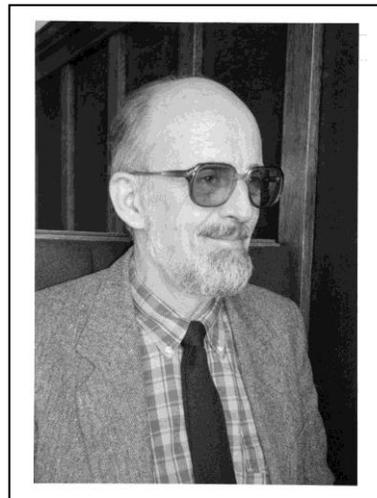


3.2 Charles Bentley

Dr Charles Bentley is the A.P. Crary Professor Emeritus of Geophysics, Department of Geology and Geophysics, University of Wisconsin-Madison.

Dr. Bentley joined the Arctic Institute of North America in 1956 to participate in International Geophysical Year (IGY)-related activities in the Antarctic. He wintered over consecutively in 1957 and 1958 at Byrd Station, a station in the interior of West Antarctica that housed 24 men each winter – 12 Navy support people and 12 civilian scientists/technicians. During the austral summers, he also participated in over-snow traverses, first as co-leader, then leader (the other co-leader went home after the first year). These traverses consisted of six men and three vehicles, and lasted several months. These traverses covered more than 1609 kilometers (1000 miles) of largely unmapped and unphotographed terrain. During these traverses, connections to Byrd Station were by radio (daily, when the transmission conditions were good enough) and roughly every 2 weeks by resupply flight.



Dr. Bentley received a B.S. in physics from Yale University in 1950 and a Ph.D. in geophysics from Columbia University in 1959. During his career in the Department of Geology and Geophysics at the University of Wisconsin-Madison (1959 – 1987), he held academic positions ranging from Project Associate through Professor, and finally as A.P. Crary Professor of Geophysics. Among a variety of other activities, he has been a member of the Polar Research Board, National Research Council (NRC) (1978-1997, chairman 1981-1985), as well as a U.S. member (1981-1997) and vice president (1990-1994) of the Scientific Committee for Antarctic Research (SCAR), International Council of Science (ICS). Dr. Bentley has received many awards from American, British, and Russian organizations for his outstanding contribution to the glaciological and geophysical studies of the Polar Regions. Among these awards are the Goldthwait Medal from the Byrd Polar Research Center, the Ohio State University; the Seligman Crystal from the International Glaciological Society; and the Bellingshausen-Lazarev Medal from the Soviet Academy of Sciences.

A3 – Presentation of Charles R. Bentley

My IGY in Antarctica

[Slide 1] To put my remarks in context I'm going to use as a framework a brief travelogue of my IGY Antarctic years.

[Slide 2] We start in New Zealand, on board our southbound ship, the Pvt. Joseph F. Merrell. Pictured here are Bentley, Ostensio, Morency, and Anderson.

[Slide 3] Travel to Antarctica: In those days access was only by ship; WWII Victory ship, thin-skinned, icebreaker escort, wait until mid-summer for sea ice to break up; to have a full field season must go in the year before and winter over. This is still the routine for countries without Antarctic air facilities. KA56 is the Arneb, one of the logistics ships.

[Slide 4-5] After several days we reach the Ross Sea, where we encounter sea ice, and are joined by an icebreaker (GB3 is the USS Atka) to help us get through.

[Slide 6] USS Atka and another icebreaker out front, then probably the USS Arneb and for sure the USNS Pvt. John R. Towle, taken from on board USNS Pvt. Joseph F. Merrell. Both Towle and Merrell were Medal of Honor recipients for actions against the Germans after the invasion of Europe.

[Slide 7] We move eastward through the Ross Sea to the vicinity of Admiral Byrd's latest Little America Station, where we discharge our cargo at a low spot in the Ross Ice Shelf edge that had already been scouted out.

[Slide 8] Little America is a typical IGY station – buildings, cargo dump, Weasels. In the foreground are Bert Crary and George Toney

[Slide 9-10] We are not slated to stay here so we collect our vehicles; 3 Tucker Sno-Cats, gasoline powered, 4-track drive, all pontoons turn, cab over engine for warm access to latter – also keeps cab warm – so warm, in fact, that often we have to drive with open windows and doors to cool off; several K lb drawbar capacity. Benches inside for instruments and sleeping; cooking; and scientific equipment. Aneroid altimeters, exploration seismic gear, gravity meter, magnetometer, rammsonde, snow density gear, radios for inter-Cat and traverse-to-base communication, navigational equipment.

[Slide 11] We set out for Byrd Station in the West Antarctic interior, 640 miles away following a marked trail.

