Dr. Irene Peden
8 May 2002

Brian Shoemaker
Interviewer

(Begin Tape 1 - Side A)

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BS: *This is an oral interview with Dr. Irene Peden conducted as part of the Polar Oral History Project of the American Polar Society and the Byrd Polar Research Center of The Ohio State University on a grant from the National Science Foundation. The interview was taken at Dr. Peden's home in Seattle, Washington, by Brian Shoemaker on the 8th of May, 2002.*

Dr. Peden, it's a pleasure to be here and get started on this. We're interested in people who go to the polar regions and why they go and from that determine the role they played in developing our programs and really history of science in the polar regions. You've played an important role because you've worked with Longwire and certainly because you had to fight to go there a long time, and that's an important aspect of it as well. So, tell me a little bit . . . let's start out with your background. Where you're from, who your mentors were, where you went to college and why you picked electrical engineering. And you went to Antarctica for a reason. You were an electrical engineer, but it's more than that because most electrical engineers wouldn't go to Antarctica. You have to be a little nutty to go down there.

IP: OK. I was born in Topeka, Kansas, and my mother had been a math major at one of the State Teachers Colleges in her younger years. My mother had to fight to get to college, because her father, who was a well-to-do man who could well have afforded to send her to college, was an old country Swede who didn't believe in education for women. And her younger sister was mathematically interested and talented, too. My grandfather was a self-taught architect and building contractor and he had a tremendous mathematical skill, according to my mother, and he had a great interest in astronomy and he looked at the stars and he figured things out and she and her sister inherited that quality. So, they both wanted to go to college and grandpa wouldn't send them.

BS: *Were there brothers?*

IP: There were younger brothers and they had no interest in any of that at all.

BS: *They didn't want to go to college*.

IP: No. No interest. One of them did, but it wasn't important to him. He just did it. So, they wanted to go and they realized it was up to them. So, mother and her sister figured out that they would alternate years of working. This is after they were out of high school. And they would send each other. So, my mother, being the older, went to work at some kind of a job, and her sister went, I guess, and then they were to trade off. And mother had, I don't know . . . maybe she got two years, but she didn't finish. Her sister did. Somehow there was a transition in how they were going to do this and mother ended up working her sister's way through. So, she didn't graduate, but in those days, you didn't have to have a college degree to go out and teach country school. And that's what they both did upon their graduations, out in western Kansas, eastern New Mexico. And mother taught mathematics, but she taught everything else. These were country schools. You

went out and lived with whoever was going to board the teacher that year and struggled your way through snow drifts to get to the school and light the fire for the kids. It was not an easy thing to do. But, from my mother I got the idea, A - you can be anything you want to be if you work at it. B - it doesn't matter what it is. If you like it, just do it. And I got that sort of attitude, I suppose, from my mother.

BS: *Are you obstinate?*

IP: Sure. And I'm the oldest child, so I'm sort of the one in the family, you know, who did the different things. There' s some kind of a pattern about that. I've read about it with oldest children. So, I grew up thinking you can do what you want to do and you can be what you want to be and it doesn't matter if your father or the whole society is against you, you can do it. I wasn't aimed that way as a child, however. I did mathematics well. I didn't care much about it one way or the other. And when I got to high school, they told me I had to take science and I wasn't interested in science. But, I talked to people and they said, "Don't take physics. Physics is *very* hard and girls don't take physics." OK, I didn't take physics. But, I finally settled on chemistry because I had to have something. I really liked it, once I got the hang of it. So, I thought I was a chemistry major and I did well in it in high school, after some start-up transients when I had a hard time organizing my thinking into that mode.

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But, after I got it, I enjoyed it a lot. I really liked it and I thought I was a chemistry major. So, I went to college thinking I was a chemistry major. And in the course of my freshman year, I guess

. . . sure it had to be, I found out that I would have to take physics. So, OK, you know. If you have to take physics, you take physics. And I took physics in my sophomore year and I loved it. I really hadn't known much about it before, but I was the kind of child who had these questions: Why is the sky blue? What does the rainbow . . .? All this stuff, and I got answers. And I got answers to questions I never thought to ask. I just loved it, so I thought, OK, I'm a physics major. And then I found out, in order to be a physics _____, you had to get a Ph.D. and you had to teach in the university. There was nothing else in those days. We're talking the mid-'40s. Pre-World War II, but not very much "pre." And I didn't want to do those things. I was just a kid.

BS: *How old are you? I'm not being personal, we're supposed to know.*

IP: I'm 76 now.

BS: *Well, you don't look it.*

IP: Well, thank you. Before the end of this calendar year, I'll be 77. But, I started college at 16. So, I didn't want to go to college that long. I wanted something I could do in four years and it happened that the physics teacher I had was the kind of teacher-teacher . . . it was not a research institution, it was a junior college in Kansas City. He was the kind who spent time with the kids. You could go in and talk to him, and in retrospect I realized that it was probably important that he had daughters. Daughters make a big difference in men's attitudes towards women's capabilities, and etc. They still do. But, at the time, I didn't think about it that way. But, I would go in and talk to him and he knew I liked physics and he liked that. And he knew that I wanted to do something that you could really . . . if you had to learn a living, you could. My mother taught me that, too. She

always had the attitude that you've got to have a fall-back plan. It was important for women to have something they can do if they need to because life is not necessarily what you expect of it. So, I had that attitude, too. And I told him that I wanted to have something that included physics, but . . . he knew what my boundary conditions were. And we talked about the things in physics that I liked best and it turned out it was the electricity and magnetism aspect of basic physics that I liked the best. And so, we kind of talked it through over I don't know how many sessions, and I ended up thinking that I would try majoring in electrical engineering. And I knew that girls didn't do that.

BS: *Which university was this now?*

IP: This was Kansas City Junior College, but then I went to the University of Colorado after that. I knew that that was not a common choice and that it might be difficult. But you know, based on my mother's attitude that she had transmitted to me, I didn't have a great deal of discomfort about that. I had already had the experience of being viewed as somewhat unusual and maybe even socially deviant because I was taking physics in college at all. And there was one other young woman who did. And she ended up getting a Ph.D. in, I think it was statistics, and she taught in Operations Research at Kansas State University for years after. We had to be very strongly motivated in those days or it just didn't happen. But, apparently we both were.

BS: *You find any prejudice . . . professors?*

IP: Oh, sure. Among peers, you bet.

BS: *Peers. How about your professors?*

IP: Actually not, in the junior college. No. I'll come to that. I also figured out quickly that I had to, even though mathematics didn't turn me on, it was a very important tool and that it was important to take it. So, I started then on a catch-up plan. I had a lot of catching up to do because when I went to the University of Colorado the next fall, I wanted to enter as an engineering major and I was able to do it because engineering schools were way down in enrollment due to World War II. By then, it had started. And the only young men they had in engineering at the University of Colorado were in the NISEP Program. Do you remember the NISEP?

BS: *Oh, yeah. I could have used the NISEPs.*

(100)

IP: But, because of the NISEPs, they had enough students to teach. They could even keep their School of Engineering open. So, they welcomed me, even though they just told me, "You've got to catch up. You've got to take these courses." So, I started doing that. And I had another period of very hard time getting my thought patterns organized for engineering, but after I got over that hump, it went OK. And I continued to like it and at that time, there were more than a dozen, I think, young women in the Engineering College at the University of Colorado - the most they had ever had. I don't know that they ever had that many again until the Equal Rights Movement started many years later. But, there's a pattern to history there, too. Women do things that are unusual during wars. And then, after the war is over, history shows they go home again.

BS: *That's interesting. In Afghanistan today, the women are better educated than the men because the men were all fighting the Russians and the women taught school. They moved into the schools.*

IP: And then the women got sent home.

BS: *Yeah. And put under the burda.*

IP: You bet. Total turnaround. There was total turnaround, although not to the extent of the burda, in this society after World War II.

BS: *You didn't have to go under the burdas.*

IP: No. But, I certainly was viewed as very strange. I'll get to that. So, anyhow I ended up getting a bachelor's degree in electrical engineering from the University of Colorado, and there weren't so many of us that there many of us in any given class. We were strung out in the various departments and we knew each other and I'm sure we got a lot of mutual support out of that. We even started a little section of what became the Society of Women Engineers, although it wasn't national at that time. It was just us, getting together. I was not elected to Tau Beta Pi as an undergraduate for two reasons. One, my grades weren't high enough because of the start-up problems I had getting organized into engineering ways of thinking. But, the other was they didn't take girls. I did get elected, many years later, by the students at the University of Washington, after I was teaching them electrical engineering, but as an undergraduate, I was not.

