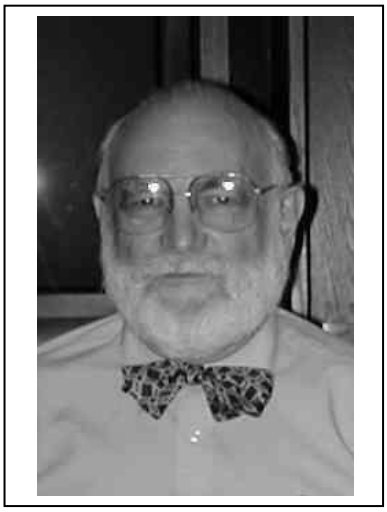
3.4 Richard Cameron



Dr. Richard Cameron is currently an adjunct professor at Webster University in St. Louis, Missouri.

While completing his undergraduate studies at the University of New Hampshire (B.Sc. in Geology, 1954), Dr. Cameron spent the summer of 1953 at the Summer School at the University of Oslo where he had the opportunity of taking a course on Norway in the Polar Regions with Dr. H. U. Sverdrup, a student of the noted polar explorer Fridtjof Nansen. After the course, he worked with the Norwegian Polar Institute on glaciers in the Jotunheim. Following graduation, he worked with Dr. Valter Schytt (chief glaciologist of the Norwegian-British-Swedish Antarctic Expedition) first in Greenland in the summer of 1954 and then during 1955 at the University of Stockholm.

Dr. Cameron joined the Arctic Institute of North America in 1956 to participate in IGY-related activities in Antarctica. He served as Chief Glaciologist at Wilkes Station, on the coast of East Antarctica. This was a joint Navy-civilian operation consisting of 17 Navy personnel and 10 scientists. Specifically, his glaciological team consisted of two colleagues with whom he had worked before – Olav Loken in Norway in the summer of 1953, and John Molholm in Greenland in the summer of 1954. This team spent much of its time at a remote station established 80 kilometers (50 miles) inland, where they conducted both meteorological and glaciological studies. One of the glaciological studies entailed digging a 35-meter (~115-foot) vertical pit to study snow densification and stratigraphy.

After completing his doctoral course studies at The Ohio State University in 1961, he accepted the position of Chief of the Geotechnics Branch, Terrestrial Sciences Lab, Air Force Cambridge Laboratories. He returned to Ohio State University in 1963 to finish his dissertation and receive his degree. He then served in a number of positions at the University - Assistant to the Director of the Institute of Polar Studies, Associate Director of The Ohio State University Research Foundation, Assistant Dean of University College, and Assistant Dean of International Programs. In 1973, Dr. Cameron joined the National Science Foundation first as Associate Program Manager and then Program Manager of International Organizations, Division of International Programs. He then moved to the Division of Polar Programs where he was the Program Manager for Glaciology from 1975 to 1985. In this last position he acted as the NSF Representative at South Pole Station at the beginning of each summer. He would go in on the first flight, usually on November 1, with the replacement crew and spend a month or more to monitor how the new crew was doing. Now and then it was necessary to replace a crew member who was not adequate to handle the job assigned or not emotionally stable enough to spend the whole winter.

Dr. Cameron, has been conducting a number of study tour programs for Webster University during the last few years – Glacier Studies in Austria in 1999, Physical Geography of the Netherlands in 2000 and 2001, and Fire and Ice (glaciology and volcanology) in the Pacific Northwest in 2001.

A4 – Presentation of Richard L. Cameron

Short Trips and a Traverse

[Slide 2] AT THE EDGE OF THE ICESHEET – WILKES STATION 1957

The assignment for the Navy Seabees was to first establish a joint US-NZ base at Cape Hallett and then go along the coast of East Antarctica and set up Wilkes Station. However, delays caused by the need to stop work at Hallett and deliver tractors to McMurdo as a tractor and operator (Willy) went through the sea ice and then again at Hallett a pinching of the ARNEB by sea ice being forced against the ship by high winds and the subsequent requirement of Admiral Dufek to inspect the ship (he was in McMurdo).

[Slide 3] Three ships finally headed to Wilkes, the icebreaker GLACIER, and two cargo ships, the ARNEB and the GREENVILLE VICTORY. [Slide 4] En route there was heavy sea ice and [Slide 5] large tabular bergs. The arrival date was 29 January 1957 and by 16 February the station had been built and the ships left. The site was Clark Peninsula in the Windmill Islands a group of Precambrian outcrops attached to the ice sheet by ice ramps. [Slide 6] The station could experience fine weather or [Slide 7] bad weather with strong katabatic winds.

[Slide 8] The station had dual leadership with Lt. Burnett and Dr. Carl Eklund (shown in slide). Eklund had been in the Antarctic in 1940 with Finn Ronne when they sledged over 1264 miles in 84 days and mapped 500 miles of coastline of the Antarctic Peninsula. The station consisted of 17 Navy personnel and 10 IGY scientists. Throughout the year there was good morale but of course the isolation was easier on the scientists as their work became more interesting as the year wore on and the Navy men became bored with the tedium of their respective chores.

[Slide 9] At Wilkes we had three forms of transportation; dog team, [Slide 10] Weasel, and [Slide 11] a raft with outboard motor. [Slide 12] Inland of the station the ice sheet gained in elevation rapidly and had a firm surface with no crevasses en route to where [Slide 13-14] we built a small station called S-2 for glaciological work. Here we dug a snow pit 115 feet deep to study the snow stratigraphy and the depth/density profile.

[Slide 15] To the south of Wilkes a large glacier flowed into Vincennes Bay. [Slides 16-19] It was a 25-mile journey with Weasels and we spent many days there measuring the movement of the glacier which was 2.7 meters per day. [Slide 20-21] To the north of the Windmill Islands the ice sheet exhibited a beautiful ice front terminating in the sea. However, in the winter the fast ice made a lovely highway where one could travel along quite swiftly. It was tempting to explore this area. The first time we ventured forth on this sea ice the weather turn bad with high katabatic winds coming off the ice front so we retreated to the safety of the station. The next morning all the sea ice was gone. We waited several weeks and the sea ice reformed.

[Slide 22] This time we traveled 75 miles to Cape Poinsett. There were some cracks in this meter thick sea ice, [Slide 23] so we put 2x10 boards down and drove across. [Slide 24] Along the way we would stop for a quick lunch. [Slide 25] At one spot we ran across a spectacular sight and that is where the ice front calved tossing sea ice blocks all about. [Slide 26] In this shot one can see the bottom of the iceberg and its very smooth surface and a few boulders. [Slide 27] A large piece of sea ice sits upon an iceberg and in the distance one can see the blocks of sea ice spread out on the fast ice. So at Wilkes we had short trips inland to S-2, to the Vanderford Glacier, and to Cape Poinsett.

