Q. This is Henry Brecher of the Ohio State University Byrd Polar Research Center. This is taking place on December 28, 1999. The interviewer is Raimund Goerler and the place is the Ohio State University Archives in Columbus, Ohio. This interview is one of several being sponsored by the National Science Foundation. The title of the grant sponsored by the National Science Foundation is “Talking Science and Exploration, Preserving the American Heritage of Polar History Through Oral Interviews.” Henry, can you discuss for the tape how you became a scientist, more specifically your influences, college education, early career?

A. Yea, sure. And as I wanted to point out and as I had before we started taping, I don’t really consider myself a scientist now and never really have. I’d say I can be classified as an engineer still, probably, in other words, I’ve never done original research driven by my own scientific interest. I’ve done a lot of technical stuff for other people basically. But I became an engineer basically because I was good at science and math in high school. And so the conventional thing and advice I got was that I should think about engineering as a career and I also enjoyed playing with tools and all this stuff. So that seemed like a logical progression. So my education in engineering is what led to the Antarctic experience indirectly. And I did a bachelor’s in mechanical engineering at
Rensselaer Polytechnic Institute in 1955 and then I did a couple years service in the military because I was an ROTC graduate. And after that, I went to work as an engineer at Pratt and Whitney Aircraft Corporation, one of the few big jet engine makers in the United States. And I was a development test engineer and I was working there for close to a year and liked it less and less and looking for something more interesting to do. And that’s what led into going to Antarctica eventually. I think there’s another question that you were asking about background that led me to decide.

Q. Was there any study of particular significance at Rensselaer Polytechnical? Why did you go there in the first place? And you joined the ROTC, were you in the Air Force?

A. Right. There was no one at Rensselaer, this was undergraduate stuff and you know in general you don’t worry about who you are going to study under until you’re a graduate student usually. The reason I went to Rensselaer is basically because it was a very good engineering school, one of the top ones in the country, even though no one has ever heard of it. It always takes second place to MIT, of course. Not necessarily number two, but down the list. But I applied four places, MIT, Lehigh, Swarthmore College, and RPI. I got accepted at all of them and I picked RPI over MIT, basically for two reasons. One, there were a couple of guys from my boarding school a year ahead of me who were going to school there. And the other thing was that it was in a small town and a relatively small school and I guess wisely, because of my boarding school being small, I was a little bit scared about going to a big city like Boston or Cambridge. And getting into a
very high pressure kind of large environment. And that’s why I decided on RPI. And the other thing was I was living in New York City, RPI is 150 miles up the Hudson River. I had gone to school in Poughkeepsie which is halfway. So part of it may have been that, but there was no specific person at RPI. I don’t remember anyone as being terribly influential. And in fact, about halfway through at RPI I was getting fairly dissatisfied with the place. I guess I wasn’t doing very well. In high school, I was a world beater, it was way too easy for me. When I got to RPI I had competition. I was doing alright, I was passing, no problem, but I wasn’t doing extremely well and I began to wonder about engineering in general and thought maybe I would have done better by going to a place like Swarthmore which no one knows in fact has an engineering school. It is so well known as a liberal arts school, but it has a very small engineering school. And I even thought about transferring and then I didn’t do it. As far as ROTC, this was during the Korean war and those of us who were in college could either get a deferment and then be drafted, presumably drafted at the end of your college career or the other way to avoid doing your military service at the time and interrupting your education, was the ROTC. I nosed around and we had all three, Army, Navy, Air Force and the Navy program was very selective and hard to get into. The Army and Air Force were much more willing to take any warm body that came along. And I went in the Air Force, I guess, I don’t really remember any concrete reason except I suspect it appealed to me more to think about flying than being a grunt. In fact, when I first went into the ROTC, I was not yet a US citizen and there was some problem with that. But I expected to have my citizenship before I
graduated. Of course, you couldn’t get commissioned until you were a citizen. And I did in fact become a citizen somewhere halfway through college. Because I remember going to Albany to be sworn in as a citizen and then I was commissioned in ROTC. And somewhere along the line the demand for pilots became strong and again, just like the Antarctic, I had never really thought about flying in particular, but when they decided to make a big push for people to sign up for pilot training, I thought that sounds like kind of a fun thing to do. So I signed up for pilot training. This is getting very far from the Antarctic track, but if you want me to continue down this path, I will.

Q. Let’s talk about what you were doing at Pratt and Whitney.

A. Okay. Well, after my inglorious 2 ½ year military career, I had to find a job. And I don’t really remember how I got to Pratt and Whitney, in fact, or why I picked Pratt and Whitney. But I did anyway. I was in a development test section. The organization was broken down into design area and test area and then in the test area at least, and I assume in the rest of the company, things were broken down by parts of the engine that were being built. And so we had a small section headed by a senior man. I think there were three of us engineers in it that worried about testing burner cans of jet engines. And that meant getting a design from the design department and working out a test schedule, taking the part out to the operator. We had test cells with a lot of plumbing and so on, a technician who ran whatever testing was required. And so the junior engineer supervised the test and then we’d come back and evaluate the results and say we need to modify this thing this way or that, different pattern of holes in the burner cans. We also tested the
nozzles, the fuel nozzles that feed the fuel into the burner cans. And it was actually quite interesting technically. At that date, this was in 1957 I guess, DC8s, and 707s were just starting to fly and one feature was water injection for take-offs. I don’t know if you remember but the 707s used to spew this terrible black smoke on take off. And that was actually carbon particles that were being spewed out by the engine. The reason for the water injection was just to supply more mass which gave you more thrust on take-off. Also, it cooled the engine. But these carbon particles were hell on the engine because they were literally eroding the turbine blade shrouds and so we did some testing about how to modify burner nozzles to cure that problem. We had little filters to collect the particles and all this stuff. The engines that were being supplied commercially were direct derivatives of the military engines that they were building. Two engines, J57 and J75. And they were also working on, I can’t remember which engine, as an auxiliary power plant for two things. One, for pumping on gas pipe lines and so they were modifying the engines to use natural gas as a fuel as opposed to petroleum, jet fuel. And the other one was they were supplying these as standby generator capacity for electric utilities. So we were doing things like designing nozzles to accept these new fuels and for the engine to operate in a stationary mode rather than in an airplane. So when you look at the program as a technical activity, it was pretty interesting. But what I didn’t like was the factory atmosphere for one thing and I think what bothered me the most was having to deal with the foremen in the experimental shops, where here you were as some junior kid telling this guy who has been there for 30 years what needed to be done
and most of the time they were resentful. You always had to sort of butter them up and plead with them instead of telling them I want this done because that’s technically what we want. No, we don’t drill holes this way, we do it this way. Silly kid who is wet behind the ears doesn’t know what he is talking about. And that kind of situation bothered me. And just in general, it was too much of a routine, 8-5 office work. I might mention one other thing just as an aside I suppose. In rotation, maybe once every two weeks or so, engineers would get assigned, junior engineers, to some completely unrelated test program where they needed 24 hour a day coverage, some things were running constantly, so you got assigned on an evening shift. You would get assigned to some giant test cell, where they were testing a whole engine running some kind of a pre-cooked program and here you were thrown into this thing, supposedly in charge and responsible if something happened. You were the guy that got called. But you didn’t know diddly squat about what you were doing and I was so overwhelmed in this situation. But basically it was a question of boredom with the situation, that made me look for something different to do with myself.