BS: *That's Tau Beta Pi.*

IP: Tau Beta Pi. It's the engineering honorary society equivalent of Phi Beta Kappa. So, none of us got elected to Tau Beta Pi in those days. Well, by the time I graduated, all I wanted to do was get a job. I got married, not to Mr. Peden, but to somebody else and he,

too, was an electrical engineer. I sent him to school. He had been in the Navy. He came back from World War II. He'd gone in right after high school and he wanted to go to college, and I wanted him to, so I worked his way through. But, I wanted to get married and I needed a job because I had to work his way through college and besides I wanted to. I had a very difficult time getting my first job. It was the hardest thing I ever did in my life, and I've done some *very* hard things. The hardest thing I ever did was get my first job in 1947.

BS: *As an electrical engineer?*

IP: As an electrical engineer, and it did not occur to me to back down and take any job as anything else. I just kept at it and eventually . . . oh, I should tell you, too, what the Chairman of the Department at the University of Colorado said to me when I was ready to graduate. He did not mean this in a negative sense. He really was trying to act as a counselor who understood what I was up against better than I did, because he said to me, "Now, Miss Carswell, you're about to get your electrical engineering degree and you need to realize that you will have great value as a secretary to an engineer."

BS: *I'm not laughing at you. I'm laughing at him.*

IP: I know. But, he meant it well. I've never blamed him for it. It was a sign of the times. And he was a few years from retirement himself at that time.

BS: *To give you a sign of the times, you didn't do like my daughter. She told me when she was 18, she said, "Dad, when I get married, I'm going to stay a Shoemaker." Today, if you were the same age, you might consider keeping your own name.*

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IP: That's right. In those days, it never occurred to any of us.

BS: *Anyway, my daughter got married and changed her name.*

IP: She did.

BS: *Yeah. To a very headstrong guy and she knew it probably wouldn't go over.*

IP: Yeah, ours did too. But, I could tell you another story about discrimination in college when I was in the junior college. I took drafting . . . we all did . . . and I took, oh god, it was some kind of geometry where we took a lot of three dimensional visualization and we drew things like mines, sub-surface structures and that kind of thing. . . What in the world was that? . . . But, it just happened that I was very good at that. That's just the way my brain is wired. It all unfolded in my head in front of me, so I didn't have any trouble with that at all. And I was good at drafting because I had fine finger skills and patience. And so, the gentleman who was teaching - he was maybe a year or two from retirement himself - and he was appalled to have me in his class. But, I did well and my drafting plates were so good he'd post them with others that were good. Well, it came to the time when we had the final exam and on this . . . descriptive geometry, that's what it was. And at the final, I remember, I finished first and he looked at it and, as I recall, it was probably all correct because I could just do that. And he looked at it and he looked at the rest of the class - all young men, struggling - and I remember that he said, "Now boys, Miss Carswell got it. Come on." And when the grades came out, I had Bs in both those courses and I was flabbergasted. So, I went to see him about it and he looked me in the eye and he said, "I couldn't give an A to a girl." And there was no appeal. This would have been

1943 or '44. There was no appeal. Just had to accept it. But, that's the kind of thing it was. That's the way the times were. You just had to accept it.

Well, back to . . . I didn't want to do any graduate work when I finally got out of school. All I wanted to do was get a job and live a life. Not interested in graduate school. But, I went to work, initially for a power and light company because it was the only job I could get after pounding the pavement for a long time. Electric power had not been my thing at all, but you know, I'd had the courses. And when you get out of a four-year college, you can address any aspect of the broad curriculum that you need to and learn what you need to learn. So, I took the job and it was in their long-range planning area, and it was making short-circuit calculations. You figured out ten years ahead how the planned system would respond to various kinds of faults - you tried to figure out such thing as how a tree falling over a couple of lines way out in the sticks and shorting them together would affect the rest of the system and its customers. Or, if a line opened up due to an unexpected disconnect somewhere, what's going to happen to the whole system. It was that kind of thing . . I had an analog board to do this, we didn't have digital computers. It was kind of fun, but after a while, I learned the reason that it was open was that it paid so little. By that time, the young men were coming home and they were available to be hired as well. And the only reason I got that job was because nobody else would take it that they had interviewed.

So, I took the job and it was in their long-range planning area and it was making what they call short-circuit calculations. You figured out 10 years ahead how the system would be organized and connected and you tried to figure out. And I had an analog board to do this, we didn't have digital computers. Tried to figure out if a tree falls over the line way out here, what's going to happen to the whole system. It was that kind of thing. It was kind of fun, but after a while, I had learned the job and there was nothing else to learn about it. I just did it, but I got a little bored. And about that time, the young husband I was putting through college decided he wanted to go to Stanford to finish and I thought

that was a great idea. And so, he applied and we packed up what little we owned and started driving West. Never occurred to us that there would be any admissions problem. You want to do it, you just do it. Well, we were lucky. He was admitted, but he might not have been. We didn't realize that.

BS: *Still in the undergraduate program?*

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IP: He was an undergraduate. I was just going to find another job. And I got out there and he started school and I had the usual difficult time getting a job. Very difficult. But, finally, I was interviewed by people in the Aircraft Engineering and Antenna Laboratory at what was then Stanford Research Institute. It is now SRI International. They were just opening up. They had a staff of very top-notch people that they had hired mostly from Harvard - the applied physics program at Harvard. They were doing antenna research, and they just needed somebody to make calculations for them and make measurements for them. And I was willing to do that. So, they hired me and I learned the job. And it was making calculations and asymtotic calculations on Burroughs machines, that kind of . . . And they taught me how to do laboratory measurements and because of my fine finger skills, I was good at that. And so, that worked for a while and I admired what they were doing, even though I didn't understand it. I didn't understand antenna theory from an undergraduate perspective. There wasn't one. And as time went on, I got more and more bored with what I was able to do and more and more anxious to understand, and to operate at a higher level, which people with a Master's degree could do. It took a Ph.D. to do what they were doing, but you could do a lot with a Master's degree. And I decided I really wanted to do that. And about that time, the marriage broke up anyway. He was through school. The marriage broke up, which it should have done years before it did.

And I wanted to go to Stanford and get a Master's degree. And they had, at that time, a program where people who were working, as I was at SRI, could . . . it had a name. I don't know any more what that was, but you could go to school. Take a course at a time over a 6 year period and get a Master's degree. So, I thought, 'I want to do that.' The people I was working for at SRI, I think they had adjunct appointments on the Stanford faculty and they were either applied physicists or electrical engineers, and they helped me make the connections and get admitted. So, I started doing that, one course at a time. It's a bummer. By the time you get to the end of that kind of curriculum, the courses you started with have changed. You don't even have the right prerequisites and it's a very difficult thing to do, and it's a hard life to sustain. And by that time, I was single. And so, I could devote myself to it, but it wasn't a life, so to speak. And the point came where I really had to say to myself, 'Either you do this better, or you just get out of the field and do something different.' And I decided I wanted to try full-time graduate school. So, they helped me again get admitted to graduate school as a full-time student.

BS: *At Stanford.*

IP: At Stanford.

BS: *Which year was this?*

IP: What year was this? I got my Master's in '57, and I'd been dragging it out for at least four of those six years. So, it was probably '55, when I started. Probably was, although it doesn't seem like it should have taken . . . well, I was an off-year student, so I would have gotten a degree in June, '57, but I would have finished it sooner. So, I started doing that and with the intention of just getting a Master's degree and going back to work. But, several factors interfered there. One was that I got hooked on it. I didn't want to quit. And

the other was that in those days, and maybe still for all I know, the Stanford EE faculty, at least, had as their mission, to train the next generation of faculty. That was their big thing.

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And without really telling us that that's what they were doing, they somehow imprinted us with the value of that. And I taught, when I got close to the end, I taught . . . I took a course. They didn't pay you to teach. You paid them for the course credits and I taught some introductory sections of electrical engineering courses. And I was really hooked on it. So, that's what I wanted to do.

I also . . . well, I started out thinking, well, what I really understand, I've got a basis to understand and the whole undergraduate curriculum had changed by the time I started. I had 10 years in between. I had graduated in '47, and it was '57, when I got that Master's degree. And everything had changed. The pre-requisites I thought I had, I didn't have any more. I had to learn a lot of things to handle the graduate work, so it was a tremendous work load. But, I did it. And I got so I really wanted to know more and more about it and by the time I finished, I really had a specialty because I liked it best, understood it best, in things related to electromagnetic wave propagation - not antennas per se, so much, although I'd done plenty of that and taught it. But, I ended up in the Stanford Microwave Lab getting my Ph.D., and those were the days of big high-power microwave tubes . . . just transitioning into microwave solid state. And so, I started with a professor who was big in microwave tubes and was making the transition himself, but I stayed with the tube program because I wanted to get out. By the time I was ready to graduate, I was ready to graduate. By then, ten years older than the average graduate student, I was tired of being poor.

BS: *Really, then? That time?*

IP: Oh yeah.