[Slide 12] We met Maj. Merle (Skip) Dawson leader of the Army-Navy Trail Party on his way back to LAS in his Weasel. At Mile 280.

The types of measurements to be made were laid out by the IGY Glaciology Panel in Washington when they decided what instruments to provide for the program, but we had a lot of leeway in deciding our experiments and the actual design of the traverse operations.

Traverse routine: travel one Cat ahead then other two 5 miles behind for differential altimetry. We stopped every 5 miles for altimeter, gravity, magnetic readings, rammsonde every 20 miles; alternate days traveling, then day on site for seismic work and pit studies. Some conflict over cooking at first because

nobody considered it his job. It was to be the job of the original mechanic, but the man we had was a late substitute for the original man and the new man had not agreed to be cook, but eventually worked out a routine. Mogas drums cached for us every 50 miles.

Danger in traveling with light tailwind enveloped in own exhaust – CO poisoning

Food: some good, newly developed dehydrated items, but with the Sno-Cats we had plenty of hauling capacity so we carried mostly full-weight frozen items – steaks, etc.

After almost a month of travel, we arrive at Byrd Station.

[Slide 13] (This was actually taken in November, 1957, at the start of Sentinel Traverse, 1957-58. Shown here are Dan Hale sitting on sign, then standing, Bentley, Jack Long, Ostenso; kneeling, Norbert Helfert, sitting, Anderson.)

[Slide 14-6] Byrd Station was still a work in progress when we arrived; buildings were still going up as the construction was delayed by long time needed to find route through Fashion Lane to get to Byrd Station location. These pictures show the modular construction of Clements hut. Scientists help with construction. Not everything needed arrived before last flight (by R4D), so some improvising was required; e.g., missing non-magnetic panels. We did have an ample supply of real essentials, like food; diesel fuel for heating, electric power generation, and running big Caterpillar; mogas

[Slide 17] The last piece of construction was the aurora tower. After it is finally built, we settle in for the long winter ahead.

[Slide 18] Russ Greenwood shoveling snow into the snow melter. The snow melter used excess heat from diesel generators. Every man expected to replace water he used; e.g., for shower, clothes washer

Most men at Byrd Station, including all the members of the traverse party, were young, just in their twenties. Half were civilians and half were Navy SeaBees – 12 of each. And we were all men – women wouldn't be allowed on the continent in the U.S. program for more than a decade. The station leadership was split: the chief scientist, in charge of the scientists, and the officer in charge of the SeaBees (who was also the doctor) shared the responsibility evenly. It worked well both winters because of character of the leaders. The only real leadership problem in IGY was at a station where one man was leader of both groups (Ellsworth Station; Finn Ronne). That also was a matter of the character of the leader.

[Slide 19] Primary activities during winter: working on data (geophysicists), digging a deep snow pit to study the record of past snowfalls (glaciologists) and preparing for summer's traverse.

[Slide 20] There was plenty to do to keep us from getting bored. We taught ourselves celestial navigation and sending Morse code; built a kitchen wannigan; and calculated sled loads. During the latter, we realized we had ample capacity so loaded up on frozen class A rations.

[Slide 21] We occasionally used the ham radio to talk to the folks back home. (Here I am with Steve Barnes, making a call during winter 1958.) During the next year, we had proper equipment and our connections were much better. This was an important morale booster in absence of any other connection home.

[Slide 22] Here we are enjoying the company of some new mid-winter arrivals.

[Slide 23] The Second winter was plush compared with first. New recreation building w/ ping-pong and [Slide 24] pool tables, exercise area (Judo class), [Slide 25] good beer supply, roster included Navy Chief to help out Officer-in-Charge/doctor.

[Slide 26] While there was still light, we got some work done outside. Here, Ostenso and Anderson, with a theodolite.

[Slide 27-28] Clothing. The first slide shows some of the special clothing supplied: down parka & pants, Byrd cloth windproofs, dog-skin mitts, caribou-skin boots, full facemask, bear paw mitts; second shows much better parka hood, much better nose-&-cheek mask. [Slide 28] But the standard summer wear was as shown (Bentley, Bill Long, Le Schack, Anderson, Jack Long, Ostenso) – Korean War vintage Army issue (field jacket, field pants, parka, all with removable liners), plus down vest (not Army issue), personal hat (most men had personal items – sense of variation from uniform probably important). Bear paws still issued, but the best mitts for working when it was too cold for leather gloves with inserts were the leather "chopper" mitts (see previous Slide 19).

[Slide 29] After months of darkness, the sun finally rises again, [Slide 30] showing us our Sno-Cats buried in snow, outside and [Slide 31] inside. So after, lots of digging, [Slide 32] and some preparatory barbering, [Slide 33] we were ready to go.