Q. We talked about how you became a scientist in Antarctica.

A. In that situation, a fellow across the desk from me was taking night classes at Trinity College in Hartford. And one day after lunch he mentioned that he’d seen an announcement on a bulletin board, some organization was looking for people to go to Antarctica. And that’s about all he knew and he had an address. And so I thought this sounds interesting. So he gave me the address, I wrote away and it was Air Force Cambridge Research Labs at Hanscom Field in Bedford,
Massachusetts, just outside of Boston. And it turned out they were looking for four people as aurora observers for the then existing polar stations that were being run in Antarctica by the US program. This was post-IGY; after the IGY in ‘57–‘58, the government decided to continue to run the Antarctic program. And polar stations were in need of aurora observers for the 1960 year. In other words, November ’59 to November ’60, which is the normal turnover time. And I wrote away and said who I am, what my background was and I understood they were looking for people to go to Antarctica. It’s about all I knew. And they had originally specified physicists and if not physicists electrical engineers. And the man from Hanscom Field came around and interviewed both the fellow across the desk from me and myself, and we were both mechanical engineers. And lo and behold in the end, they hired us both. And out of the four people that wound up in training for the program, two of us were mechanical engineers and both from Pratt and Whitney! The other two guys were both physicists. So it was obvious that they were in desperate need of anybody who had a technical background and that’s why I got hired. We went through probably two months training program to learn what’s an aurora, we were sort of almost on that level, what the program was all about and the specifics of what we had to do. And it was quite interesting. We had offices at Hanscom Field and it still is the Air Force geophysics establishment and it turns out that the Air Force geophysics establishment ran the actual nuts and bolts of the program and re-supplied stations, did the training of the people and so on. But the actual science was supervised by a man at Cornell whose name unfortunately I can’t recall at the moment. And we were, as an
administrative arrangement, we were actually hired by the Arctic Institute of North America, which at that time was heavily involved in the Antarctic program in a number of ways, and particularly they supplied, they worried about all the civilian logistics, clothing issues, vehicles, so they hired people for traverses and mechanics and this kind of thing. So it was just a convenience arrangement that we were employees of the Arctic Institute of North America. It was back when American Geographical Society still existed and Arctic Institute was closely tied to them. A man named Walter Wood, who was very well known as an Arctic type in the second world war and after the big muckety muck in the American Geographical Society and was a man of independent means. He was sort of nominally in charge because he was president of the Arctic Institute and he was the man in charge, closely associated with AGS. I met him at the American Geographical Society. Now why I went there I can’t even remember. But I don’t know why this comes in my mind just now because it’s kind of irrelevant to the Antarctic. But he also happened to have been one of the pioneers in the Yukon on the Icefield Ranges and started the Arctic Institute program on the Icefield Ranges which eventually wound up having quite a close connection with OSU’s Institute of Polar Studies seven years later when I was doing a master’s in geodetic science. So let’s see we’re getting off the path again. We were working essentially for the Air Force. The only thing we did for Arctic Institute was submit our expense accounts and we got our checks from Arctic Institute. We were technically employed by the Arctic Institute, but the direction of the program was by the Air Force. Or I guess I started to say about the training. The
four of us lived together in an apartment over an abandoned Howard Johnson’s at Walden Pond, overlooking Walden Pond in fact. And we traveled together through all the training that we did. We went out to the astronomical observatory, Yerkes, at University of Chicago to get some training and I still haven’t looked up the name of the place. I should have done that but I plain forgot. So we did some training up there. Most of it was there at Air Force Cambridge at Hanscom Field. There’s one minor point that I just noticed here that I wrote down, is we were given opportunity to request assignment for the four stations that were being manned, one being Hallett which was the closest place to New Zealand in the Antarctic. Which at that time was a joint US-New Zealand winter over station. The second one was the station at the South Pole. The third was Ellsworth station over on the South American side. And the last was Byrd station, which is up on the West Antarctic plateau, 80 south, 120 west. At that time I had an uncle living in Buenos Aires and so I thought it would be kind of fun for me to get assigned to Ellsworth, because it would mean travelling through South America and it would be my big opportunity to go visit this uncle whom I hadn’t seen since I was a little kid. And in the end, for some reason, the fellow with me, the other mechanical engineer that they hired, his name was George Mick by the way, who was a Latvian or an Estonian or something like that, immigrant, two of us, well actually three of us. The third fellow was a Japanese American. I think he may have been an immigrant. And one native American. Anyway, it was kind of a competition between Mick and me about who was going to go to Ellsworth because at that point the Argentines were getting involved and apparently George convinced the
powers that his Spanish was better than mine and so he got Ellsworth and I didn’t complain, but if I had been given my first choice it would have been Ellsworth. And then it turned out that year (that place was resupplied and remanned by ship and not by air) they couldn’t get into Ellsworth that year because of the ice conditions, so George Mick wound up going all the way down on a ship and back home and never did have an Antarctic experience. Never wintered over in Antarctica. So had I been sent to Ellsworth, I suspect I would not be here today doing this interview. Because I think I would have gone home and who knows what might have transpired. So in the end I was assigned to Byrd. And Mark Gordon who was the American, the physicist who was at Hallett, and Henry Morozumi, the Japanese, went to the South Pole.

Q. Can you describe what you were doing at Byrd Station?

A. I was the aurora observer and the program consisted, I guess you could say of three parts. There were two instruments to run and a visual program to do. The one instrument was a photometer which measured light intensity in the aurora and it recorded on 16 millimeter film, on this special kind. The second instrument was called an all sky camera, which is simply a spherical mirror with a hole in it pointed upward at the sky and then a flat mirror about a foot, foot and a half, above it. And a Kodak 16 millimeter amateur movie camera underneath the spherical mirror, looking through the hole at the plane mirror and photographing what this spherical mirror saw on this so-called all sky camera. That is photographing from horizon to horizon 360 degrees. And so the job with the two instruments was basically load the cameras and develop the film, look at the film
and make some notes about it, keep things organized. And the third part of the program was visual observing. Incidentally, the aurora program worked out of the so-called aurora tower, which was one of the few things above the surface at these stations. It was on four legs, maybe 10-15 feet of clearance between the surface and the bottom of the aurora tower, which was not actually a tower at all, but a rectangular box. Size of your office here maybe. That was the only place to walk around. And then there’s a shaft down into the station that was the access. And on top of the aurora tower there were a couple of Plexiglas bubbles, one of them was for the observer to look out in the winter. And all this stuff had been there when I got there for two years, two full seasons. The station had been set up in the IGY and there was wiring all over the place and half the stuff worked and half didn’t. The instruments were sort of limping along a lot of the time and the spectrograph caused problems the whole year. The all sky camera, we had three or four spare 16 millimeter movie cameras to stick in it. When I first got there, the first thing was to refurbish all this stuff and make sure everything was running for the summer. And there were some modifications that were required to be made. The other thing was resupply, packing, unpacking I should say, the resupply of photo chemicals, whatever, lots of components for the equipment. And so it was the job was maintaining the equipment in running condition, trying to fix things when they broke down, developing the film. But by far the most onerous part of the program was the visual observing because you were required to do a visual observation every half hour. And when there were two different programs, there were special world days I believe they were called, which were
predetermined randomly, observed every 15 minutes and then there were alerts when there were magnetic storms and then you were observing every 15 minutes. And that got old. I mean aurora is spectacular. We saw some fantastic displays and Byrd was the prime location in fact for aurora activity in the Antarctic. That was one reason it was located where it was because of its relation to the aurora belt. And so the stuff is wonderful to watch, impressive, beautiful. But if you’re doing it as a job and have to climb into your tower every 15 minutes to have a look, it gets old. And of course the other thing is that aurora is only seen when the sky is dark enough to see them. And of course being at 80 degrees south, we had daylight from mid October to mid March probably. Something like that. So, when I got there in November until it started to get dark, I was not doing any observing at all. I had plenty of time to fool around with other things. And besides the stuff that I mentioned, getting things ship shape for the coming season, making the modifications, unpacking stuff, I had a lot of free time, so I used that time to do other things. But in the winter, I theoretically should have been observing 24 hours a day. But of course I had to sleep. And the arrangement was that we recruited volunteers among the station crew to observe while you were sleeping. And the observations were on Greenwich time, but we kept US west coast time, which was the appropriate time for the longitude that we were at. So I would start observing at 4:00 in the afternoon local time and observe until breakfast the next morning. After 4:00 I had the evening meal and I would observe all night, have breakfast and quit about 8:00 in the morning and the volunteers went from 8:00 to 4:00.
Q. During these observations, were you taking notes or what were you doing?