BS: *I was in grad school with World War II Vets and they were old. I remember at Berkeley, we hated to get the Korean War Vets in our classes. They always got the As. They knew where they were going and were more dedicated and so on.*

IP: Well, I did too, because I'd worked so long, you see, and I knew what I wanted to do. I was getting near the end in 1960-'61, and I thought I would start interviewing. I only wanted to interview universities. In the Stanford Microwave Lab, at that time, the stature things for a finishing graduate student to do were either to go to a university or to the Bell Labs. Anything else, in our minds, was second rate. Well, I didn't want to go to the Bell Labs. I didn't want to go to New Jersey, or wherever I would have had to go. I wanted to stay in the West. So, I only interviewed universities, but very few of them would interview me at all. At *all.* Wouldn't even interview me, and these often were universities that have very little shot at a graduate of the Stanford Microwave Lab, which was the status place, in those days, for that field. I had very few interviews.

But, I had a good friend from my Stanford Research Institute days and I now consider him one of my mentors. At the time, he was a very good friend who was teaching at the University of Washington. He had been an antenna research guy at SRI when I was, and he was one of these very enthusiastic people. . . again with daughters, who didn't see that I had any necessary limitations at all, and would go to the mat to convince people if they objected.

(300)

BS: *Those of us with daughters have . . . well, I raised mine to believe she could be President if she wanted to.*

IP: Absolutely. Yes. That's my point.

BS: *You know, my wife's not like that.*

IP: She's not.

BS: *No, she's not _____. My daughter doesn't listen to anybody, including me. She does what she wants.*

IP: My parents were completely mystified. They were completely supportive, but completely mystified by my choices. That's what I would have to say. My mother was distressed at the idea of my wanting to be a teacher.

BS: *Well, in Holland, they were still a light year behind us as far as women's rights went after the war, and that's rubbed off on my wife.*

IP: Maybe they still are.

BS: *Oh, I don't know.*

IP: They are just north of the border, I've found.

BS: *Oh, Canada. I was born in Quebec. My father was a mining engineer. I'm almost Canadian. Yeah, there's a difference.*

IP: I go up and give a talk at the University of Victoria, you know, or something like that, and I haven't done it in recent years, but when I was younger, it was the same old stuff. The Deep South in this country is still like that. I always advise young women to stay out of the South.

BS: *Don't get me going on that. I went to Flight School down there.*

IP: Pensacola?

BS: *That's the only place you can go. Pensacola, Florida. Norfolk wasn't bad. Norfolk was overwhelmed by northerners from the Navy.*

IP: And all the services, actually.

BS: *Oh, yeah. So, anyway . . . mentor, the University of Washington. You didn't tell me who the name was.*

IP: Oh, Dr. Donald K. Reynolds. The late Dr. Donald K. Reynolds. He was teaching at the University of Washington and he had many old friends that were the same friends as mine from the days of working at SRI, so he knew. And he would visit me once in a while. He and his wife when they would come down to visit. And so he knew that I was finishing at the University of Washington. He knew that I was interested in a teaching career and he went to bat up here and convinced . . . I don't think he had a lot of trouble convincing the departments members or the department chairman that they wanted to

interview me, but they had a terrible time with the old Dean who was an old-time, hard hat civil engineer. He was within a couple years of retirement, at that time. And they had a hard time convincing the Dean that he wanted to interview me because it was the Dean who came down to Stanford to start the interviews and did some kind of screening process. Later, the Deans would have let their departments do that, but this guy must have been very controlling and he didn't. He had to have the first shot at it. So, he was coming down to interview, and he did not want to interview me, but he had been pressured so hard by the EE faculty at obviously the instigation of my old friend, Don, that he had no intention of letting me through his screen. But, he knew he had to interview me, so he did and before that interview, the Dean at Stanford, who in those days was Joe Petit - marvelous man. He later became President of Georgia Tech and that's where he ended his career. The late Joe Petit. He was an electrical engineer and he apparently took Dean Wesman to lunch before my interview which was scheduled for right after lunch, to work on him a little bit.

(350)

And before I went in to the interview, I suppose that the Dean had exploded all over Joe. Probably he had. But, he took my hand and he said, "Now, Irene," he said, "no matter what happens in the next hour, I want you to remember that you offer the University of Washington an opportunity, a tremendous opportunity. Don't lose the thought." Well, it turned out I needed . . .

BS: *This was who now? Petit did this?*

IP: Joe Petit, who was then the Dean of Engineering at Stanford.

BS: *OK.*

IP: So, I held the thought and it turned out to be an important thing to do. By the time that interview was over, there was no way I was going to the University of Washington where this man would have been my boss a couple of levels up. No *way*. He said the most outrageous things. He let me know right off the bat that there was no real interest here. He was just going to go through with it. And he said things like, "I assume that you're in electrical engineering just to get a husband."

BS: *MRS degree.*

IP: Yeah. Here I'd struggled through on my own dollar this long, hard program. And I remember by the time he said that, I knew I didn't care about the University of Washington and I made some comment like, "There are lots easier ways than that, Dean Wesman. If all I want is a husband, I don't have to get a Ph.D. in electrical engineering to do it." And there were other things. He said something like, "Does this mean that the faculty can't tell their usual jokes if you come up?" I 'd probably allow as how there probably wasn't anything I hadn't already heard, even though I might not say it, you know. It went like that.

And I had another mentor on the Stanford faculty - Bill Harmon, the late Bill Harmon - who was an electrical engineering professor and he was also running some seminars in human potential which he was also interested in. And I had taken one of those and become very good friends with him. And he had been an undergraduate at the University of Washington and he knew the faculty, he knew the school and he knew the Dean. And he said to me . . . I told him about this afterwards and he said, "Well, you know Dean Wesman is within two years of retirement, Irene. So, if you liked it there, if you go up for an interview and you like it, sort of set Dean Wesman aside and try to make

your judgment on other factors." Well, as it turned out, I was invited up for an interview, which means that the EE faculty again, probably at the instigation of Don Reynolds, had put more pressure on Dean Wesman. They wanted to interview me. They were trying to build up from what had been mostly an undergraduate program with an older faculty dedicated to electric power and not very much research and these were times in which everybody that wanted to be a major university had to get on the bandwagon.

BS: *You mean of ____ dams and that type of thing?*

IP: Oh yeah. And the local power and light companies. . .

BS: *Do you know the name Hank Shoemaker?*

IP: No. I don't know him.

BS: *He was in charge of the aluminum production board - not the board, but he worked for the board. He was the guy that was the field guy that put it all together. And he ran Alcoa, Reynolds and Kaiser Aluminum. During the war, you know how the war production _____ was like?*

(400)

IP: Oh, yeah, I remember.

BS: *And he consumed much of the electrical energy that was generated up here and after the war, he built the Trotville plant for Bill Reynolds. He and my dad were both top-notch*

mining engineers, metallurgists, really. He was a druggist. He died there. He was the biggest employer in Oregon for many, many years.

IP: These people were mostly consulting for the local power and light company in Bonneville, you know, like that. And they were not doing research. They were teaching and the university was going to escalate itself into a research ____ university, which it became. And they were very interested in hiring Ph.D.s in fields that were relatively new and from a status university. And so, I think the EE faculty had prevailed and the Chairman at that time, Austin Eastman, a wonderful man, he became one of my strongest supporters and mentors, too. They put the pressure on the Dean, and so I was invited up for an interview and I didn't have many interviews for the reasons I told you. I was invited to interview at the University of New Mexico which had 6 faculty at the time and wanted to build itself up, too, and by the University of Kansas, which was my home territory, which wanted to do the same kind of thing. And I've forgotten where else.

So, I had really very few interviews and when I went on my little tour to interview all these people, I did them all in a circuit and I went to New Mexico which I liked very much. I've always liked the culture, you know, of New Mexico. And I thought, just to live in Albuquerque, this might almost be worth it. But, it was like going into business for yourself, because they had so few faculty and there was no one to talk to in my area, which I would then have been expected to build. Well, I wasn't frightened by the idea of building it, but no one to talk to for a thousand miles was a little bit of a put off. I considered it and I went to the University of Kansas, where they were all in electric power and maybe they had seven faculty and it was the same thing. Both of these universities made me Associate Professor offers to start. So finally, in New Mexico, the only consideration there was just living in Albuquerque versus nobody to talk to. And Kansas, I had suffered terribly from allergies in Kansas. I would get asthma as a kid and

it went away when I left Kansas. And while I was there, my nose plugged up again and I thought, oh god, I don't really want to live in Kansas.

(450)

Then, I came to Seattle, and I got off the plane and it was a perfect Seattle day. It was April. Oh, the sky was blue, there were puffy clouds, there was salt-water, there was fresh water, there were mountains. It was so beautiful, it blew my mind. Mt. Rainier was out and my head cleared. And I said to myself, 'Well, talk to the people.' So, I spent a day with them and I really liked the people. I liked what they were trying to do and in those days and with that chairman, you could still say you wanted to teach. You had to want to do research too, but they presented themselves as a balance and I thought, that sounds good, because I did like teaching as a Stanford student. I liked it and I thought that was an important thing to do anyway. And I liked everything about it and I went back and talked to Bill Harmon again, and he said, "Irene, if you like it . . . " And they made me an Assistant Professor offer. And I said, "Does it matter what rank you start at?" And he said, "Really, the question you have to ask yourself is where do you want to be in six or seven years?" And if you get promoted once at two of these places, you'll be a full professor. If you get promoted twice at the University of Washington, you'll be a full professor. What do you want the ultimate to be?" He asked me questions like that. So, I ended up deciding that I wanted to come to Seattle and be at the University of Washington. And then I had to get myself finished. I was still trying to write my dissertation. It took longer than I had thought it would. So, by the time I actually got here, it was December of '61. I was still trying to finish the writing, but I had decided, by gum, I had enough. I could finish it wherever I was and I didn't want to stay as a graduate student in Palo Alto any longer. I wanted to come up here and get started. So, I came.