The Weasels were a very good form of transportation for the glaciologist but now and then they broke down. Once we were stranded at the Vanderford as the vehicle refused to run and our communications were poor. After 3 days the base sent out a group to find us. We were three men for 3 days in a two-man tent. I froze my feet and they were numb for several months. Another time we had two weasels out at S-2 and neither would start. As there was a D-4 tractor 20 miles away on the Station to S-2 trail the mechanic and I walked the 20 miles and thank goodness the tractor started.

The only real incident at the station was when the ET [electronics technician] Chief Charlton was going through the chow line and the cook Daniels place some chicken on his tray. Charlton threw it back saying he was tired of chicken and that is when Daniels decked him. You must realize that Daniels was cooking for 27 men, three times a day, month after month. He was doing the best he could. He lost his temper and a stripe.

[Slide 28] TO THE INTERIOR OF THE ICE SHEET – QMLT -1964-65

[Slide 29] The first of the South Pole Queen Maud Land Traverses began in December of 1964. There would be two more: 1965-1966 and 1967-1968. The traverse equipment consisted of two large 841 Tucker Snocats, one 742 Tucker Snocat equipped with a drilling unit, two rolligons (which are large wheeled trailers whose tires can hold 500 gallons of fuel each), and four sleds. There were ten personnel – geophysicists, glaciologists, meteorologist, navigator and mechanics. [Slide 30] The traverse began at South Pole Station on 4 December 1964 and traveled in a zigzag route to the Pole of Relative Inaccessibility in 54 days. Travel speed was about 5 miles per hour. There were 180 gravity stations, 29 seismic stations for vertical reflection and a few seismic stations for wide-angle reflection, short refraction and long refraction. There were 29 glaciological stations. [Slide 31] Recorded on the traverse were geophysical data, [Slide 32] glaciological data, and [Slide 33] meteorological data.

[Slide 34] The United States Antarctic Program was emblazoned on the side of the 841 to discourage passersby from stealing the vehicle. [Slide 35] The whole traverse hardware is shown is this shot. [Slide 36] A good view of the rolligon. [Slide 37] The glaciologist is ever digging snow pits and here is Dr. Picciotto doing just that. [Slide 38] The determination of annual accumulation by stratigraphy is very difficult in this part of Antarctica where the accumulation is so low. Note the uneven layers and eroded areas. The accumulation was obtained by measuring the amount of snow above the Castle Nuclear bomb fallout. Accumulation values on the traverse ranged from 6.7 to 3.6 grams per square centimeter per year.

[Slide 39] The surface condition of the ice sheet varied from smooth and soft to [Slide 40] hard and rough. [Slide 41] Sastrugi were sometimes difficult to cross as some were over a meter high.

[Slide 42] Here we have a photo of one of the units of the traverse – the 841, a rolligon , and a sled.

[Slide 43] The interior of the 841 had bunks for 6 people, work space, a kitchen, and table for meals.

[Slide 44] Not all personnel could be seated at once but there was always someone off making measurements or making some necessary repairs.

[Slide 45] Halfway through the traverse additional fuel was needed and drums of diesel were parachuted to us. The red parachute was for the spare parts and mail. This refueling was quite a job as the pallets punched holes in the snow and one had to get in with the barrels and hand pump the fuel to the rolligon tires or directly into a vehicle. [Slide 46] The crew hauls in the mail and spare parts on a banana sled past some tents. Inside the vehicles it was quite warm and so for comfortable sleeping many preferred a tent.

[Slide 47] The 742 had the drill rig with which we were able to drill to a depth of 40 meters. These holes were used by the glaciologists for density and temperature measurements and then the geophysicists utilized them as shot holes for their seismic work. [Slide 48] Drilling of these holes was one of the coldest tasks on the traverse as can be attested by this driller. [Slide 49] Of course another cold tasks is pictured here where by the time you have your pants back up man was they have been filled by drifting snow.

[Slide 50] The Pole of Relative Inaccessibility (Elevation 3718 meters) was reached on January 28, 1965. Note the statue of Lenin atop the drilling tower. After such a long trip a little play was necessary so the navigator is sighting his theodolite on the centerfold of a *Playboy* magazine. The snow accumulation in central East Antarctica is low. [Slide 51] Here the glaciologist is measuring the depth from the surface to the base of the weather shelter placed by the Russians in 1958. The accumulation rate calculated was 3.6 grams per square centimeter per year. [Slide 52] The air temperatures during the traverse ranged from -18.2 to -44.7 degrees Centigrade. [Slide 53] The late Dr. Edgard Picciotto was the geochemist-glaciologist who pioneered the use of radioactive fallout for determining snow accumulation.

This was a successful traverse with a considerable amount of scientific data obtained and with no injuries to the members. One chap became ill with a troublesome cough indicative of a serious upper respiratory problem and as we would receive only one C-130 flight where there would be a landing, I requested a replacement for him and the sick man was flown out. I was concerned about pneumonia and at these high elevations it can be fatal. Upon arriving at the Pole of Relative Inaccessibility I became sick and got down on my hands and knees and vomited. I believe this was a combination of being over tired and I am not too good a high elevations. After these few moments I was okay.

The vehicles were prepared for the winter and would remain there for the next season's team to carry on with Queen Maud Land Traverse 2.

Short Trips and a Traverse

Dick Cameron

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At the Edge of the Ice Sheet