A. Yea, the visual observations required you to record what you saw at the time that you took the observation. And it was just a system of coded IBM cards. So you just blacken the appropriate slot on a punch card and collect the cards. If there were something unusual, I would try to write that down. But I didn’t keep a running account or log or anything. It was mostly just routine identifying, and we had been taught the various shapes of these things that they are classified into. Colors, motion, which way did it come from, where did it go to, how far above the horizon was it. I had a little alidade to measure the elevation angle. But we didn’t always make a specific measurement. It’s interesting that I recruited people, people are quite willing to volunteer to do this, volunteer observing while I was sleeping, and everyone else, all the other aurora observers have had the same experiences. You get some people who are very conscientious and not really very capable. You get some people who are very conscientious and very capable. You get a lot of people who roll over in bed and never even go up to see what’s going on and write down some figment of their imagination. So you had all kinds of people. And people who just plain missed the observation.

Q. Where did all this data go?

A. It went to Cornell and I really should look up the name of the man who was in charge of the program. And then when we got back of course one of the things that we had to do was write a report about the program. I have a copy of it here. Probably the man’s name is in there. I should look. So when we got home, we spent a month or so to write that up. That’s part of the sociology, but this is a
little bit relevant, the aurora, that we had this movie every night, and what I would do is I would go to the movie, I didn’t want to miss the movie in other words, even though I was observing, so what I would do is I’d go and watch the movie and every half hour I’d go up to the tower and make my observations and then come back down, watch the movie, and then go up. And whenever the 15 minute observing thing, obviously I didn’t see very much of the movie. In fact, a lot of times I just didn’t bother to go to the movie then, but my point is I wasn’t so conscientious as to be willing to miss the daily entertainment by sitting up in the tower. And that worked out quite well. It was already dark anyway, so it wasn’t a problem of having to adapt your eyes every time you went up to observe. So it worked out quite well.

Q. In this observation tower, did you have some kind of a heating source? It must have been pretty uncomfortable.

A. Of course the whole station was heated, naturally. And the heating was by individual space heaters, either just a stove that burned fuel oil. That was one kind. The other kind were blower actuated things and they had these snakes and hoses going all over the place, one heater would supply several rooms in a building kind of thing. And there was one heater which had these things ducted up to the aurora tower, so that the tower was warm. You could sit in street clothes in the tower. On the other hand, the observing dome, especially if somebody was in there, the breath, the condensation would fog up the dome, so we had a very elaborate system of … you had three centrifugal fan blowers that we installed in there and these heater hoses from the heater which was down in the building
below the tower, that blew hot air onto the dome, so you could keep it clear of frost. It sometimes got cold enough that heat wasn’t sufficient. The other thing was we had a hatch in the top of the tower, so if everything else failed, you could stick your head out in the air without the protection of the dome. We did that occasionally. And often we had to crawl out there because of the spectrograph in particular. It had a little chopper that whined that was driven by an electric motor which sat out in the cold. And that thing was one of the things that constantly was a problem. We often had to crawl out there in the miserable cold, dark conditions, to dismount the thing, bring it inside and try to fix it and put it back out.

Q. Put your mechanical engineering degree to work.

A. Yea, right. It wasn’t very successful. And sometimes, especially with the circuitry in the spectrograph, the fellow who was one of the people who worked for the Bureau of Standards, doing upper atmosphere sounding who was an electrical engineer, very experienced, he helped me a lot with some of the insoluble electrical problems that I had.

Q. What else was going on at Byrd station leading up to your involvement in the traverse?

A. Well, as I said, because in the summer I literally didn’t have any program to follow, what I did was preparations because it didn’t take near all my time. So I was very eager to go out and see things other than just the station and doing the program at the station. So I volunteered, I helped around the station. There were construction projects, there was digging stuff out, I helped with all that. And I did a lot of inventorying of supplies and general supplies for the station. One big
activity was making, just developing photographs for other people, just amateur photograph kind of thing that people do. Because I had had an interest in photography for years and years and knew how to work in a dark room. And then when Christmas card time came, I made Christmas cards for everybody. I don’t know how many hundreds of Christmas cards I made. Bu the other thing was I tried to get to field parties and look around and other things. And I buttonholed aircraft crews that went out to resupply the field parties. Byrd was pretty much the center of air support and just air activity in general at that point. And so I was reasonably successful in getting taken along on various resupply flights and even got to go, I was already thinking about the following summer trying to get out in the field. I didn’t want to just have spent a year in Antarctica sitting in a station and going home again. I wanted to get out and stomp around like an explorer. And I got friendly, particularly with a geologist who was at that time at the University of Minnesota, Cam Craddock, Campbell Craddock, who then shortly after that went to the University of Wisconsin and I think the rest of his career was spent there. And he was actually willing to think about taking me as a field assistant the following summer. So he and Ed Thiel, who was a Wisconsin geophysicist and a man named Ed Robinson, who was then a graduate student at Wisconsin, and they were going on a reconnaissance for the geological field work and they took me along. So we had this very interesting long, long flight from Byrd station out to what was then thought to be the Thurston Peninsula. It turned out to be an island and we were the first to see the Jones Mountains on that flight. And then we made a landing at Nunatak, quite a way east of Byrd, and we went
and Cam pounded the rocks and I dragged the little sled full of rocks back for him. So anyway, we made a landing out in the boondocks. These were all done in R4Ds by the way, C47 now called. DC3 airplanes. So that was a very interesting flight. And as I say I made a couple of resupply flights to traverses. And in the end it turned out that I in fact, I don’t remember now why, but I did not go with Craddock into the field. A brief aside that has nothing to do with anything, but I guess I must have been prepared for a long flight and I don’t really remember how long it was, but it was many hours obviously. But I read Jenny Darlington’s book called My Antarctic Honeymoon and Jenny Darlington is one of the two women that wintered over in Antarctica on the Ronne Expedition. The other one was Ronne’s wife. And they were the first winter over women in the Antarctic, I believe. This was in the late 40’s, 1947 I think. If you’ve never read the book you might want to read it. It’s kind of interesting. It was more or less an account of the personality problems between Finn Ronne and his expedition members, and particularly Harry Darlington, her husband who was supposed to be the chief pilot. Apparently got in Ronne’s bad books and things didn’t work out too well. I read that book on that trip and I still remember.

Q. How do we get to the traverse? You’re doing volunteer work?
A. Well that was the following year..

Q. Okay.
A. The first summer all I did was cadge rides to go out and see some things away from the station. But most of the time, of course, I spent at the station doing whatever was worth doing or interesting. But the traverse to South Pole was the
following summer, ‘60-61 and I’m now talking about the first summer, which was ‘59-‘60. I don’t know whether you want to go chronologically, but that pretty much takes us to question number?

Q. In the second summer you had the opportunity to become involved in the first American traverse to the South Pole. Can you discuss how that came about?