BS: *Went back and did your dissertation later?*

IP: Finished writing it after I got here, yeah. I actually got the degree in June of '62, so I got it done. But, it was a terribly hard go and after I was gone, I had a hard time getting my research adviser to read what I had written. He had 14 graduate students. You have to be an academic maybe to realize what that meant. In order to get any of his time and attention, you had to run through the lab at the same pace with him to even talk to him. So, after I got up here, I had a very hard time to get him to read what I had written, but finally, we got it together. I had to go down there more than once which I could not hardly afford to do.

BS: *How many graduate students did he produce?*

IP: I never knew. I don't know.

BS: I met Paul Ramsey. I've been lecturing in the winters . . .take a month off and go on lecture tours back and forth to Antarctica. A whole bunch of us do it. A lot of guys from around here do it.

IP: *Is that right?*

(500)

BS: *Oh, it's fun. You go in the bar every night. Drive Zodiacs around, and you give these very shallow slide shows that are awfully basic questions-type from people who have no background. But, anyway, he shows up. He's . . . Paul Ramsey was the Nobel Prize in Physics and knew all about _____ ____. And we really became good friends for the two*

weeks he stuck with me and I had him give lectures. So, it was for a general audience, but he's really good. One of them asked him, "What's the most important thing you've done?" And he says, "I created over 100 Ph.D.s."

IP: That's an enormous record.

BS: *He was a roommate of James Van Allen as an undergraduate. Started at the same spot. Anyway, we're really good friends. He's a member of the Polar Society. His only trip was on my tour ship. But, I really thought about that and I thought, that's really important. What you create that people can read and build upon.*

IP: So, anyway, I came up here and the first year, I was very unusual. They had never had a woman faculty member in engineering at the University of Washington before. And there was a lot of publicity about it.

BS: *You were the first.*

IP: I was the first. And I'm trying really to remember what it was like. But, we had heavy teaching loads in those days. We always taught two courses every quarter, and I think probably the first quarter, they probably let me just teach. But, before the first year was over, there was some pressure to get started on research. They didn't have the kind of equipment that I had been using at Stanford which was very expensive stuff - high powered tubes, you know, and linear accelerators and I was going to have to change to something else that was doable in that environment and try to build from that. So, that gave me some time to think about what would that be? And electromagnetic wave propagation was a thing that I enjoyed most and wanted to do something with. And microwaves, of course. I'd been trained in microwaves.

(550)

And it happened that my old friend, Don, and a research partner of his, the late Myron Swarm, had just gotten an Antarctic research grant from the Office of Polar Programs. Myron had an adjunct or an affiliate appointment, whichever it was, in the Department of Geophysics as well. And Don was an antenna man.

BS: *Don . . . ?*

IP: Reynolds. And they had gotten involved in this very low frequency project and building a 21 mile di-pole, twelve miles outside of old Byrd.

BS: *Tell me what you mean by a 21 mile di-pole.*

IP: Twenty-one mile di-pole stretched out on the surface of the ice when it was new with a little station to which the terminals came in, and a high powered VHF transmitter attached to the terminals, and a living facility.

BS: *Transmitter to what?*

IP: To the 21-mile di-pole . . . to the antenna, the di-pole.

BS: *I understand. Oh, I see, you transmitted out.*

IP: It was stretched out on the ice and in those days, and I'm talking 1961 or '62 here, when they had first gotten the grant, having it stretched out on the ice put it into a

physical environment that was also an electromagnetic environment about which there was only a limited amount of information available to the antenna community at that time. And what they wanted to do with it was to send high powered bursts up to the lower ionosphere. The overall project was to study the VLF properties of the ionosphere, which bounces them off. And when you raise the frequency to a certain critical frequency, which depends on a number of factors - it is a very dynamic situation, as you know - then the higher frequencies will go on through. But, if you send up bursts of lower frequency energy, and get them back on the ground changed in some way by the reflecting "surface" (lower ionosphere) you have a basis from which to learn something about the nature of that reflecting surface at that place and at that time. Very low frequency signals were being used at that time for navigation - LF LORAN.

BS: *Guess who talked to me just the other day. Dale Reid at Boeing. He put me on to you. I'd heard of you, but I didn't know where you were.*

(600)

IP: So, among the research they had done . . . they had an NSF grant out of Polar Programs . . . among the research they had done was to study the properties of this antenna laid out on the ice. And they also had built a transmitter and they were in partnership with Stanford on this. It was called Zeus. That was the name of the transmitter. You know, you name your favorite equipment the way people name pets, and some name their cars. They called this high power (thunderous) VLF transmitter Zeus.

(End of Tape 1 - Side A)

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(Begin Tape 1 - Side B)

(000)

IP: They named it Zeus and they were doing ionospheric research, but there was a lot more that could be done and there was a lot that was not known yet about how that antenna was really functioning in that environment. And I was interested in the project and I was interested in the fact that I knew how, with a graduate student, to make a laboratory scale model size of the whole thing and make some measurements. All they had was theoretical stuff and though it would not be a perfect reproduction, because you've got boundaries on any model you make, but it would give them another shot at understanding how the thing was working. And so, they were interested in my doing that and I wanted to do it. I was interested in their project. I don't think I can even tell you why. I think if I had it to do all over again, I probably would have taken geophysics instead of electrical engineering. But, when I was a kid who made decisions, I'd never heard of geophysics. I didn't know to do it. I sort of eased my way closer to it with what I did and knew as I could. But, Myron had a joint appointment or an affiliate or something with the Geophysics Department, so they were involved, in a way, in the project too, even though this particular grant was strictly in the EE department.

Myron was an electronics man, primarily, and Don was an excellent electronics man and an excellent antenna man. I never was an electronics person per se. It just didn't turn me on. But, I understood the antenna part and the possibilities for modeling the propagation and measuring, making antenna and propagation measurements. So, they were happy to take me on and I was happy to have something like that to do to sort of get started. And so, I got a Master's student and we built a laboratory scale model. But, you don't just model the sizes of things. You don't just have little thin wires that scale the full-sized antenna diameter, which is made out of cable. You have to model the entire

electromagnetic environment, and it is a fact of life that natural or easily obtainable materials do not come with convenient complex permittivity properties, so that you can just pull something off the shelf that will model ice, soil or rock at frequencies that differ by maybe five orders of magnitude. We had to mix and match and measure, and learn how to make something that would have, at a low microwave frequency, dielectric and loss properties close to those of the real ice at VLF. That is a very hard problem. You can't just find the right model material routinely in most cases.

BS: *Not anywhere but the polar regions, can you? Or in a lab.*

IP: In a lab.

BS: *You can't build a lab big enough.*

IP: No. But, you can put absorbing boundaries on it so that you don't get so much reflected from the boundaries of your model that you can't deal with it, you see. It's an approximation, but so is a theory. They're just different approximations of the same real world situation that you can't really duplicate exactly. That's what it was. And so, we learned to mix and match which is a messy thing. It's a good thing the student was good-natured and patient because we ended up mixing powdered graphite with a very, very fine silicate, or silicon carbon or silicon something . . . sand, it was sand. And we had to make a lot of measurements on that in order to get it right.

BS: *This is before anybody ever went, I take it.*

IP: Well, I think Myron and Don had had students doing the kind of measurements that they were doing with building the transmitter, laying out the antenna, doing theoretical work on the properties of the antenna.

BS: *They were already on the Ice.*

IP: They were already there. That's right.

BS: *Were they still year round?*

IP: Yeah, I think they had already started. Yeah, yeah .. . . they had.

BS: *Incidentally, I interviewed Dr. Elmer Friend, who was the OinC at Byrd the winter of '67, just the other day. He's down here.*

IP: Oh, really.

BS: *Of course, he starts talking about everything that was going on and "There were those two guys we saw about every month that were out at this long wire facility." And I said, "What's that?" and he was telling me about it.*

IP: It immediately got to be the Longwire Station.

(50)

BS: *He says, "I don't know." His was a funny story. He came at the last minute. He's a medical doctor. Ex-jet pilot. Korean War guy. I was ____ to be our doctor, and the OinC*

and the doctor got to fighting, so they fired them both. And since he had been a line officer, pushing sailors around and then a medical officer, they made him both. Hired two officers and got one. He's a pretty big guy. So, anyway, he mentioned it. So, here you are. You've got two guys wintering-over and you're experimenting back here.