Wilkes Station

1957

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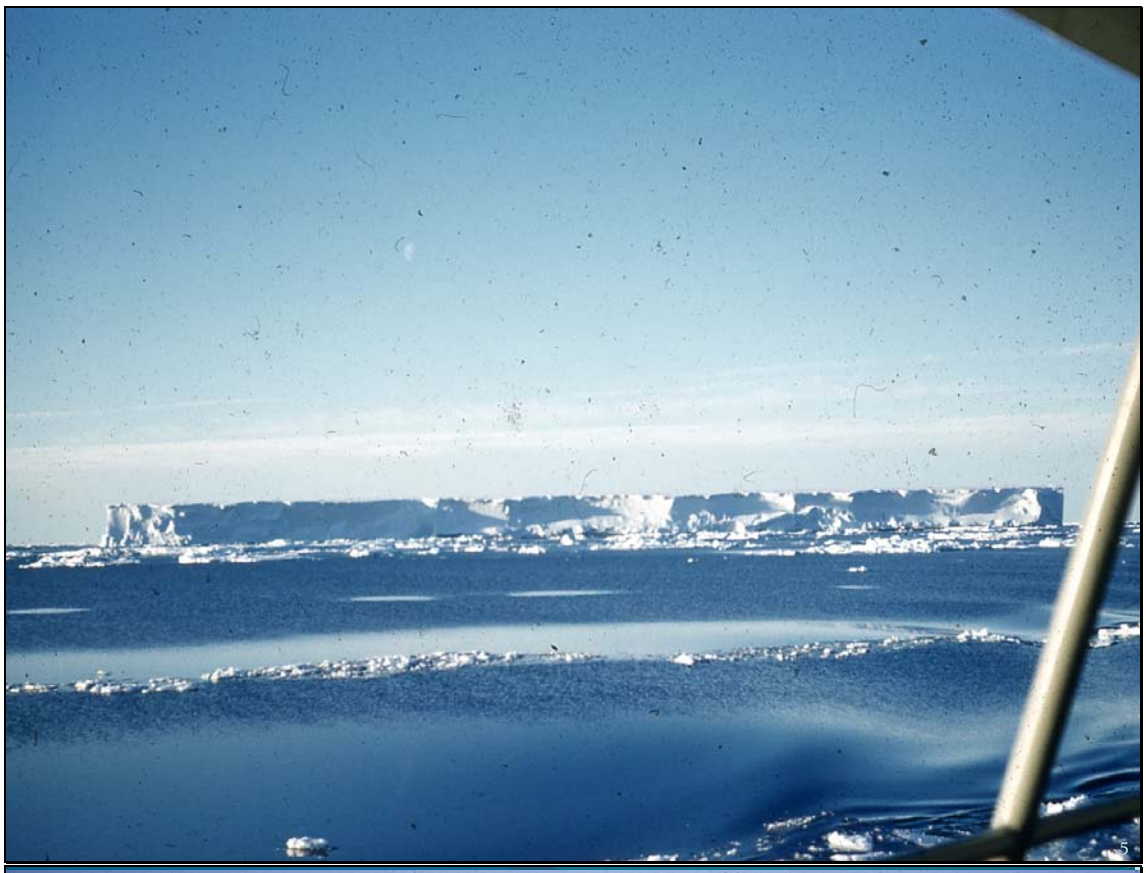
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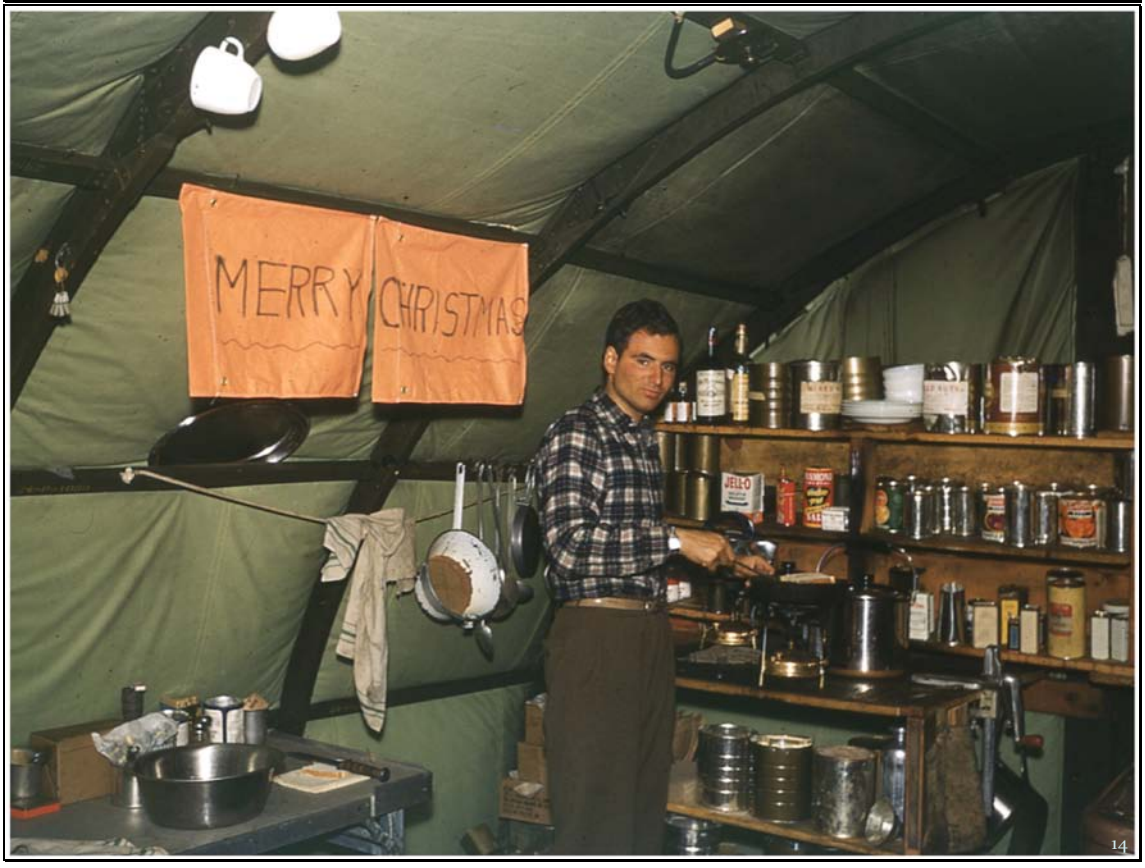
MERRY CHRISTMAS
JELL-O
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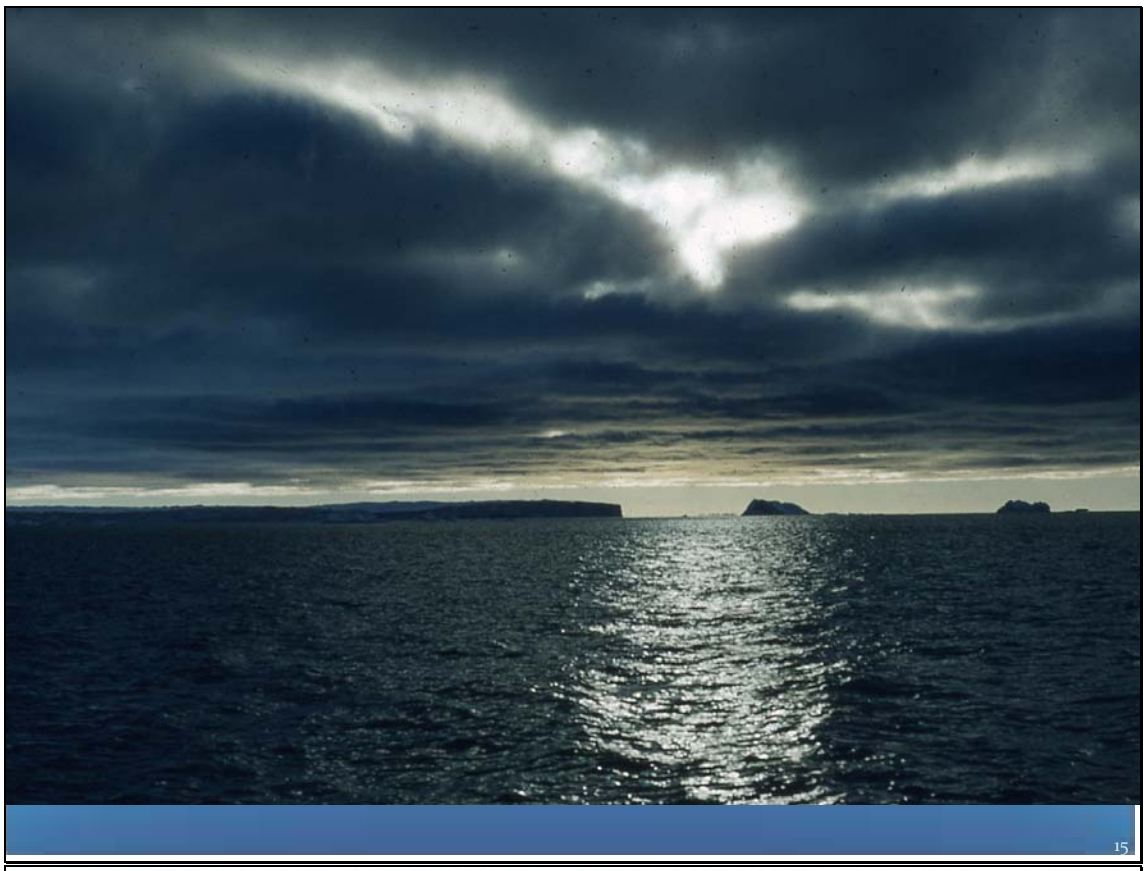