A. Well as I said, I was very reluctant to have spent a year in Antarctica basically sitting at a station. I wanted to have a little more adventure than that. And so the first summer I had tried already to connect with some kind of field program for the next summer. And all during the year I buttonholed or nagged the National Science Foundation basically to find out what the possibilities were of getting on a field party the following summer. And of course being very naïve and new to the Antarctic program at the time, I didn’t realize that basically people made up their field parties way ahead of time at home and there was very little prospect of just joining a field party that came down just because you happen to be available. It happened but it was not at all common. And so there was not very much prospect of doing that. I sent radio messages and so on periodically and never got any real satisfaction. And then in the summer of ’60-61, the Navy had decided that the best and most efficient way to get two large D8 caterpillar tractors, bulldozers, for some new construction at South Pole, to the station at South Pole, was to drive them there, rather than take them by air, I don’t know how many hundreds of tons of machines they would have had to disassemble in order to fit them in stages in C-130’s and fly them to the pole. They decided it would make more sense to drive them there and then at Byrd, I think we had four of them, and
so that two of them were designated to go to South Pole. Now I think part of the motivation was simply a publicity stunt, the Americans driving to the pole and specifically the military, the Navy driving to the Pole as opposed to USARP driving to the Pole, which was in the works also. The scientific traverse was all civilians and different vehicles and other stuff. And there had been lots of traversing from IGY on, but not a direct trip to the Pole. And so in the end it turned out that the Navy actually had Army officers in charge of these so-called tractor trains because the Army had had a lot of experience in this in Greenland and the man that was in charge of the trip from Byrd to Pole to take these two tractors was an Army major, Antero Havola, who is on your list, by the way. I didn’t realize he was still alive. He’s a Finn that the U.S. Army had recruited right after the Second World War, commissioned him in the U.S. Army. He had been a Finnish Army officer, as a cold weather expert. So he was the leader of this traverse and the navigator was a warrant officer in the U.S. Army, who had done the same kind of thing in Greenland. And Major Havola was very interested in being able to say that there had been science done on his traverse to the Pole. The two wanigans that we had, one was for sleeping and the other for cooking and eating, had enough accommodations, specifically two extra bunks, two bunks more than needed for the drivers and the mechanics for the trip. So he proposed to take two people along as scientists and the University of Wisconsin sent a man down to do some geophysics. It was gravity observations. And from the gravity observations you’d deduce the thickness of the ice cap. So that was his operation. And because I had been nagging about going somewhere and doing something,
the things just fell into place and they said okay you can go. I had proposed doing
glaciology and weather observations. And so they said okay, you can go, because
there’s a space and you’ve been giving us a hard time about it. So you can go.
And when we were getting ready to go, Dr. Goldthwait, who was at Byrd with a
field party waiting to go out in the field and do geology and when he found out
that I had submitted this proposal to do glaciology on the traverse, he said you
might as well do something useful, I’ll show you how to dig sort of a standard
snow pit. The traverses, the scientific traverses, were doing this routinely, which
is basically a two meter pit and measuring snow density and temperature and
recording the stratigraphy of the pit. I did that by photographing rather than
sketching or describing. So I wound up going as a glaciologist and weather
observer. I observed weather twice a day maybe and I dug a pit every night. The
traverse took about 30 days or so and we went not quite straight south, but around
the eastern end of the Transarctic, southern-most end of the Transarctic
Mountains, which meant going southeast from Byrd and then up on the plateau
and straight down the meridian to the pole. Of course, it was the first American
ground party to the South Pole, but it also started from Byrd station which was 80
degrees south and not from the coast. So that may degrade the claim. In fact,
Bert Crary had a scientific traverse that went from McMurdo to South Pole in the
same season. They got there two weeks or something after we did. And they
started from McMurdo. So they started from the coast. So maybe they should get
the glory, but anyway … Byrd had been constructed largely by tractor trains from
Little America to Byrd during the beginning of the IGY. So there was in fact a
complete tractor track from the coast via Byrd to the South Pole. But we only did
the leg from Byrd to Pole. You can look it up here if you need to know the
numbers, 600 and some miles.

Q. What sort of problems did you encounter on this traverse?

A. Well the one problem we had was that we ran into some unexpected crevasses.
And it turned out to be a very minor incident in the end. But of course it was a big
panic when it happened. As I said, we went east on the north side of the
Transantarctic mountains and then turned south after we had cleared them. We
were way up on the plateau by then and I wrote it down here. It was 87 ½ degrees
south, 78 degrees west. And at that stage no one expected to see crevasses
anymore. They figured that we were out of the terrain that was likely to lead to
crevasses. There was not ice flowing downhill, flowing over obstacles anymore. It
was pool table flat area. And maybe I should back up a minute and say what the
composition of the tractor train was. There were 2 D-8s, and each had two 20 ton
sleds behind it. One had fuel on both sleds for the whole operation. And the other
one was the two wanigans, one for sleeping and one for cooking and eating. And
in addition to that, we had two Weasels which are amphibious tracked, small
vehicles, that were used as landing craft and were very commonly used in polar
areas in the 50s. Not much later than that I guess. Both in Greenland and
Antarctica. And so the Weasel was the navigation vehicle. It led off. We had a
spare one that was dragged behind one of the D-8s on a sled. So then there was a
driver and a navigator and the Weasel navigator stood on a platform. On the back
were a large number of bamboos and to keep a straight line he’d plant a bamboo
every quarter of a mile and by looking backwards, keep a straight line by lining up the bamboo poles. And then the two D-8s followed more or less side by side, with everybody riding in the bunkhouse, except the drivers, of course. We had these crevasse detectors on the Weasel. The crevasse detectors are a number of aluminum dishes, I think there are four of them, on a structure in front of the vehicle and then an electrical current was passed through the thing and the theory was that the resistance changed from the solid snow to crevasse air, that resistance contrast would trigger off a pointer or a needle that would tell you that a crevasse was in front of you. Well, these things worked sometimes in some places; the scientific traverses used them also. But they were highly unreliable and in any case, in our situation it did not give a warning and the Weasel went over with no problem at all. And when the D-8 went over the first crevasse, it was heavy enough so that … these are low ground pressure, so-called, vehicles that were built with especially wide tracks to reduce the ground pressure. Nevertheless, it broke a bridge over a very, very small crevasse, no more than two feet wide if that. And so we didn’t detect the crevasse until after we had actually crossed it with the D-8. And it turned out, and of course everything came to a screeching halt. The first thing that Major Havola did was get on the radio and call McMurdo and say “We’ve got a problem. We’re in the crevasses here. We want an aerial reconnaissance.” And see what advice we get about what’s going on out here. And eventually they came over with an airplane and took pictures with a Polaroid camera and threw them down from it. And of course talked to us on the radio about what they had observed. And they said these things peter out shortly, go this
way and you'll get out of them. So that's what we did. And if you look on the maps here you can see a little jog in the track. What had happened was that we had crossed from uncrevassed snow, the crack which was a filled-in crevasse, a gigantic one, I don't know how many hundreds of yards wide. There was a completely filled in crevasse that we were sitting on. And what we had actually opened up was the crack between the new stuff that had been filled in and the original wall. And so there was another wall or whatever 200 yards the other side of this one. And so what they said was “Go down along this crack and eventually it peters out.” So that's what we wound up doing. And it turned out that besides Major Havola, the only other person who had ever done any skiing was me. And my skiing was strictly recreational, downhill, so he said “Well you follow the crack on this side and I'll follow the crack on that side, so that these people can stay as far away from it as possible.” So I skied down one crack and Havola skied down the other crack. And within again, I'd have to look it up, but a short distance, maybe five miles or something, the cracks ended and so we had turned from going south, we went west for a few miles and then turned back south and headed straight to the pole. And that was our big event. Other problems were the usual weather problems. We'd stop if the weather got so bad that you couldn't see very well and I have some pictures where everything is snowed in from sitting for three days in a blizzard. I remember no serious mechanical problems with the vehicles. The navigator, who had tons of Arctic experience, but he was kind of an unpleasant guy, I didn't like him. But anyway, he insisted on going without his sunglasses, and of course, he got a bad case of snow blindness. He was evidently
a competent navigator. He used to take a sun shot more or less every day when we stopped for the day. He would take a sun shot to determine the position for that day and our direction to go for the next day. But the navigation was essentially dead reckoning from the odometers on the vehicles and staying on a certain course. And then he confirmed that with a sun shot. So that snow blindness was a minor problem. It was very uncomfortable for him. The other thing, it was very unpredictable, the surface sometimes would be very smooth and even soft snow, hard to travel through. Most of the time it was no problem at all. But then we ran into some areas, it was always only a few miles, 10, 20, 30 miles, with huge sastrugi. Very hard sastrugi. I have some pictures of sastrugi a meter, meter and a half high. And that was hard on the vehicles. And incidentally, the rate of travel of these things was about two miles an hour. We traveled probably 15-16 hours per day and probably did 30 miles per day. Probably actually less than that because I think the total trip was 700 something miles in 30 some days. But of course there were days when we didn’t move at all because of weather. But that was relatively little.