IP: Well, the faculty never wintered-over. It was their students that did that.

BS: *Oh, I understand.*

IP: Yeah. But, see the challenge there was how many orders of magnitude . . . we modeled this at S band, which is 10 centimeter wave length. The VLF stuff, kilometers of wave length. So, you had to have that many orders of magnitude and yet have your electromagnetic environment be somewhat close at 10 centimeter wave lengths to what the full scale thing was at 10 kilometers. This was not an easy problem. But, we did that and we made measurements and the kid got a Master's degree out of it. And as I worked with it and worked with them and talked to their graduate students, I had more and more ideas about things that could be done. And at the same time, Myron was transitioning to administration. He became Associate Dean of Engineering and he was spending less and less time on it and I was supervising more and more of the graduate students. And it just eased into my being a co-principal investigator with them. And doing more of the work and writing papers and, you know, putting everybody's name on them and so forth. And they got their trips.

BS: *Myron and Don.*

IP: Both Myron and Don. The policy in the Office of Polar Programs at that time, and probably still is, the policy was that if you're going to be a PI on a project down there,

you had to understand the environment. You couldn't design effective things to be done there. It had to be research, which meant it couldn't be trivial. I had to have importance for polar research in a more overall sense. But, yet it had to be very rugged. And relatively simple to carry out because the logistics are so horrendous. And all that had to come together.

BS *Well planned.*

IP: Yeah.

BS: *You forget a screw driver . . .*

IP: You forget a screw driver, you haven't got a screw driver. So, it became obvious that . . . they had had their trips. All the graduate students . . . some of mine had wintered-over. But, I had not been and I wanted to go and my program manager at NSF, who was the late Ray Heer, he had the upper atmosphere program at OPP at that time, he wanted me to go. He said, "It's policy, and you should go." And the Navy controlled all the transportation, as you know, in those days.

BS: *Oh yeah.*

IP: The Navy didn't want to take me.

BS: *Deepfreeze didn't mind if you went. But, the Navy had bigger problems.*

IP: The problem I had was that Kelly Welch, Admiral Kelly Welch, he was the one that said, "She ain't going."

BS: *But, he was told what to do. The Navy was worried about being pressured into taking women on ships. And that was going on at the time. The Antarctic would have been easy to say, "Yes." That's a foot in the door, according to Kelly's boss.*

IP: Well, Kelly was awful to me.

BS: *He really was?*

IP: Oh, just awful. And I understand from Julie, when I talked to her that he's trying to reinvent himself and have her write him up as a person who was always enormously supportive of women. Well, he was not. He was awful. But, another . . .

BS: *Well, I know Kelly well. Yeah, he was one of those guys. Kelly just had a stroke. He's in a wheelchair. He's down in Tucson.*

IP: Oh, I didn't know that. Where does he live?

BS: *Tucson. He took care of Larry Gould for 20 years.*

IP: Took care of him . . . in what sense?

BS: *Well, Larry worked until he was like 80. And then he kind of had to have somebody do the housework and everything. Still brilliant, but he had trouble . . . worked until he was 98. And Kelly had retired and gone to work for Larry at the University of Arizona. He retired from Carleton College.*

(100)

IP: Carleton College. Is that in Wisconsin, or . . Minnesota?

BS: *Minnesota. He used to get Ike when he was President, two years running, to pass out diplomas. That's how forceful he was. Oh, I could tell stories on Larry that go on and on. But, Kelly went there to be sort of his co-aide the rest of the time. He wound up taking care of him for a long time.*

IP: How many stars did Kelly have?

BS: *Kelly has two stars.*

IP: I never knew at the time. I had no interest in such matters. Now, I've been on AMRAC and all that stuff. I know what it means, but then I had no knowledge.

BS: *Well, it's a terminal tour down there for NAV _____. The NAV ____ fill it, even when I had it. But, we ran out of admirals, so they start making admirals out of dentists and other things.*

IP: Well, Paul Gaffney got his third star, you know. Do you know Paul Gaffney?

BS: *No. I wish, I _____ Paul.*

IP: He's a wonderful guy. Wonderful man. He was CNR when I was on NRAC most of the time. He got his third star and he's president of the Defense University.

BS: *National War College.*

IP: Is it the War College? He is a wonderful man, an a tremendous administrator. Oh, he's good. But, anyhow.

BS: *Anyway, Kelly Welch gave you a bad time.*

IP: Oh my. He put up objection after objection after objection. And NSF really went to bat. They *really* did. I can never say enough about NSF for that. They tried to counter every argument that he came up with and they had me go to . . . they had an orientation session in the mountains every year in September for the people that were going that year. I've forgotten what it was called.

BS: *It was up at the Skyline Conference every year.*

IP: Yeah. And Ray told me, "What we want you to do is to go anyway as if you were going to go to the Antarctic, and you give the lecture on VLF research." Well, VLF research was broader than my expertise, so I had quite a time getting it together. And they said, "Admiral Welch will be there. He goes to these lectures and he will see that you are purely interested in your research. That you are completely qualified, etc. etc." And that will be the end of his arguments, they thought. So, I went and I gave the lecture and he didn't come. He wasn't there.

BS: *I never ever saw the admirals go to one.*

IP: He did. But, he didn't come to my lecture. He boycotted it. And there were so many different arguments thrown up as reasons why not and they even used the bathroom

argument. I mean that's so old, it has whiskers. But, they tried that too. How are you going to handle that? There isn't any on the airplane. Well . . . there isn't on a commercial airplane either, but they know how to handle it. They have a door. There was just one objection after another. And they even used poor Lois Jones and her group. They had them targeted because, oh, they had all kinds of reasons why their visit had been a disaster. They went in '69. And Ray had told me a year or more before this even started to have me really get there, he said, "Irene, what we have to do is get the first team of women in." And he told me who they were - Ohio State. And were they geologist?

BS: *They went out to the dry valley.*

IP: He said, "They will just go to the coast, and once we've gotten these women to the coast, and that's behind us, then we can get you in." Because I had to go to the interior. So, the objectors had all kinds of things, including that the women hadn't published anything. Well, nobody has after such a short length of time. The review process takes too long to get anything into print that they could have even been expected to have their '69 work in an archival journal. But, those kinds of arguments were used. And they were said to have been behavioral problems. They had been this and that . . .

(150)

But, finally, the point came when I had done my lecture at Skyline and everything was presumably about ready, and NSF had countered all the arguments. Oh, they had me write a proposal. No other PI had to write a proposal, have it peer reviewed and approved in order to get their trip. But, I did. So, I did it. I had decided on a project. I'd scoped it out. One of my graduate students, a Ph.D. student had gone down to the Ice the year before prepared to do that project so we could get on with our work. It's something we

needed to know. We needed to know the properties of the ice below the surface. That's another kind of remote sensing thing. We needed to know that in order to refine our data because nobody had been able to measure that below the surface up until that time. And the student went down the summer season before and he was programmed to have the equipment, everything, but for some reason he never got the equipment. He was never allowed to do the experiment once he got down there.

BS: *Do you think there was some subterfuge?*

IP: Darn right I do. I didn't at the time. No, I didn't at the time. I couldn't have believed such a thing as that. But, in retrospect, I think so. And so, that project remained to be done. It had been peer reviewed and had been approved, and that still hadn't done the trick. And the last thing that happened was that Admiral Welch said, "She has to have a female traveling companion." Well, there wasn't any Title Whatever at that time to fall back on except sanity. And you couldn't make a counter argument for it, really. So, at that point, NSF said, "OK, we'll get her a traveling companion." And the Admiral's stated reasoning was as follows, If she turns her ankle on the ice or becomes ill in any way and has to be seen by a doctor, it will be a Navy doctor and it's Navy policy that none of them can examine a woman except in the presence of another woman and there aren't any other women down there and therefore she can't go. So, NSF said, "You get on the airplane at the appointed time and we will get you a traveling companion."

BS: *Who said that? The Navy or NSF?*

IP: NSF, which had been told that that was the final condition and at some point in OPP, they had decided, "OK, we're not going to fight this any more, we're going to get her down there." So, they got a woman geophysicist from the University of Canterbury and

just before I was ready to go, they found out she had failed the physical. And Ray said to me, "You get on the plane anyway."
It went out of, what is the station out of Sacramento . . . former big Air Force Base?

BS: *Travis.*

IP: Travis. He said, "You go on down to Travis and you get on that plane and we will have this worked out when you land." And when I got on, I didn't know what was going to happen. And when I got off the plane in Christchurch, she was there to meet me and she was a charming young woman. She was a librarian and her husband had wintered-over at Scott Base and they were Alpine climbers. They belonged to the Alpine Climbing Club in Christchurch.

BS: *What was her name?*

IP: Julia . . .

BS: *It's in the book here.*

IP: Julia Vickers. Her name is different now. But, it was Vickers at the time. She and Ray got a divorce. She remarried eventually.