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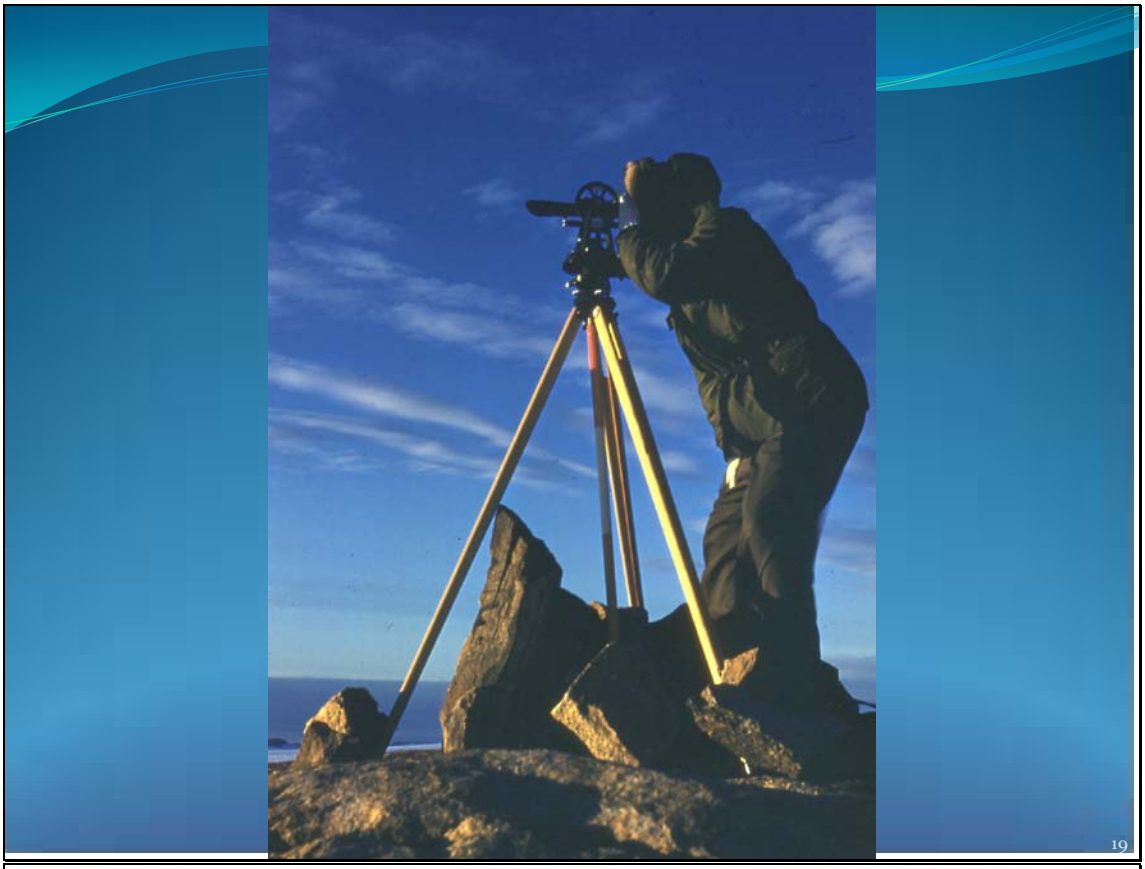
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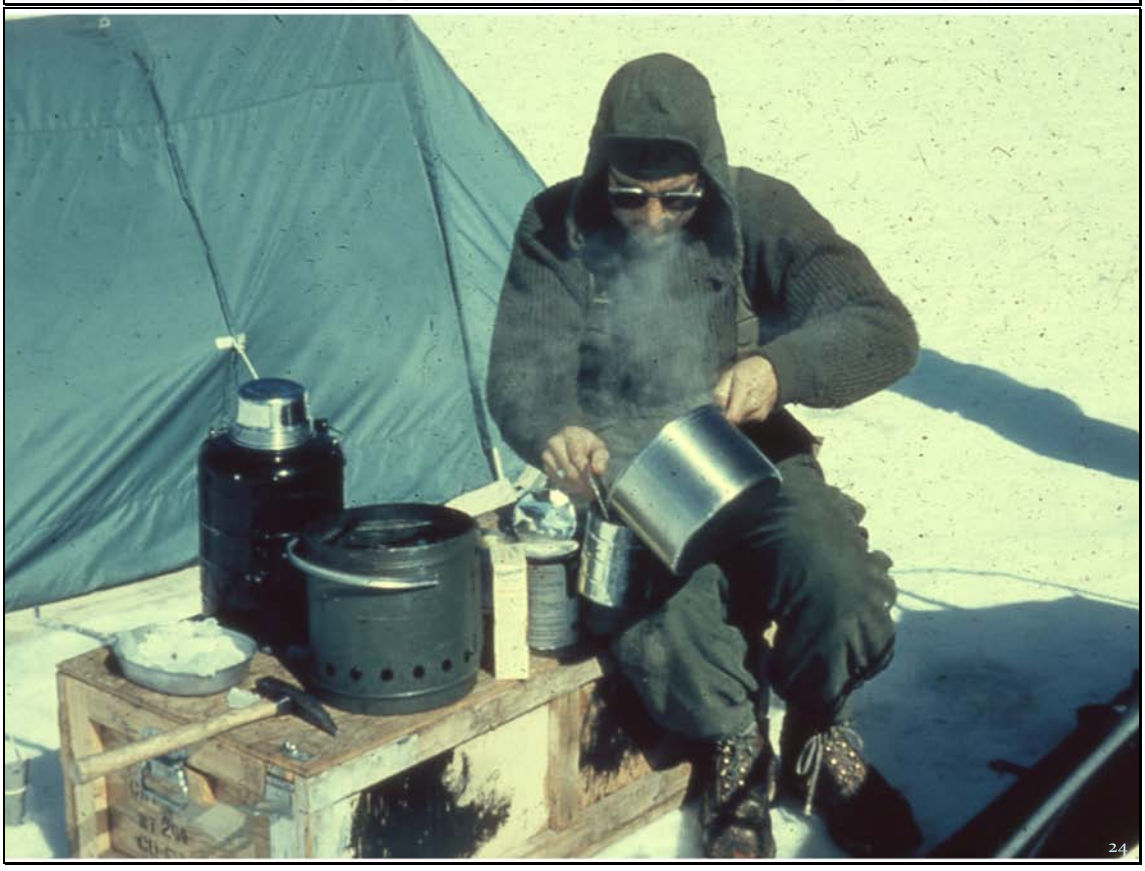