Q. You were digging snow pits. How did this work out with all the traveling because you were digging the snow pits on a regular …

A. Right, what my routine was more or less like it was when I was observing aurora. I’d sleep while the train was traveling and then when we stopped for the night, I’d have my meal and then I’d dig my pit after dinner and spend half the night. Digging it was a matter of an hour, hour and a half or something. A two meter pit is relatively easy for one guy to dig. Once you get much beyond that, you almost
need two people because you usually have to relay the snow out of the pit. It gets
too high to throw it out by yourself. So that was one reason why we used two
meters. And I even someplace figured out once how much energy a person
consumes digging a standard two meter pit. But anyway, the one thing that
bothered me was that they kept the engines running on these things 24 hours a day
on the Caterpillar tractors. And invariably, no matter where I dug that pit, the
damn exhaust would always find me in the pit. But I’d dig the pit in the evening
after supper and do my measurements and then go to bed. And then probably four,
five, six hours total time and then I would sleep while the thing was moving and
most of the time I didn’t have any problem. I did a weather observation in the
evening and then again in the mornings. And I dug a pit every stop. And that’s
actually what led to my winding up at OSU in the end, because Goldthwait had
told me what he would like to have done and he said if you’ve got any, collect any
data, let me know and I’ll give you a month’s salary and a desk. So you can write
it up for us. But I guess that’s chronologically down the pike from what we’re
talking about right now.

Q. So the data was eventually destined for Ohio State University?
A. Right. Well it wasn’t commissioned by Ohio State. It wasn’t an official Ohio
State project, but he said if you’re going to do this, you might as well do
something useful and if you do get some data, then come to Ohio State and we
want to have it written up.

Q. Okay. Is there anything you would like to say about your colleagues on this
traverse?
A. Yea, the crew as I said, leadership was Army people from Greenland, namely Major Havola, who was in charge, and a Chief Warrant Officer. All of a sudden I’m drawing a blank on his name, but you can find it. So they were the two guys in charge. He was the navigator and then there were four D-8 driver mechanics, they were basically drivers. In addition to that, they recruited the two radiomen, the cook and the Chief Petty Officer that had been with us at Byrd. (The Chief Petty Officer, Walter Davis, was a mechanic) as part of the crew for this traverse, plus Forrest Dowling from University of Wisconsin; he was a geophysicist, and myself. And Chief Davis, Walter Davis, was an Antarctic veteran at that point. He’d wintered at Ellsworth during the IGY. He was kind of a gruff guy, but basically a really nice guy and very, very competent and hard worker. He really was sort of the epitome of the senior enlisted people in the service. He knew what he was doing and even though he was sometimes hard to get along with, he was basically a nice guy and he had the respect of everybody and so on. And then the cook was also a really hard working guy. He was not the kind of person that I would ever be a personal friend with, but he did very well for our meals. And the two radiomen, everybody did a great job on that trip. I don’t think there were any deficiencies or anybody goofing off or lack of enthusiasm or any of that stuff. There was some actually, I hate to keep riding this navigator Warrant Officer Fowler, but he was the only guy, his attitude, he was almost mutinous against Major Havola. He just sort of undermined Havola’s authority behind his back a lot of times. I mean Havola was kind of, I think, looked at as something of a fuddy duddy and an old woman and not really a leadership type guy. He was a
really nice guy and he was perfectly competent to do the job, but the combination of his personality and the navigator’s and the guy was just plain disloyal and not right. And that was the one personal thing that was a problem. But it had no consequences.

Q. You were out in the field for about 30 days. What did people do for entertainment?

A. Well, we didn’t do much of anything for entertainment because we were traveling all the time and eating and sleeping when we weren’t traveling, basically. Of course, Christmas and New Year’s, this trip was something like early to mid December to sometime toward the end of January. So both Christmas and New Year’s we were on the trail and on both occasions there was a very elaborate to-do about celebrating and having a fancy meal and we, Major Havola, made a special effort to have menus, one menu per man, kind of thing. And he handed out little patches that somebody in the Antarctic had thought up, these patches called the Antarctica Ski Club and so he gave each person a patch from the Antarctica Ski Club and a menu and I have all that stuff over here if you want to look at it. I saved that. There was some publicity to-do when we departed and the Navy sent photographers, of course, to record all this. And then when we got to South Pole, people from the station came out to meet us a few miles out. And then we circled the flag at the pole and put up a sign with everybody’s name on it and they took pictures of that. So they tried to beat the drums a little bit. And Havola put together a list of all of the trips, all the overland trips to the pole starting with
Amundsen. He wanted to get his trip acknowledged in the list of people who had driven to the South Pole.

Q. You mentioned that the Navy was quite interested in getting publicity for its traverse. But it was an Army led traverse. Who were the Navy people?

A. Well the Navy people were all, everyone except Darling and me as civilians and Havola as the man in charge and the navigator. So all of the enlisted people, they were all enlisted people including the Chief Petty Officer, Walt Davis, the cook, the two radiomen, and the four driver mechanics. They were all Navy people. This was standard practice. As far as I know, all of the tractor trains in Antarctica starting with the IGY were always run by Army officers because they had the Greenland experience to draw on.

Q. So you completed the traverse to the South Pole station. How did you get back to Byrd and complete the rest of your mission there?