The Kitchen wannigan was a huge improvement over cooking in Sno-Cats. The gyrocompasses we were supplied with for finding the vehicle headings were insufficiently damped for travel over the rough, hard snow surface – they swung wildly and were useless. Fortunately, someone dug up an Army vehicle (tank) magnetic compass, which worked nicely. It saved the day!

The traverse routine was the same as before except no trail to follow, no fuel caches. One cat led, 3 miles ahead of the other two. We alternated travel and station days with a few several-day stops for more extended work – seismic refraction, [Slide 34] deeper pits. Cooking was shared, except I did all breakfasts so I could wake everybody. I think others appreciated it that I was first up and (usually) last to go to bed. Carried enough mogas for about 150 miles, and then needed a resupply flight. We waited several days for the first one, but thereafter the Navy pilots were eager to fly out to us.

Navigation was by sun shots – we taught ourselves over the winter. At first the Navy navigators tried to tell us where we were, but they soon realized that sunshots from solid ground with a theodolite were more accurate than sextant shots from a moving aircraft.

[Slide 35] Resupply flights (here an R4D taking off with JATO assist) brought out fresh bread, sometimes some veggies and fruit and mail – an important morale factor. The cook at Byrd Station, while an excellent cook, was a bit of a sourpuss who thought our several unsuccessful attempts to start off on our traverse (due to the gyrocompass problem) were our deliberate efforts to f___ up his meal planning. When he sent out a couple of pies on a re-supply flight we thought he had forgiven us until we bit into them and found them thoroughly laced with red pepper!

[Slide 36] On the traverse to the Sentinel Range, 500 miles to the east. Traverse route was generally planned to be a northeast loop to Mt Ullmer (north end of Sentinel Range, the main part of which was previously unseen). We were free to alter our route according to what we found, and we did, [Slide 37] first at Mt Takahe and [Slide 38] then at Sentinel Mts.

[Slide 39] Safety: the electrical crevasse detector worked well only at low travel speeds – at our cruising speed of 7 mph it bounced too much over the sastrugi to see any crevasse signals so we made a decision early on to traverse without its protection. I was under the ignorant expectation that there would be no crevasses in the WAIS interior. We left the crevasse detector mounted (but turned off) anyway because it was a good sastrugi detector when traveling in poor lighting conditions.

[Slide 40] The weather was mostly good, although we encountered some windy days.

[Slide 41] We learned how to be prepared; e.g., parking Sno-Cats and sleds so the wind didn't catch the doors and drifting was minimized, picking up all seismic cables right away after shooting, etc.

A final personal note: I was originally scheduled to stay over just one winter. Sometime during that winter the call came for volunteers to extend a year. I jumped at the chance because I was so interested, as a geophysicist/glaciologist, in our surprising findings and I thought IGY would end and I would never have another chance. I was never sorry I did so, even after I found out that the Antarctic research program was continuing.

My IGY in Antarctica



Charles R. Bentley

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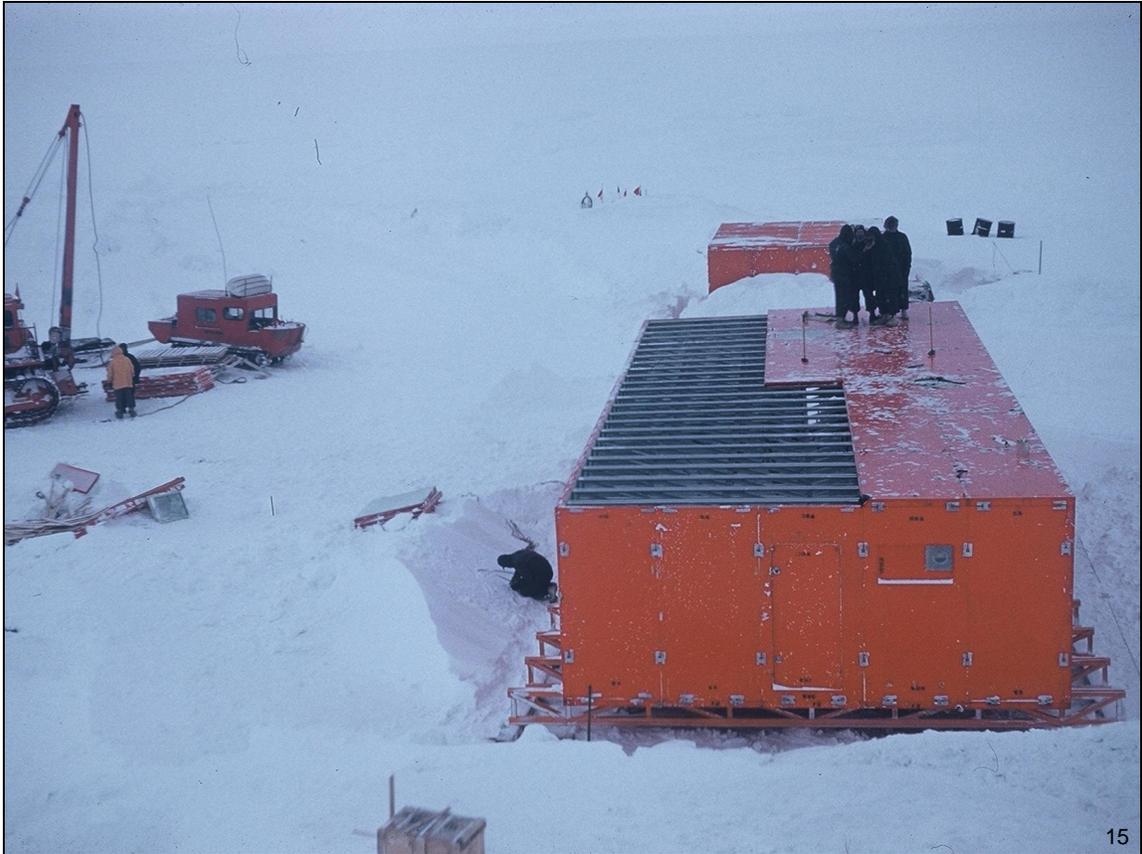