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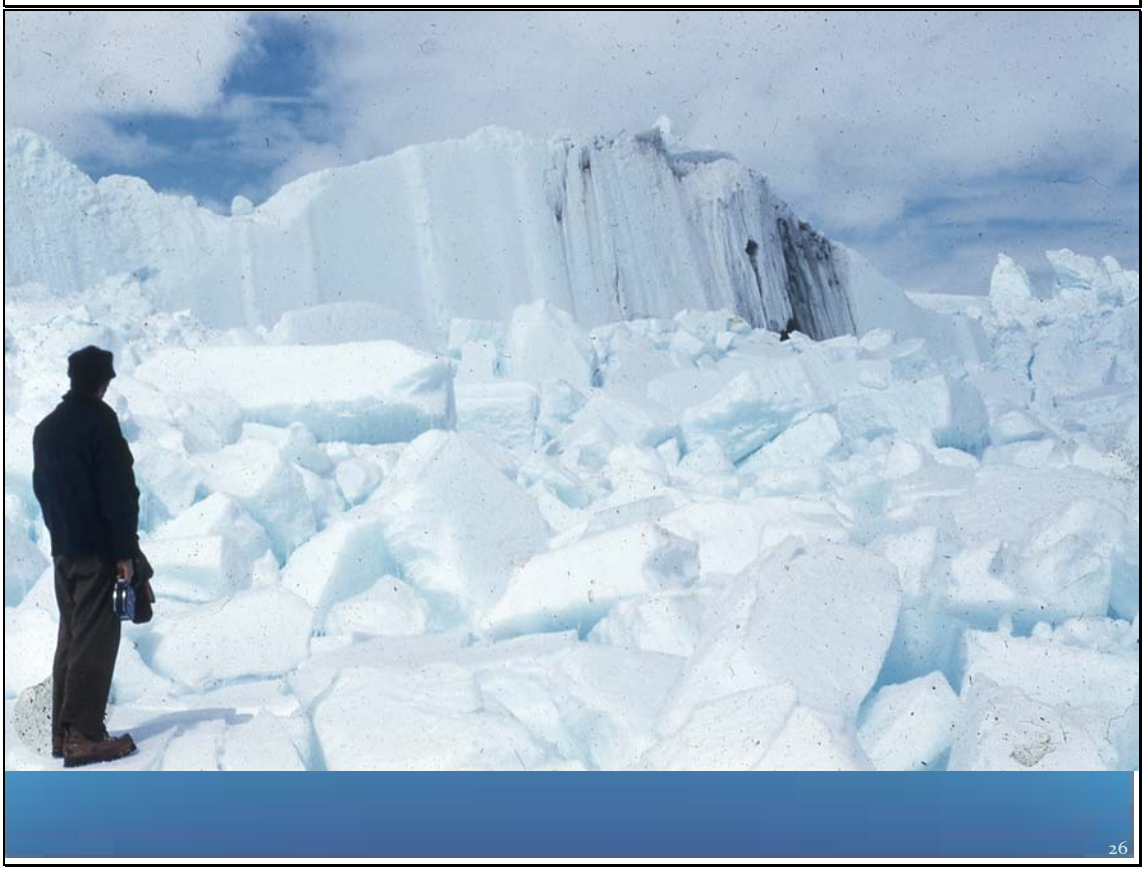

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To the Interior of the Ice Sheet

Q M L T

1964-1965


UNITED STATES
OF
AMERICA
USARP
SOUTH POLE

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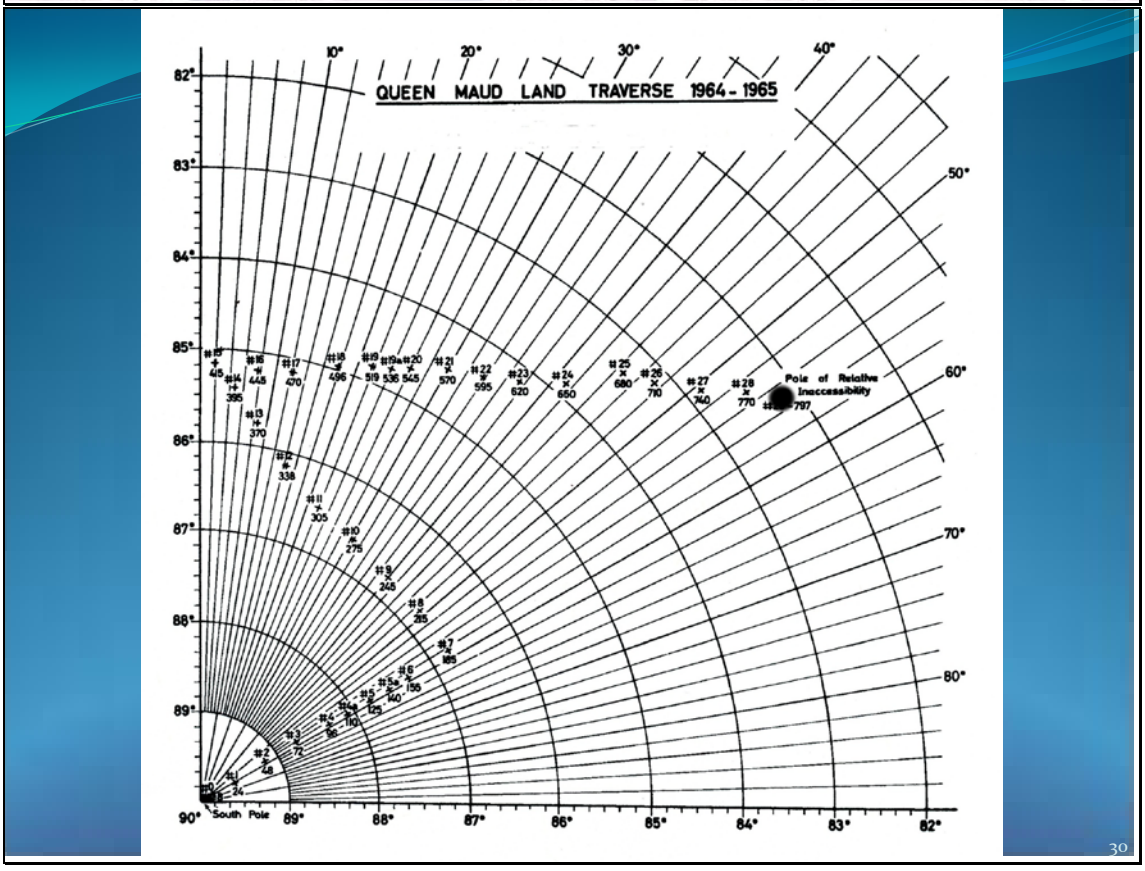
QUEEN MAUD LAND TRAVERSE 1964 - 1965
10°
20°
30°
40°
50°
60°
70°
80°
82°
83°
84°
85°
86°
87°
88°
89°
90° South Pole
89°
88°
87°
86°
85°
84°
83°
82°
Pole of Relative Inaccessibility
#1 24
#2 48
#3 72
#4 96
#5 125
#6 156
#7 189
#8 215
#9 245
#10 275
#11 305
#12 338
#13 370
#14 395
#15 415
#16 448
#17 470
#18 496
#19 519
#19a 536
#20 545
#21 570
#22 595
#23 620
#24 650
#25 680
#26 710
#27 740
#28 770
797