A. Well, okay, my “mission” had ended in November because that was the normal one year tour for people who wintered over. So I had completed all my aurora stuff before I ever left on the traverse to the Pole. And that was the end of my obligation to the aurora program. As far as physically, we left the two D8’s obviously at Pole Station because that was the purpose of the trip after all. And then the field party was taken back to McMurdo by air in C-130s, regular long series of many, many flights to resupply the station every summer. So we got on the first available C-130 and I believe it took at least one of the Weasels back and maybe both of them. And we flew back to McMurdo, whatever it is, four hour flight or something. And spent a little time at McMurdo and then I had agreed to
go back to Byrd to help in the construction for the substation for the aurora
program for the following winter. This was planned to be far enough away from
Byrd to allow triangulation of aurora in order to determine how high they were.
The idea was to have two people at this substation wintering there and
presumably going back and forth occasionally. The program was planned to have
two people out there and then there was a normal observer at the station. So they
needed to construct a small camp for that. I was there for the rest of the summer
season helping to put the station together and one of the things I remember
actually, now that you bring it up, was these are pre-fabricated structures that they
would just haul out to the place. And they brought them in on C-130s at Byrd and
trying to unload those things from the C-130 was incredibly, what’s the right
word, difficult job because the things just barely fit through the tailgate of the
airplane of the C-130s, as you probably know, it has a rear door, the rear opens
up, the fuselage is built so that the tail section, bottom of the tail section of the
fuselage swings up and a ramp comes down and that’s how you unload the cargo.
In fact, they do air drops that way too. But the cut-out was just barely big enough
to take these buildings and of course the airplane doesn’t always come to rest
exactly horizontal and there’s a slight twist. And we had these long two wheeled
pry bars essentially, you lift something up and then roll it out with this six or eight
foot long bar. And they’d never shut the engines off on the C-130s, very seldom.
The standard procedure is to leave the engines running. There’s horrendous noise
and wind and a smell from the exhaust and you’re back there. You can’t
communicate with each other. Trying to unload these. And by half an inch they
won’t clear. And try to wrestle those buildings out of the tail of a C-130 was one of the worst experiences of my life. And in fact, there have been two or three accidents in Antarctica unloading C-130s and people have actually got crushed, sled backing up and squeezing a guy between the ramp and the sled. That’s happened a couple of times and people getting injured and it’s mostly because of the situation. It’s so noisy, people have parkas and hoods on, they can’t see, so it’s really not a good thing. But still 40 years ago, I still remember hassling with those damn prefab boxes trying to get them out of that C-130. And of course, again it’s the same situation where you are kind of a neophyte and the loadmaster doesn’t want to pay any attention to what you’re saying. You think you know what the heck you’re doing trying to get these things out and there is just confusion. We built the station, they sent a couple of extra guys down of course, to do that and three of us, four of us I guess put this thing together. Then in the end, they wound up not occupying it for the winter for some reason. I guess they just considered it unsafe or something. But anyway, so I spent the second summer at Byrd doing that and went home on the last flight out of Byrd to McMurdo. And back from McMurdo to New Zealand on a Constellation. So I wound up spending about 15 months in Antarctica that first winter over and following summer, from November ’59 to February ’61.

Q. Wanted to ask you about how your first experience in Antarctica served to impact your career that followed?

A. Well, I guess basically what happened is that it sort of determined the rest of my professional existence, career if you want to call it that. Because I wound up
coming to Ohio State at Dr. Goldthwait’s invitation. He had shown me what to do on this traverse in the way of digging pits and gathering data that at that time was valuable because it was an area that hadn’t been traversed in the reconnaissance phase of Antarctic glaciology and he told me that if I obtained anything worthwhile, that he would give me a desk and a month’s salary to write a report for him. That’s in fact what I did after I got back from my Antarctic stay and a vacation trip that I took following that. So I came to Ohio State in the spring of ’61, late spring, May, and I did have quite a lot of data and wrote the report. Eventually a version got published in the Journal of Glaciology and Dr. Goldthwait then encouraged me to stay at Ohio State at the then Institute of Polar Studies. And he said he had all kinds of projects that required people and he could probably support me. Really the only way to work at the Institute of Polar Studies was either as a faculty person who had grants to do polar research through the Institute or as a graduate student. There were basically no positions for scientists as such. And so it was a matter of having to become a graduate student in order to stay on. And so basically my Antarctic experience and specifically traverse would determine the rest of my life because I just kept on doing things and certainly at the beginning I was field assistant for projects of one sort or another, both north and south, almost every year for several years. North was basically in Greenland, southern Greenland and south in the Antarctic. And in between I went to graduate school and I knew right from the beginning that I didn’t want to be a geologist. The closest connection to work at the Institute was really geology because Dr. Goldthwait was a geologist and the whole program was housed in the
geology building and there were a lot of geologists connected with it. There was some botany, a little bit of life science in general. That didn’t last very long. And so I had to find some kind of subject that … I had always been interested in maps, something interesting. I had the mathematical background and interest in photography. So I wound up picking geodetic science as a subject to pursue. But again, this was sort of an afterthought approach to my subject because I really didn’t have the goal of graduate school. I had the goal of continuing this kind of casual polar existence and the graduate school became a means to do that. And my whole career, as it developed, was more or less a continuation of that mode of existence. And I took far longer than normal or even necessary in my case to finish a Master’s degree in Geodetic Science. I think I got the degree in ’76, no ’66 sorry, ’66, and then of course there’s another question that everybody would say, now you’ve got to go on to the Ph.D. And I finally let myself be persuaded and pursued that on and off for years. And eventually flunked the generals once and then eventually passed them on the second try. In between, I went to the Netherlands for a year in 1969 and I did a one year course which had a degree attached to it. But that was not really the reason for doing the course. I wanted to learn some real photogrammetry, which in geodetic science, well it was basically “second fiddle” to begin with. And what photogrammetry there was was on paper with very little hands on experience. So I decided to do this course, something called the I.T.C. for short, International Institute for Aerial Survey and Earth Sciences. And that sort of qualified me or shunted me off from strictly being a
glaciology assistant, field assistant, to having a specialty of applying standard
photogrammetric techniques to glaciology problems.

Q. Your career at Ohio State extended more than 30 years since your first traverse in
Antarctica. Can you give us a sense of who and what have been the major
influences upon your career at Ohio State?

A. Well again, I have to put in this remark about having a scientific career at all. I
hesitate to call it that. I certainly had an interesting career and experience, but it
hasn’t been terribly scientific. And so you know, it’s not like some prominent
physicist being able to point to having worked with Einstein or something. I don’t
think you can make that kind of comparison. But as far as a straight forward
answer to the question, I would say probably Colin Bull was a big influence,
partly because he was one of the first people that I encountered when I came here
in 1961 to write up the pole traverse stuff. I got to know him quite well. He was a
very engaging, personable guy, and we seemed to get along. So I took his
glaciology course, took a course from him in geophysics as part of my graduate
studies. So he’s one person. Richard Goldthwait, he was of course the first person
that I had any dealings with and I actually never took a class from Goldthwait. My
field really was not connected, he was a glacial geologist basically. He was also
knowledgeable in glaciology but he didn’t teach glaciology. Worked in the field
with him I think only once in Greenland in the mid-60’s. But just because he was
in charge, he was obviously an influence. And then there were a couple of people
in geodetic science, professors in geodetic science who unavoidably had an
influence. One person was Urho Uotila, who was a physical geodesy professor
and he also happened to be my thesis advisor for my master’s thesis. And then after I did the one year course in the Netherlands and came back here to work on a Ph.D., Dean Merchant, he was then the photogrammetry professor in the department here. I was his lab assistant for a couple of courses. And he certainly had an impact on my interest in mastering photogrammetry. And perhaps one other person was Professor Hans Jerie at the I.T.C. in the Netherlands, who was an Austrian expatriate and something of a connection because of that. And he seemed to be impressed by my performance as a student there in ’69 and he invited me to come back and work as a research person for him five years later when I was looking for a Ph.D. topic. He gave me a chunk of a larger program to work on. Those were not polar people. And perhaps the other person I need to point to is Terry Hughes, who was a glaciologist here and then moved to the University of Maine and I worked very closely with him on at least one project while he was still here, two years on Deception Island and did a lot of field work in the summer and did some photogrammetry for him on that survey in the field. And then later, the two large projects for surface motion on large bodies of ice I did as kind of a subcontract arrangement for Terry, was for Byrd Glacier in the Antarctic and the other was Jakobshavn Glacier in Greenland. And then on and off over the years, worked with Lonnie Thompson closely, basically either in the field with him doing the necessary surveys for basically strain networks in the field and I have done quite a lot of photogrammetry for him in a couple of places.
Q. If I can ask you, your work has involved quite a few field trips. As you said, you were in Antarctica 11-12 times, something like that. In looking at your career, is it the field trips that stand out as what kept you going?