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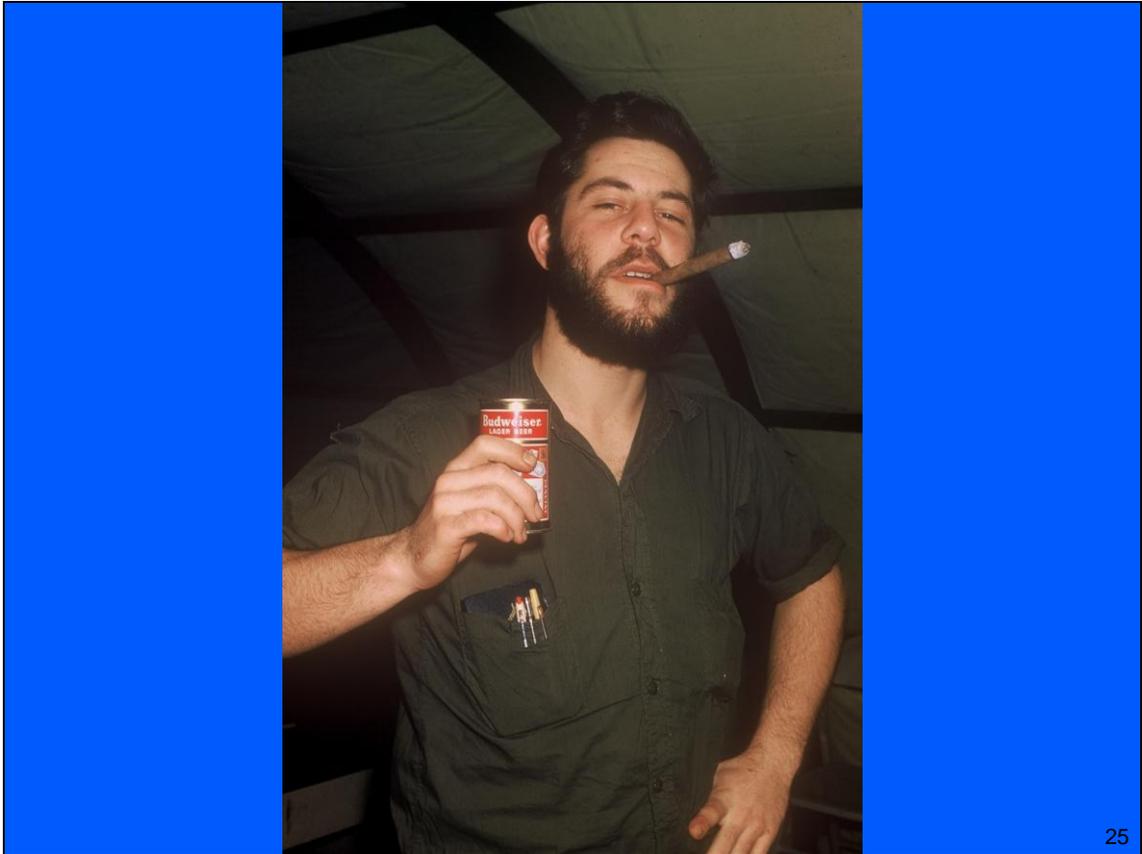
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