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Recorded on Traverse

Geophysical Data

- Surface Elevation – Altimeters
- Ice Thickness
  - Seismic
  - Gravity
- Magnetics
- Nature of Upper Crustal Layers
  - Seismic Long Refraction

31

Glaciological Data

- Snow Accumulation
  - Stratigraphy
  - Nuclear Test Debris Horizon 1954
    - (using ^{240} Pb Unstable Isotope Method)
- Depth/Density Curve to 40 Meters
- Mean Annual Air Temperature
  - 10 - Meter Temperature

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Meteorological Data

- Temperature
- Wind
- Cloud Cover
- Visibility
- Solar Halos

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U.S. ANTARCTIC
RESEARCH PROGRAM
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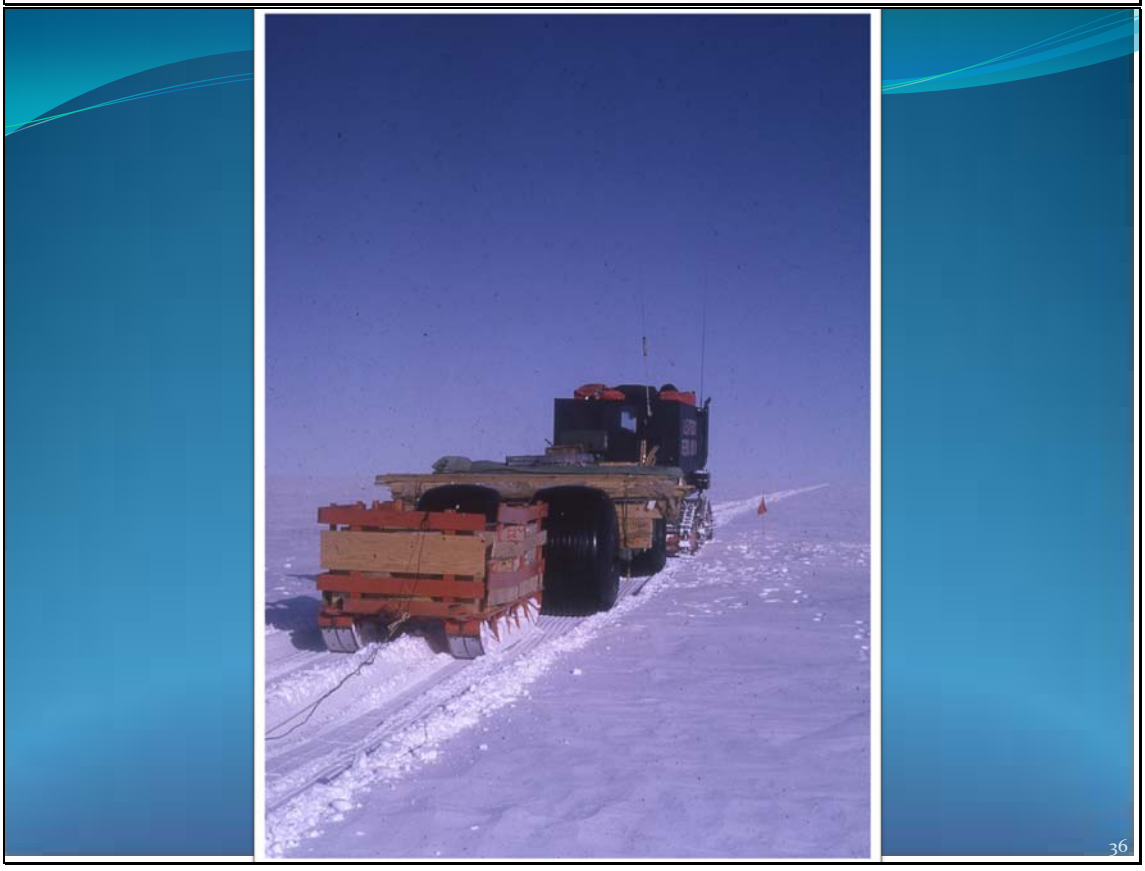
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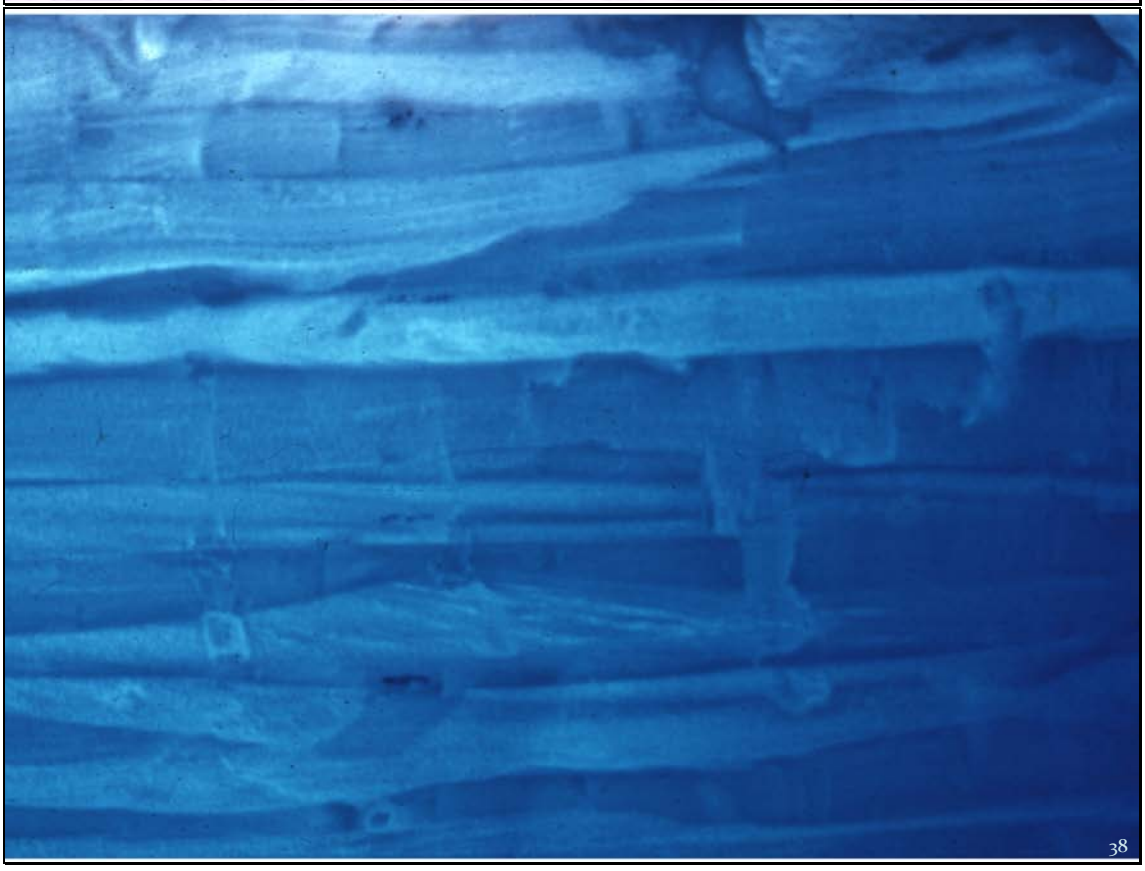
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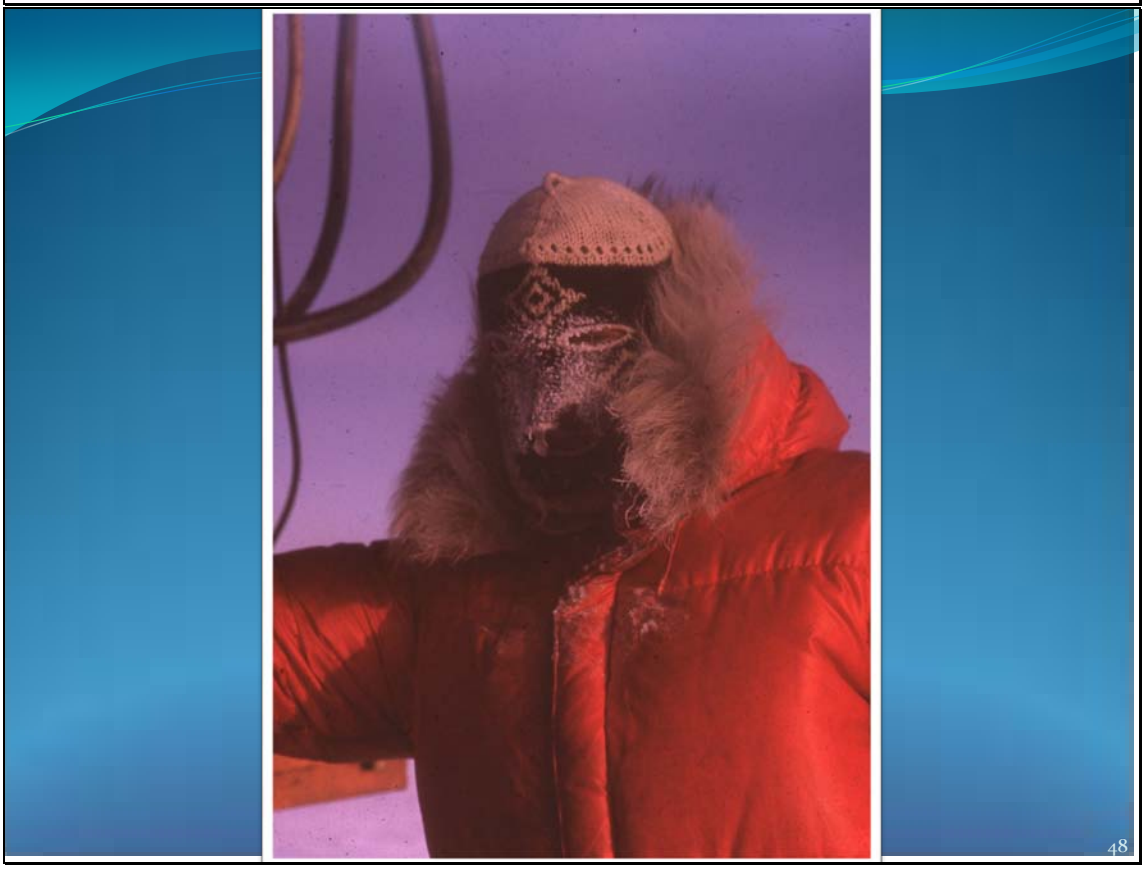
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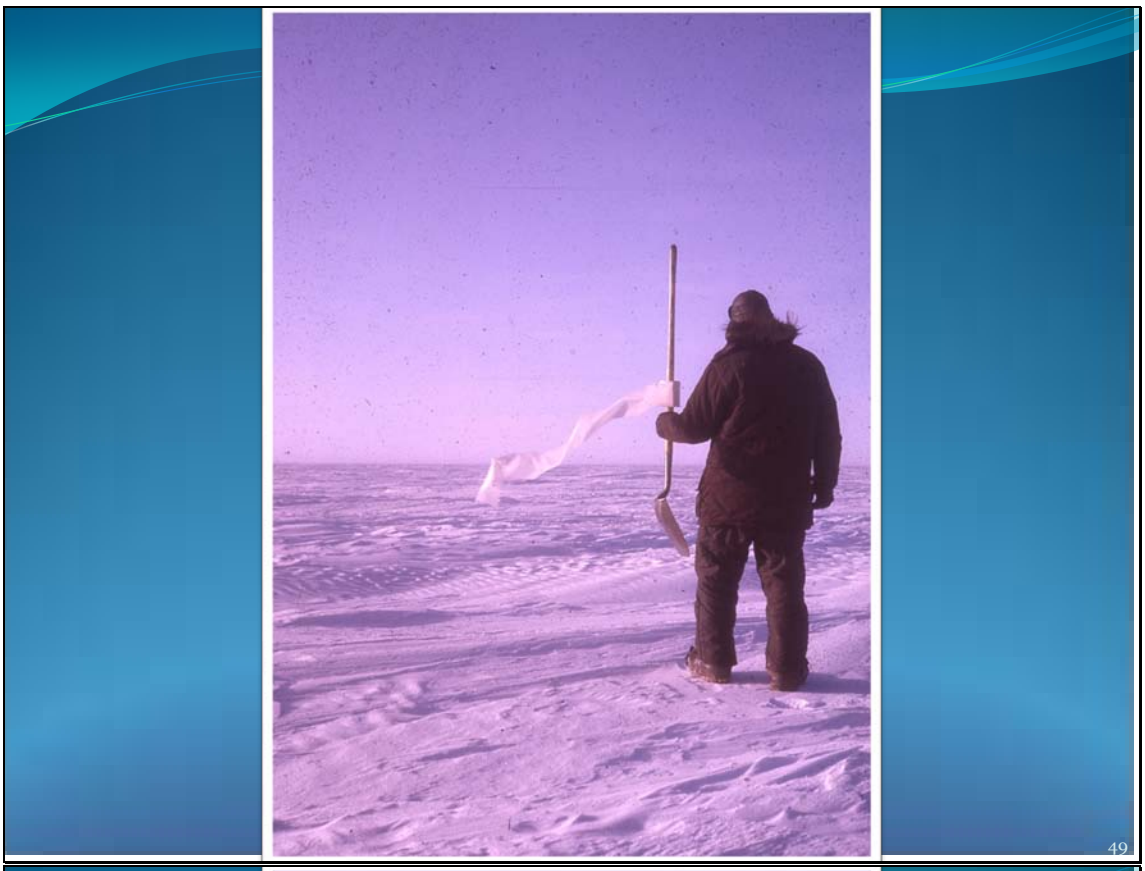
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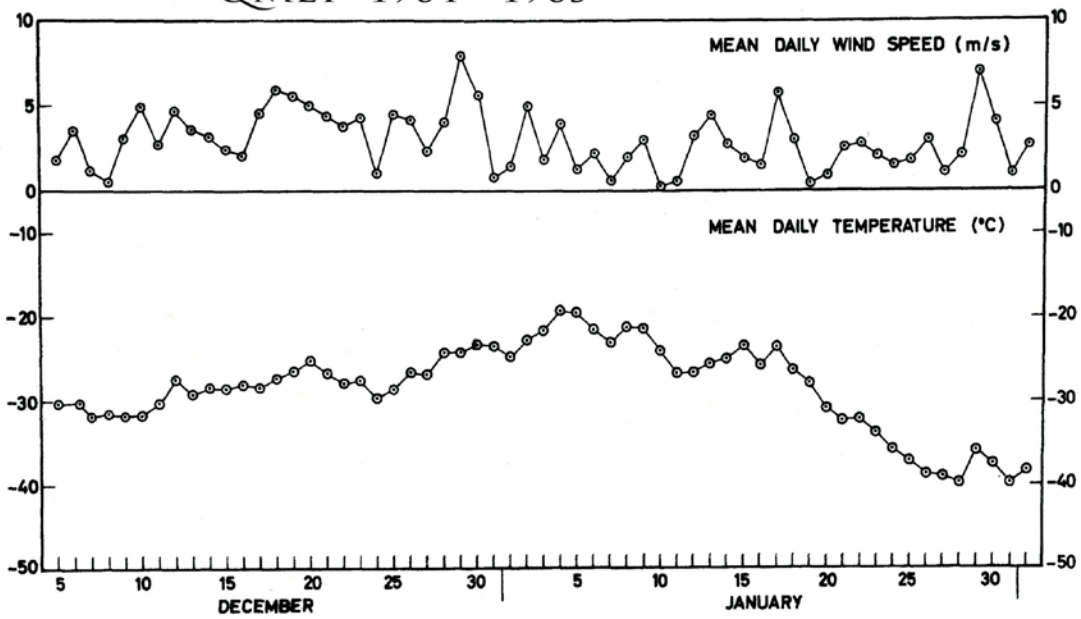
QMLT 1964 - 1965



