousin Joyce Connell who joined him on his next expedition to Lake Turkana in Africa
- At thirty enrolled in the Territorial Army for Britain
- Led team to travel 2,158 miles crossing Antarctica in 100 days
- In 1958 he was knighted by Queen Elizabeth II

Sir Edmund Hillary

- Born July 20th, 1919 died January 11th, 2008
- Studied mathematics and science at Auckland University College
- Made first major climb reaching Mount Ollivier in 1939
- Joined Royal New Zealand Air Force
- Was a navigator during World War II
- Was a professional beekeeper like his father
- In 1953 was the first person to reach the point of Mount Everest
- Led a team in 1958 to Antarctica, first to reach pole since Scott in 1912
- In 1960 searched for the abominable snowman or yeti



Ships

Fuchs ship, Theron (pictured left)- Hillary's ship, Endeavour (Pictured Right)



Commonwealth Trans-Antarctic Expedition



Ranulph Fiennes (1944-)



Early Life

- Born in 1944 – Berkshire, England
- Father died before Ran was born
- Royal Scots Greys – Cold War
- SAS – 1965/66
- Difficulties in military
- Married Ginny Pepper 1970



Virginia Peppers

- 1947-2004
- Childhood sweetheart
- Trained at Royal Aircraft Establishment
- When Ranulph refers to his adventures, he rarely excludes Ginny
- Drove him to be ambitious
- Suggested the transglobal expedition, ran the logistics



Overview of expeditions...

- Title of “World’s greatest living explorer” – 1984 Book of World Records
- 17 Major expeditions
 - 1967: Jostedalbreen Glacier
 - 1969: Nile Hovercraft
 - 1979-82: Transglobe
 - 1986-90: Unsupported North Pole
 - 1992-93: Unsupported Antarctic Continent
 - 2000: Arctic Solo
 - 7 Marathons
 - 2005 and 2008: Everest
 - 2014: Antarctic plateau in polar winter



Transglobe Expedition

- Race against satellites
- Launched on paper in 1973 – 10 year commitment
- 100% sponsored necessary
- Geographical planning took 1 year
- Time factor



The *Benjy B.*



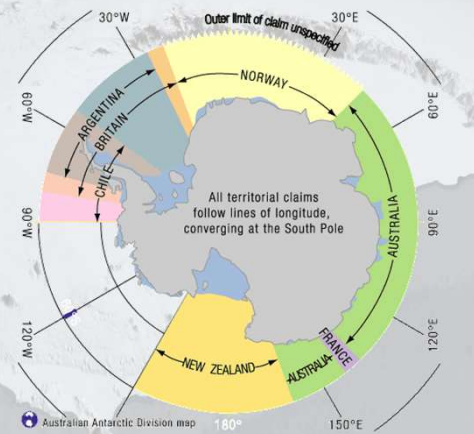
The Transglobe expedition

- Boarded ship in Barcelona, sailed to Algiers
- Land rovers drove them through Sahara, down Niger, and into jungles of Ivory Coast
- Boarded ship again at Abidjan
- The crossing of the continent
- Northwest passage to north pole back to England



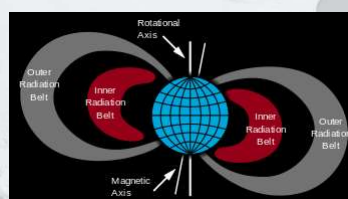
Governance: Who owns Antarctica?

- Many countries claim parts of Antarctica
- Antarctica is governed by treaty
 - “it is in the interest of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord”



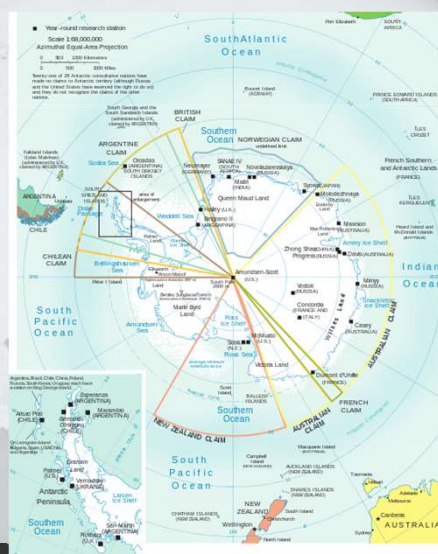
Significance of the International Geophysical Year (IGY)

- Cooperation among 67 countries to study 11 sciences for this 18 month period
- Ended a long period of scientific isolation between the East and West
- Huge scientific success
 - First artificial satellite launch, Sputnik
 - Much more accurate estimate of total ice on earth
 - Van Allen Radiation Belt
 - Mid-ocean submarine ridges
 - Confirmation of tectonic plates
 - Established over 50 Antarctic bases
- International Cooperation
 - Sharing of scientific findings
 - Led to Antarctic Treaty System



Antarctic Treaty

- <http://www.nsf.gov/od/opp/antarct/anttrty.jsp>
- http://www.ats.aq/index_e.htm
- Written in 1959, signed in 1961
- Now 50 signatory countries
- First nuclear treaty signed
- Premier example of international cooperation
- 10% of Earth is designated for scientific and peaceful purposes



Antarctic Treaty

- Article I: Antarctica for peaceful purposes only
 - No measures of military nature
- Article II: freedom of scientific investigation to continue
 - In spirit of IGY
- Article III: plans and results to be exchanged
- Article IV: territorial claims
 - No asserting, supporting, denying claims
- Article V: nuclear explosions prohibited, no radioactive waste
- Article VI: area covered by Treaty
 - Area south of 60°S, but not high seas
- Article VII: free access for observation and inspection
- Article VIII: personnel under jurisdiction of their own states
- Article IX: Treaty states to meet periodically
- Article X: discourages activities contrary to Treaty
- Article XI: settlement of disputes
- Article XII: review of Treaty possible after 30 years
- Article XIII: ratification and accession
 - Any member of UN can join
- Article XIV: United States is repository



Secretariat of the Antarctic Treaty
 Secrétariat du Traité sur l'Antarctique
 Секретариат Договора об Антарктике
 Secretaria del Tratado Antártico

VANDERBILT UNIVERSITY College of Arts and Science Department of Earth and Environmental Sciences

Antarctic Treaty – Other agreements



- Agreed Measures for the Conservation of Antarctic Fauna and Flora (1964)
- Convention for the Conservation of Antarctic Seals (1972)
- Antarctic Conservation Act (1978): US law
- Convention on the Conservation of Antarctic Marine Living Resources (1980)
- Protocol on Environmental Protection (1991)



Secretariat of the Antarctic Treaty
 Secrétariat du Traité sur l'Antarctique
 Секретариат Договора об Антарктике
 Secretaria del Tratado Antártico

VANDERBILT UNIVERSITY College of Arts and Science Department of Earth and Environmental Sciences

Polar Geospatial Center

- <https://www.pgc.umn.edu/data/>
- Aerial photograph data: <https://www.arcgis.com/home/webmap/viewer.html?webmap=c435036b150843428d5413fb7260ef2>