A. Yea, I would think so. I’m actually a little ambivalent about that. I mean, the interesting part of the work is usually getting out into new places and out into the boondocks here and there and everywhere, which has been the main motivation for staying in this thing all my life actually. That’s definitely the case. Once you are actually out in the field and living in a tent in the miserable cold, unpleasant conditions, you often wonder why the heck am I doing this kind of thing. There’s an easier way to make a living. But I think it goes back to the same kind of attitude that I had before I ever went to Antarctica for the first time. I just prefer that kind of existence when I can do it, to normal every day 8:00-5:00 job, largely going to an office and coming home and doing what 99% of the world’s population does for a living. The short answer would have been yes.

Q. Okay. So it was the adventure.

A. Of course. I think I would have to put adventure in quotes because some of it, most of it is not all that much adventure, but certainly that aspect has been by far the dominating consideration in this so-called career. No question. I think I’m fairly competent at what I do, technically speaking, but it’s not in any sense out of the ordinary, pioneering, kind of science thing to me.

Q. From what you’ve said already, it seems fairly clear that you enjoyed in particular the field aspect of your science in Antarctica, in Greenland and elsewhere. Can you talk a little bit about the satisfactions that you’ve experienced?
A. Yea, I think the main incentive to me is the ability to have a variety of experience in your life that you don’t get from a steady job. The fact that your routine over the year being varied and being able to go to new and interesting places and going there in a functional capacity working with the locals, as compared to being, no matter what kind of tourism experience you might have, it’s not like as genuine as being in a place and doing work and getting to meet, getting to interact with the local people as I’ve done for instance in China and Peru with Lonnie. In Greenland there’s not very much interaction with the locals, although I have taken time to go and see places which I probably otherwise would never have got to see. And then just the experience of seeing all of these and living in all of these relatively exotic places. And things that not many people get a chance to do.

Q. You have been a member of the OSU Byrd Polar Research Center since 1962. In looking at the history of the Center, what do you remember as outstanding projects or turning points in the history of the Center?

A. Well from my personal perspective, needless to say, I have to put that qualifier in there and again, not flattering myself as being a scientist, I would say probably scientifically one of the most important things has been the discovery of a Lystrosaurus fossil by David Elliot. The other scientific things I can point to is Lonnie Thompson’s now 20+ year career at the Byrd Center, his paleoclimatology studies are certainly one of the highlights. Meteorology and climatology under David Bromwich, which essentially didn’t exist before his arrival. And there were some very minor efforts years before him, but he’s really built up a program there. Same thing with the arrival of Ken Jezek in starting a very active remote
sensing operation, which didn't exist before him. Ian Whillans, who studies particularly the West Antarctic Ice Streams. I’m sure there’s a lot of geology which is significant and I’m just not qualified to talk about. I also noticed that Dr. Goldthwait’s research area in Southeastern Alaska was very active when he was here and his graduate students were working there and since that generation, that has completely disappeared. And then as far as events go, obviously the acquisition of the Byrd papers and memorabilia had a big impact. Change of name for one thing. But in a much more substantive way, there’s money available for fellowships and that. And then I would say the physical move from central campus to west campus has certainly had an impact, mostly positive, but some negative aspects due to physical separation from the center of activities (on campus).

Q. In thinking about your career, can you for the record identify the highlights and the disappointments, if any?

A. Well I’ll preface this by saying that there haven’t been either highlights or disappointments in any major sense of the word. Basically again, it’s viewed as not really having any real scientific agenda to pursue. So in that sense I really can’t point to anything. I can point to what I think is one accomplishment and that is that I won’t say it’s unique, but I probably pioneered the application of a routine procedure in photogrammetry known as block aerial triangulation, which in very basic terms means assembling a large number of photographs to cover an area and with minimal ground control to determine positions of lots of points within this block. This is very commonly applied to topographic mapping and I
think I was one of the first people to apply this to studies of surface motion of relatively large pieces of ice, both ice sheets and large and specifically the Byrd Glacier in Antarctica and the Jakobshavn Glacier drainage basin in Greenland. So I think that would be the one accomplishment I could point to. One disappointment in the sense of I think was a missed opportunity, is that I proposed to take a snowmobile from Byrd Station to Mt. Chapman, this was in the late 60’s, to try to save a long line of markers which had been set out there a few years previously, the idea being to measure surface motion of the ice sheet from Mt. Chapman to Byrd Station, a distance of 100 miles or so, by photogrammetry. And these markers of course over a matter of a year or two get buried by new snow. I wanted to go and save them from loss by pulling them up once more and possibly having the opportunity to do a better job of photographing and measuring the motion that had been done before. But the powers that be, as I say, were not interested in backing that venture.

Q. Do you recall when this was?

A. This must have been probably ’68 or so. The project was active in ’65 and ’66. There were flights in those two Antarctic summers, ‘65-66, and ’66-67 and ’66-67, we drove down that line for the terrestrial survey, control surveys for this job and pulled all these markers up. And they were just about buried; they were right on the surface all of them. So I figured in another two years they would be buried again and I wanted to try to save them, but that didn’t work out.

Q. Can you describe the markers?
A. Yea, the markers, in fact it was quite an elaborate project that Dr. Brandenberger, who was the photogrammetry professor from the late ‘50’s and mid ‘60’s or so, developed this project, which exploited certain specific geometry layout to make these measurements. And the point was to measure the position of these markers relative to a fixed point which in this case was Mt. Chapman and so there was a design, because the surface doesn’t have enough distinguishing features on it, it’s basically the flat white snow, the idea was to put in a marker every so often, which would be visible in the photography. And the marker consisted of a five by five foot piece of plywood painted black, fastened to the top of a three or four inch diameter pipe in sort of a T shape, looking at it from the side. And the black square looking at it from an airplane, photographing it from an airplane. And these things were set in shallow holes in the ice and so eventually they drifted over and had to be raised to the surface so you wouldn’t get them lost. And I even remember they built some kind of a scale model one year and the aeronautical engineers put it in the wind tunnel and tested it and the winds were more than they would have expected to get before they settled on the final design.

Q. Any idea why the project wasn’t supported? Were there other things competing with it?

A. Yea, that probably is actually what happened. I think Colin Bull was the director at the time, did not want to petition NSF for the resources to do that for fear that he was detracting from some more worthwhile or more important projects.

Q. Okay. It’s been said that Antarctic science is notable for its holistic, interdisciplinary nature. Can you agree or disagree with that statement?
A. Well again, I have to plead a little bit on the lack of qualification, because I don’t have a broad enough scientific outlook on these things. But they are holistic in the sense that all Antarctic phenomena, at least there’s an attempt made, to study all Antarctic phenomena. In fact, phenomena that are not specifically polar or Antarctic, but Antarctica is the best place to study them. And you get a lot of upper air atmosphere geophysics that goes on. And now astronomy and other fancy, not particle physics. So in that sense it’s holistic to try to look at every aspect of Antarctica from geology to glaciology to the life sciences to psychology of isolated groups and so on. In another sense, it’s kind of a side issue, that often the summer field camps are deliberately designed to encompass people in various disciplines and it’s a matter of practical logistics to mount a relatively large field effort and make it pay to try to have people in various disciplines working out of the same field camp. And of course, the wintering stations had a relatively large number of projects going simultaneously in several disciplines. In my winter for instance, a big part of the project was meteorology with the U.S. Weather Bureau. We had a qualified meteorologist and three or four or five observers and technicians. And then there was earth magnetism and seismology and upper atmosphere physics, aurora specifically, and sounding of the ionosphere. And glaciology at some of the stations. So the six stations had a rather broad program of scientists. But I think I would characterize it more as multi-disciplinary rather than inter-disciplinary, see the distinction.