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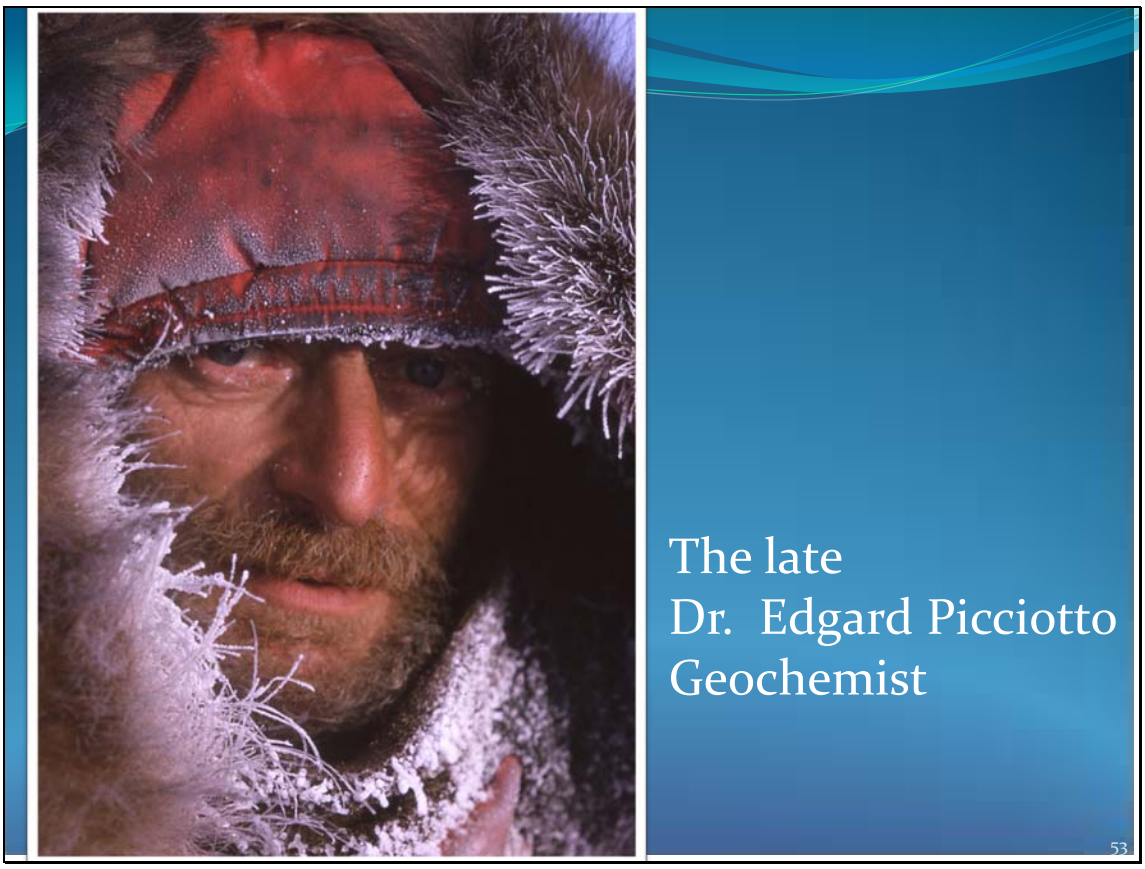
The late
Dr. Edgard Picciotto
Geochemist
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