BS: *Ray Vickers?*

IP: Yeah.

BS: *I know Ray Vickers.*

IP: A Kiwi.

BS: *Yeah. Mountain climbing. Yeah. We used mountain climbers for survival camp. In fact, the guy that died on Everest that phoned his wife, froze up there, Roz Hall, he was our head guy. Very good friend of mine. In fact, all my cross-country ski gear he bought for me, picked it out. He used to take me up Mt. Cooke once a year. Dragged me up.*

(200)

IP: Well, it must be the same guy. But anyhow, he and Julia were married to each other at the time. And so she knew exactly what she was getting into. There was no question she could pass the physical and that she could handle everything and so the NSF Rep at Christchurch hired her to go with me. And she met me at the plane and we got along great.

BS: *Who was the Rep? Walt Bailey?*

IP: No, I can see his face. I can't remember his name. Chris somebody . . . he was the one on the continent, but there was a different person at Christchurch.

BS: *Phil Smith, on the Continent?*

IP: Phil was very much involved, but he wasn't . . .he wasn't in Christchurch.

BS: *Must have been Jim Zumberg.*

IP: No, I can see his face and I can't remember his name. But anyhow, they had got Julia and she had passed the physical and she understood what it was and she was ready to go. And I had with me a graduate student from UW who had wintered-over the previous year and who really understood the environment and the experiment and was an electronics wizard which I needed to have with me. We had a technician and all the equipment that we needed, knowing the situation. And some of the equipment the technician was carrying in a hand-carry box which was about that size. And he had it with him on the plane and we went first to Hawaii and overnighted - what's the Army Base?

BS: *Hickum.*

IP: Yeah, Hickum Field. And when we went back to Hickum Field the next morning to get back on the plane, the box was taken away from John, the technician, by whom I do not know. But, somebody who at least could represent authority to him told him he couldn't take it in the cabin of the plane. It had to go in the cargo hold. But, it would be there when we got off in McMurdo. And so it went into the hold, presumably. And when we got down there, it didn't come off. Wasn't there. And we had about 3 or 4 days there at McMurdo, maybe, waiting for a flight. There hadn't been a flight in yet to Byrd, so we had to wait for that and then we had to wait for the Admiral to go in because he had to go in first, and then we got on the plane. And the plane we took down was Lockheed built Starlifter . . . was it a Starlifter?

BS: *You had a 141 or you had a . . .*

IP: We had a 141. It wasn't a . . . Yeah, we had a C-141. But, the plane that took us into Byrd was . . .

BS: *Herc.*

IP: Yeah, it was a Herc. And we had an amazing landing on the ice outside of McMurdo. I think you probably read about it in here. Did you?

BS: Yes.

IP: Did you? Remember? That was wild.

BS: *Normal landing.*

IP: Well, it wasn't. Al had been there before and he was sitting next to me on the plane and he said to me as we were coming in for a landing, wearing all of our polar gear, and they're spraying disinfectant overhead and he said, "Now Irene, it's going to be a very rough landing and don't get upset. That's normal. It will be a very rough landing." Well, it was the roughest landing I ever had. And we went back and forth and finally we got to a stop and I looked at Al and he was green. And he said, "I've never had one like that before." And it turned out it was an Air Force pilot who had never landed on the ice before. It was his first landing.

BS: *Well, at some time or another, you've got to give them a chance.*

IP: You've gotta try.

BS: *Actually, what I insisted on when I was down there. They had some close calls. I'd say you can train your landings in an empty aircraft. I told the Air Force that. I said you can send somebody down here and they can fly around and around and around until they*

get it right. I don't want anybody landing coming from Christchurch never landed before because that's dangerous and that's stupid. And we always dictated that to the Navy guys. You don't practice nothing with anybody in the plane.

IP: And they'd had a plane crash the year before and the carcass was sitting out there somewhere.

(250)

BS: *That was Dave Eldridge and Co. That was the first one they ever crashed. Dave wintered with me.*

IP: That must have been a terrible blow.

BS: *You mean wintering with Dave? Yes, it was.*

IP: I didn't know him. But, having somebody you'd wintered with go that way.

BS: *No, no, Dave was the CO of VX-6 then. But, he wintered with me because he wanted to get out of the squadron. He hated this place and of course, getting locked up in the winter with him. I had to keep the men from murdering him. They would have . . . there were some ____ people that had homosexual tendencies that worked . . . .*

IP: I've heard all those stories.

BS: *All true. And they didn't like . . . everybody'd tell us they were homosexuals. Oh, what do you do on the ship when you need a girl and that's been going on for centuries,*

so they _____react to that. So, they knew how to take care of Dave and he was so bad when you're locked up for months. I'm sure they worried about him. I felt badly for him. So, anyway, you had a hard landing.

IP: Very hard landing, and we had a few days at McMurdo waiting and then we were allowed to go in. And of course, we were curiosities, Julia and me. She handled herself like a pro. Absolutely like a pro. And she was only 27 at the time. I was 45. I looked like Mama to them. And they just wanted to talk, that's all. You know the kind of thing that the Admiral had been suggesting we were going to do and be down there was ludicrous. But anyhow, when we finally got to go in, it was a very overcast day. It must have been kind of borderline by the time we landed. Must have been. And we got to Byrd and then we're driven to the entrance which was black with soot and had that sign over it that said, "Abandon hope, all ye who enter here." You know, it was a very old station then. It was abandoned not too many years after we were there. And the walls of the Quonset huts were popped away from the floorboards and the floorboards were tilted and icy. Oh, it was not an attractive environment at all. But, we were the first to come in after the Admiral and the cook had just gone all out to make dinner for us with the supplies that they had. Baked a cake and all kind of things and we were quite a curiosity. But, after we had had dinner with them and had celebrated the fact that we were there, and we were on our way to Longwire.

When we left for Byrd, our box had still not come in. And the people were saying, the NSF reps and all that, they were saying, "It going to be here. It's going to be here any day. We're turning the route upside down. We're going to find that box, Irene. And when you get in there, you have to do your experiments. You must not fail." Chris said to me, "If you fail to get your data, there won't be another woman on this Continent for another 10 years or a generation." There was entirely too much pressure. I mean, I had

enough pressure. I was exhausted from all the planning by the time I even got on the airplane.

BS: *High altitude?*

IP: The high altitude bothered me.

BS: *Remember the altitude at Byrd?*

IP: 5000 ft. A mile.

BS: *Equivalent to 7000. Pressure altitude's lower because of centrifugal force.*

IP: But, it bothered me at first. And in retrospect, I think the pressures I was under, the things that were being suggested to me . . . I think of it as a cartoon of how things were for women. An exaggerated cartoon of how bad things were for women in most situations in a male-dominated environment.

(300)

But, there wasn't anything I could do about it. And so, the box still hadn't come in, but we got in the SnoCat and we rode 12 miles in near white-out conditions, hugging the flags.

BS: *You didn't stay over at Byrd.*

IP: No, we went right on out. And, of course, by that time, it was very late October, nearly the first of November, so the sun was out all the time. It was so overcast that we

couldn't really see, but it was just light all the time. And the overcast was heavy and we drove very, very close to the flags on the side of the path. And when we finally got to Longwire, there was nothing on the surface. Our station was buried 25 feet under the ice just from the accumulation. It had started out 5 years before on the surface and now it was 25 feet under. There was nothing on the surface except a communications antenna tower and a mound of snow and the American flag. That's it. And it was quite a sight to see. And so, what you had to do to get into the station was to walk across the ice surface, get your balance any way you could on this mound - this icy mound - and they had built a ladder - a gerry-built ladder from the surface down to the base of the floor. Rather, they built it from the bottom up because whenever they needed a new rung, somebody young with long legs just tacked one on. And there was nothing coming out to hang on to to get your balance. You just had to get hold of it somehow, get your foot on the first rung, and keep your balance and not fall 25 feet to the floor. And that was quite a challenge for me, you know, a little old lady with short legs and all that heavy clothing on. I did it, and I went down the ladder and of course, the rungs were too far apart for my short legs in those boots and all of that, but I got down. Got down to the bottom. And there were two guys there who had wintered-over. One was one of our graduate students. The other was a Holmes and Narvar mechanic who was there to keep the generators running. And the two of them had not gotten along, so they'd had a hell of a year. That can happen a lot, I think. They were reasonably glad to see . . . the mechanic was not. He was just surly and ready to go home. The graduate student was mighty glad to see us. And we all got down there and we were assigned to our . . . there was one little room with bunk beds in it and it had been previously decided that Julia and I would have that room. And Julia immediately graciously said, I'll take the upper bunk, which was a good thing since she was an agile young tall girl with long legs, so she was happy to do that. The room was so small, you could hardly turn around in it. You had to go outside to turn around, almost. And Al, the graduate student, made up a duty list because we knew that Tom and the

mechanic, whatever his name was, I don't remember any more, they were going to be taken out very soon after we got there. We were not all there together very long.