Q. Would you elaborate on that?
A. Well it just seems like there are people doing all kinds of science, but they are not necessarily doing it together. Even though there are many different branches of science being investigated, they are not necessarily tying their results together, publishing them together, coming up with this so-called holistic view of Antarctica. I mean the geologists publishing geology and the glaciologists do the glaciology and so on. Say the people from the U.S.G.S. who are responsible for the mapping, they do mapping which serves a large community of interests, but again they are doing mapping and there is really no interaction with the other people in a physics sense. You might have just logistics. So that’s why we say multi-disciplinary rather than inter-disciplinary.

Q. Yea, that’s a good point. What problems and successes did you encounter in obtaining support from NSF or other organizations for your investigations?

A. Well I’d have to say to start with that overwhelmingly I’ve worked for other people and therefore I’m not representative of the usual PI who is writing his own proposals based on his own ideas. And so I can’t really answer that question directly. I had only one proposals specifically on my own and that was funded with no difficulty at all. I contributed to writing proposals with several other people and some have got shot down and others were funded. Particularly with Terry Hughes at the University of Maine, where I wrote the part of the proposals pertaining to the nuts and bolts of carrying out photogrammetric surveys and measurements, whereas he wrote the scientific justification and so on and I think most of it, the ones I’ve been involved in, got funded. Support has been entirely from NSF in my case. So I can’t talk about the other agencies. I’ve been involved
a little bit with various pieces of things that Lonnie Thompson has proposed, but again, it would not be meaningful to talk about my experience with other agencies.

Q. What problems and successes did you encounter in your dealings with the naval military personnel who provided support for the Antarctic scientific effort?

A. I think basically what problems there are, usually attitude problems in the sense that often the support people just do not have an understanding of science and consequently they don’t understand the reasons for scientists wanting to do things in a certain way. And so it’s not so much animosity or lack of willingness to cooperate, it’s a question of puzzlement as to why they are being asked to do things that don’t seem reasonable to them. And it’s also not so much a case of civilians versus military in particular. It’s more a case of let’s say the enlisted people in particular not having a comprehension of what it’s all about. I’ve noticed exactly the same kind of attitude more recently where the naval presence has been almost eliminated and the people who are doing the support services are now civilian contractor people and you get exactly the same kind of attitude, reaction, response, lack thereof, because of this basic lack of understanding of why science wants to do things in a certain way. It seems impractical that some poor guy has to go out and freeze his butt off for what seems to him a not very good reason.

Q. Okay. Throughout this interview we’ve been working from a list that I initiated and you reacted to. As we are near the end of this interview, are there questions that you wished that I would have raised that I didn’t?
A. Well, you asked me to think about this beforehand and I wrote down two or three other things that I could say a few words about. One thing we’ve already covered more than enough and that was my motivation in general. Two things that I’ve thought of and one is, for lack of a better word, I call the sociology of the winter over experience, describing life at a small, isolated station in Antarctica. And the other one is the marked contrast in my mind between that kind of Antarctic experience and field work in Antarctica specifically, field work in other places in general. And in fact, how that contrasts with Antarctic field work in some sense. So let me say something about that first one, about the winter over experience in general and I think that two things are worth saying about that, at least when I was wintering. The Navy was an overwhelming presence in the Antarctic. They were officially of course in charge of all the logistics and supplied all the support people, both summer and winter at the station. And support people specifically being the station officer in charge, which at the small stations were almost always a medical doctor and usually a very new medical doctor who was a naval reservist. And in our case he happened to have a regular commission, but he had just come out of medical school. And then the cooks, the carpenters, radiomen, mechanics, the electrician, plumber, whatever. In our case, we had 22 people pretty much evenly divided half military, that is naval people, and half civilian scientists, but in fact there may have been more scientists among us, technicians basically running pre-cooked observing programs at various times. But there was this very definite dichotomy between the Navy people and the civilians and it was there from day one to the end. It was on a person to person, individual basis,
completely absent. You could have a really good buddy across this dividing line, no problem at all, but in the group aspect there was always this inevitable division and in general, at least from my perspective, the Navy people had derogatory names for civilians. Not individuals but in general, they were Usarps in a slightly derogatory way or worse, they were sand crabs, which is Navy lingo for landlubbers. And the civilians were kind of not quite up to us great naval types. That was the attitude that came over. The doctor was not a naval veteran at all. As I said, he was a newcomer and he in many ways, his mode of thought and so on was very much like the rest of the civilians, but yet he was very definitely conscious of being there as a naval officer and he acted accordingly. And rightly so. I’m not complaining about that but I just wanted to point out that there was a definite division that really was not possible to overcome. But the very interesting thing to me was, and I think other people have reported the same thing, at the end of a winter, 22 of us forming kind of a unique or one group in that sense, we’re all sort of solidly against the people that came in the following summer to relieve us. It was us against these outsiders. And that was the one time where kind of solidarity between the two groups and among the people in the group. It was very apparent. The routine at a station like that, well in the first place you have people with as many motivations as there are people in the place. There are a lot of Navy people, all the Navy people were technically volunteers, but many of them in fact volunteered for this duty because they figured that the assignment that they otherwise would have been sent to was worse. And some of the civilians were there because of some advantage that accrued to them in their
career, either bonus pay while they were at this supposed hardship duty station. The other thing was the prospect of faster promotion, particularly in the Weather Bureau this was the case, if you spent a year in Antarctica you got a jump in grade that you would not get otherwise. And specifically one man that I can think of, that was largely his motivation and he was the unhappiest guy in the place. And I think in general there was a real correlation between people being down there because they wanted to be enjoying the experience and people who were there for motives other than really wanting the experience were the least happy people. But as far as the stress of the experience to my mind was entirely cabin fever related kind of thing. Boredom, some of the jobs were such that there was not very much demand. A lot of time on your hands kind of thing, which tends to make people less happy with their situation than if you’re kept busy and you’re really there because you want to be. And it’s an experience that you want to go through. So maybe this is a little bit on the psychobabble side. In my case, of course, as I’ve said, I was there because I wanted to do it and so I enjoyed the whole experience. I would occasionally get fed up as you do with any situation. And some of it was boring. But over all it was a great experience and I’ll never regret it. One incident that happened was in the first summer, there was a man in Antarctica studying sleep habits and sleep deprivation and people having the so-called big eye, not being able to sleep because of daylight and this kind of thing. And he had a calendar that he handed out to people, a log to keep track of how many, when you slept and when you didn’t for the whole year. And then some movement developed before the end of the first summer, having this psychologist
winter over, at one of the small stations, just to observe people in that kind of a situation and we were asked to vote on whether we wanted him or not. And if I’m not mistaken, I think I was the only one that voted yes. Everyone voted no. So, needless to say, he didn’t stay. And I suppose a few words about the contrast of winter and field work. As I’ve already said, to my mind the only stress in the winter over situation, there’s no physical discomfort to speak of, it’s the isolation and boredom and sort of being thrown on your own mental resources. That aspect that can be considered as stressful. And physically it’s not a challenging situation at all.

Q. You’re referring to the wintering station?

A. Right. In the field work, it seems to me it’s just the opposite. It’s physically demanding and it’s generally relatively uncomfortable, but it’s short. And so you don’t have the kind of boredom factor or cabin fever, intolerance factor I’m talking about. And one last thing, Antarctic field work as compared to field work that I’ve done in similar natural environment, conditions are far different organizationally, that is in Antarctica there’s this humongous logistic organization that is provided for you. Almost a case of showing up and being ferried around by everything that is motorized and there is relatively little vigorous physical effort required. You still have to live through the discomfort of cold and no washing and this kind of thing, where most other places things are done much more on a shoe string basis. You have to organize all your logistics, you have to supply all of your needs in general because there’s not this humongous organization behind
you. The actual physical accommodations, living conditions are often considerably less comfortable than Antarctic field work.

Q. This brings our interview to a close. And I appreciate your cooperation and your comments and I think we have some very valuable things on the tape. Thank you very much.

A. Thank you.