(350)

So, Al made up a duty list and the duty list was snow shovel, cook and wash dishes. And by that time, I was suffering badly from the altitude. I had a nosebleed off and on, and my head ached and I looked at the list and I said, we've got to face facts here. If I try to shovel snow in this condition, they're going to take me out of here on a banana sled and we can't afford that. So, Al said, "You're right." And he redid the duty list and I had extra cooking and dishwashing. And that was all right.

BS: *Are you a good cook?*

IP: Yeah, I am. Powdered eggs and powered milk and no fresh vegetables is not easy, but yeah.

BS: *Could you cook with powdered milk?*

IP: I learned. You bet I did. And we had a mix to make our own bread. You can imagine. And a mix to make our own ice cream. Oh, yeah. And there were so few people in this little station, and yet all the canned things were Navy supply size. A can of peaches was this big. And they were all frozen solid up on the roof of the Jamesway. But, let's see . . . where was I.

BS: *You're just getting there, you're just getting going.*

IP: And the box still has not come. And we were tightly scheduled for the equipment, the SnoCat, you see. And it was very, very clear. When your time is up on the SnoCat, you turn it over. You don't argue.

BS: *Somebody else needs it.*

IP: Somebody else needs it and that person is going to have it and you are not.

BS: *All the people that go out on an oceanographic ship, they all want the ship. The whole ship.*

IP: The question was what are we going to do? And Al said, "Well, first thing we have to do is go to a site where I buried some cable that we need and we'll go there and we'll get the cable and it will take all day. Maybe it will come in tomorrow." So, we did that. Al and I went out and he knew exactly where to go and the fact that there was nothing on the horizon didn't faze him. He knew what to do and where he was. So we went out. My feet nearly froze in the bunny boots, but we went out and got it. Got back and the box had not come and the pressures are getting more intense. You must not fail, we're doing everything we can to find your box. There was something crucial in it - crystals and batteries as I recall, and there was no way to get replacements. Not at Byrd, and not at McMurdo, either. And so, we stalled at least one other day, I remember. And then a Stanford graduate student named Ev Pascal - god love Ev Pascal - he was the senior scientist at Byrd, but he was a graduate student. That's the way it was down there. They were all young. And he was from Issaquah, Washington, as it turned out. He had gone to high school there. Where my grandsons live. But, he came over to visit . . . just to visit. . . . and he immediately saw what our situation was and he said to Al, who was the designated electronics wizard, he said, "I've got a synthesizer." It was a crystal. That's

what it was. It was a crystal. And he said, "I've got a frequency synthesizer over at Byrd that won't work for you in it's present configuration, but you could modify it and if you want to do that, you can borrow it." Did we want it? My god, did we want it. So, we spent another day going over to get that. And then we spent yet another day in the little electronics lab.

(400)

BS: *Was that it? Was that your equipment?*

IP: Yeah, that was the loop antenna. That was the receiving antenna. This was the little electronics lab, yeah. And I worked for Al for a day in the electronics lab. He told me what to do and I did it. I could have eventually figured it out, but it would have taken longer than we had. Al knew exactly what to do, so we did it and the technician worked with us, too. And we got that done. I can remember during those first nights . . .

BS: *So, you accomplished what you wanted.*

IP: We did. We did, thank to Ev Pascal, and Stanford and Al's enormous talent and my . . .

BS: *Al?*

IP: Al Chandler, the graduate student. Yeah, we all were a team. We all worked together.

BS: *Didn't you have a radioman, a radio technician at Byrd?*

IP: We had a technician, we had the one we had with us, but we didn't have anybody to . . .

BS: *I mean ____ maintained radios at Byrd.*

IP: Yeah. Oh yeah. We had a lot of radio communication, but we didn't have this crystal which we needed to convert.

BS: *The reason I ask that is a lot of these guys are marvelous and over the years the marriage between a sailor and a scientist that's got a problem was a wonderful experience. They saved science a lot of times.*

IP: Well, Ev would have known it. If there had been anything at Byrd, he would have known it. The only thing he knew would save us was the synthesizer that he loaned us and we worked like beavers to get that thing ready to go. Then, we put all our equipment together. We had a loop antenna which we were going to drag along the base line. See, here's the antenna, here are the terminals and here's the baseline. We had a theoretical model that a different graduate student of mine had worked up that would tell us if we made measurement of the magnetic field along the baseline at specified intervals, his theoretical model told us what we ought to expect and he had designed the model in terms of the complex permittivity of the ice. So, that would be our unknown. When we got our data, we would put it into a computer program and run it and run it with different combinations of parameters until we got a match. It's a very old fashioned, brute force technique and it's the kind of thing you had to do in the Antarctic.

BS: *So, you modeled it and then you had to match the model.*

IP: That's right. We had to match our data points. That's what we did. And we couldn't do that until we got home, so we had to take a lot of data. And we couldn't cover the entire frequency band. We wanted to get the whole VLF band, but we couldn't get it all because at one end of the band, this component would choke and at another end of the band, something else wouldn't work exactly as it should. We got a lot of data. Ultimately, we had three or four papers in *Radio Science* and one in *GeoScience* and *Remote Sensing.* But, anyhow, to make a long story short, we put it all together and we had to work 12 hour days by that time. And we couldn't work every day because sometimes we'd pop up out the top of the ladder and it would be a white-out and we couldn't go.

BS: *Unless you had a rope.*

IP: You'd have to have an awful long rope, because we did a very long baseline. Well, we didn't have it. Maybe we should have, but we didn't. So, we worked when we could and we worked 12 hour days and we did our other jobs and Julia went out of her way to take the load off me. And the equipment was still not coming. I was still getting the same thing, "We're turning the route upside down. We're going to find it, but we haven't found it yet. You must not fail." Always coming at me all the time. And on days when we could work, if I had cooking duty or something like that, she'd take it. Other times she drove the vehicle for us. I couldn't drive the SnoCat. My legs were too short. It was too far to let the clutch out and all that. So, Julia would take any duty that I had that she could do. And sometimes the technician would drive the vehicle. Normally, either Al or I would read the data and call it out and the other would record it because we could tell if the data was shaping up or if there was a glitch. We didn't know what to expect, but we knew . . . you expect to get some kind of, how shall I say, point by point approximation to smooth data over a reasonable length of time, using a base line and with reasonable changes of frequency. We had to do it over and over at all the different frequencies. So, we did that

and when the time came to leave, they brought in a plane to take us out and our box was on it. Now it had been suggested to me earlier that we'd been sabotaged and I would not believe it. When I saw it come in on the plane that was programmed in to take us out, I figured there was nothing to be said about it at that point. Live with it, get used to it, but surely this is not coincidence. What would you think?

BS: *It was sabotaged.*

IP: Yeah, it was.

BS: *I would have had an investigation.*

(500)

IP: Nowadays, you would have an investigation, but . . .

BS: *I would have had an investigation for sabotage, not for missing anything. Line up the sailors and have them, you know. It might have come from the top.*

IP: It might have. I never asked those questions. It was still 1970.

BS: *You'd gotten your work done.*

IP: I got it done.

BS: *OK.*

IP: And, in fact, everybody back at McMurdo, when we got back there, knew that we had gotten it done and Dr. John Katsufrakis was there and he said to me, "Irene," he said, "You did it. You are standing 1000 ft. tall in the Antarctic." And I never forgot it.

BS: *Couple of questions. Were there any other groups with lady researchers down there that summer? Was Mary Alice? Did he come?*

IP: To the best of my knowledge, she didn't. She would have been on an oceanographic . . .

BS: *But, she wintered-over eventually.*

IP: I'd say, no, no women had wintered-over yet. In fact, when I went . . .

BS: *Nobody had spent the summer either, is my question. Was there anybody there that summer?*

IP: To the best of my knowledge, no.

BS: *OK. You were the first - I just discovered this - to go out there and integrate with the men because Lois Jones and her people went out to the dry valleys in an all women camp. Now, I was the helo officer when I was there, but not during her time. But, those helo guys took better care of that camp than any camp in the area. George Denton told me who had been out there for years by then, and he's still going out there - he says, "They short changed me." They had booze, they had cakes.*

IP: In order to really nail it down, you'd have to qualify it this way. I was the first American woman - I didn't know at the time, I've learned since the Russians didn't have any women down there. They just wouldn't admit it at the time - but, I was the . . .

BS: *They had them on their ships at the very beginning because Gordon Cartwright, who was there, during IGY I and Mort Rubin, both said they were on the ships. They've always had women on the ships. Not the Navy ships, but . . .*

IP: They weren't at Vostok, they weren't at , you know . . . I was the first American, or first woman scientist or engineer to live and work in the interior as a PI. There had been some women that I was told about but didn't meet. . . I think at least one other was a penguin biologist who lived there with her husband working with him. He was the leader and she cooked. I don't know. They were from Utah State.

(550)

BS: *Yeah, I know who it was. I'll think of the name.*

IP: But, she was with him, wherever they were.

BS: *Crozier.*

IP: Crozier. They were not in the interior and she was not a PI, or co- PI, so you have to qualify it that way to say I was the first in anything.

BS: *She was with her husband and they were out there alone.*

IP: Were they? I've forgotten.

BS: *I'm sure they were sure they were alone in the Quonset hut we had out at Crozier, yeah. And I know who they are. But, you were the one that integrated Byrd Station. You integrated the Longwire and you're out there with men.*

IP: That's right. I was. Thinking nothing of it except just please God . . .

BS: *With strange . . .*

IP: Not all friendly.

BS: *No, I don't mean strange, I mean you didn't know them before.*

IP: No, that's right.

BS: *Everybody's strange that goes to the Antarctic. At least I was told that. That's good. So, anyway, you're back in McMurdo.*

IP: Yeah, we're back in McMurdo. Oh, getting on the plane was a difficult thing for me. I didn't know they didn't turn the engines off. The plane is just sitting out there idling and we're running out as they're loading equipment on. I had this sense of being the leader of the group that I should get on last. Well, the plane starts rolling and they had left this ramp down at the bottom and the ramp . . . we hadn't quite started up yet and Al took hold of my hand and pulled me onto the plane as it was picking up speed and the thing was coming up and he pulled me on.

BS: *Did you leave a winter-over group or was that the end?*

IP: That was the end. The Seabees came and dug up the station and took all the stuff to Siple for the next year. And Ev Pascal was going to be the first science person at Siple, the guy who was at Byrd that year. He came over more than once when we were there to talk to us about . . . you know, he was thinking things like how do I get out if thus-and-so happens. You can't walk anyplace from Siple, you know. He talked a lot of his concerns through with us.

BS: *Well, I can tell you all about that. I used to have to close Siple out for the winter.*

IP: Did you.

BS: *And Pole. And I made sure that we kept a plane available to fly from California to Siple or Pole . . something, a Herc. It wouldn't be like the Air Force and this doctor who.*

IP: Oh, yeah, I've got her book.

BS: *Well, that's all a bunch of BS.*

IP: Is it?

(600)

BS: *The Navy would have just gone and got her. The reason I say that, when I took over . . .*

(End of Tape 1 - Side B)

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(Begin Tape 2 - Side A)

(000)

BS: *This is Tape 2 with Dr. Irene Peden and the date is 8 May 2002. Dr. Peden, you've just come from the interior of Antarctica at Byrd Station to McMurdo, and you discovered that your equipment that you'd been missing all of the time you were there was in the plane.*

IP: In the plane that came to take us out. That's right. We got back to McMurdo and we had to wait three or four days for a flight back to Christchurch and during that period, while we were at McMurdo, we visited people doing other kinds of experiments. We went out on the ice. The ice was breaking up by then and we went out on the ice.

BS: *This was what, February?*

IP: No, it was the end of November.

BS: *Oh, really.*

IP: Oh, yeah. They couldn't use it as a runway any more. And there were big leads in it and we went out and looked at the seals and talked to the research biologists who were studying them, and hopped right over those leads and in retrospect, my hair stands on end. But, we didn't think a thing of it, we just did it. And I remember some biologists

who were studying . . . diving with the seals. And in their hut, they had a hole right in the middle of the floor that was where they dived. And we went out and visited them.

BS: *Bob Finney?*

IP: I don't remember their names.

BS: *Art DeVries?*

IP: They explained to me how the did it. What it was like. What their suits were like. It was a lot of fun. And we wanted to go to the Pole. If there was a plane going and there was room, you could go to the Pole, but we were not allowed to go. Admiral Kelly had issued an edict, we were told, that we were not to go to the Pole.

BS: *He took Jones and company.*

IP: Yes, he did, and apparently, he didn't want to do that again. He'd been there, done that. The decree was, we were not to be able to go. And we questioned it and we were told that he had said it. If it's really true, it was a rotten thing to say. Julia was a Kiwi, and he said he wasn't going to take any damn foreigners to the Pole. Well, they took them all the time. It was not valid. But, it was just a mean thing that somebody had decided this was the way it was going to be. So, we never got to the Pole. It's one of my great sources of mourning to this day, that I was so close and couldn't go. God. But, anyhow, we visited other scientists doing other kinds of things. We learned about what they were doing and I think that's where I met Ted Rosenberg. He was coming in as I was going out. I can remember being out on the ice with him and all the stuff palletized that was his

that was going to go in and getting acquainted with him. We were both much younger then.

BS: *Ted was at our house last August. He stayed with us a couple of days.*

IP: I crossed paths with him, I think once when I was on the Polar Research Board. We said hello and they wanted to have something reviewed that was strictly, directly in his area and I remember saying you should ask Ted Rosenberg to review this piece, not me. But, anyhow, we got our data and we couldn't go to the Pole, but we amused ourselves in other ways and I thought of other experiments that could be done, that would be kind of neat to do, and all kinds of things.

We got back to Christchurch, finally. The plane that took us out to Christchurch was a Herc, and Admiral Welch was on it. And he wouldn't talk to us. He went up - I don't remember the right words for things - but , he was up where the pilot and navigator were and he stayed there.

BS: *He didn't invite you up to look?*

IP: No. No. He didn't speak to us at all. He was so rude upon departure that the Navy guy who was the mayor of McMurdo, apologized to me for it and I know, even then I knew, that they don't do that. But, he did. He felt so bad about it all. Anyhow, we went back to . . .it was a very long ride, perched in that little canvas seat.

BS: *8 hours.*

IP: Oh, god, you know. It was a tedious ride, but when we got off the plane, it was 93 degrees in Christchurch. It was December by then, the first part of December. And in all

that heat, there were Christmas carols playing and plum puddings in the windows. It was a most unique experience. But, the first thing I did that night, I went back to the hotel and after I'd checked in, I went out and I bought all the fresh fruit that I could carry and I took it back to the hotel and ate fruit until I was choking on it.

(50)

BS: *I ate lettuce.*

IP: Did you? I wanted fruit. And even though I was exhausted, I made myself stay up to see the dark. I hadn't seen night for so many . . . 6 weeks or something like that. I had a long layover in Christchurch, too, because there wasn't a plane to take me back through Hickum, and when I got to Christchurch, Ray Heer was there. He was on his way in as Program Director and I remember sitting in a bar with Ray that one evening and he said to me, "It would be awfully convenient for you to book a commercial flight and just get to Hawaii," but he said, "Please, Irene, please don't do it. Go along with all the arrangements that have been made for you. Don't depart from them, please." So, I said, OK. So, I took tours. I went to Queensland, you know, and did all kinds of . . .

BS: *Kelly's aide was John Clark. Did you see John Clark?*

IP: I may have. I don't remember.

BS: *John was in VXE-6 with me and then wound up being Kelly's aide later. I know he didn't feel . . . he's a champion of women's right. That must have been tough on John. But, Kelly, of course, with all the public affairs that he put out made himself look like the champion.*

IP: No.

BS: *OK, you flew back in a 141, I take it.*

IP: Um-hmm.

BS: *I don't understand why. It's just that you had to go through the process.*

IP: That's what had been scheduled for me and my program officer pleaded with me to do what they had me scheduled for. But, I had also told them in advance and they had it worked that Leo was going to meet me in Hawaii and we were going to have Christmas vacation together, so that was understood after I got back.

BS: *Did you . . . you wrote your research up, I guess.*

IP: Absolutely.

BS: *A paper and all that . . .*

IP: Several.

BS: What was the fall-out of this? Were there follow-on experiments out at the new Siple?

IP: Well, there were some interesting things. I don't think anything came out of Siple that I was aware of. I'm sure they used the numbers that I had gotten, but what we did resulted

in a bulk average value for the whole ice sheet which was several thousand meters in depth and the properties change as a function of the pressure, temperature, position, all that. We couldn't . . . we didn't have access to that kind of information at that time. But, what we got was a bulk average value because at VLF, the depth of the ice sheet with those properties just happen to be about a quarter of a wave length, which is, in electromagnetic terms, rather thin but significant . So, we could do a later calculation once we found out what they were as a function of depth. We could do a calculation and it turned out we were very, very close with our bulk average value to what you would calculate if you knew what they were at various positions. We knew what the bottom probably was because of some seismic data . . . interpretation of some seismic experiments that had been done with a ground vehicle before us. We knew that it was very rough down there. It's mountainous underneath. We knew that. But at VLF, we could make a wash out of that because the individual variations were so short in terms of the wave length that you could wash it out and it didn't make . . .

BS: *I see. Yeah.*

IP: So, we had a reasonably valid assumption that we had parallel surfaces that were horizontal. And that was important to our being able to do anything theoretically. We knew we were OK on that. We knew our ice was electromagnetically not terribly thick and we were able to make these calculations and interpret our data in terms of bulk average values. Well, a different graduate student of mine, later went down to Byrd where the New Hampshire . . . s people were drilling the first deep drill hole all the way down to the bottom.

BS: *Tony Gow.*

IP: Tony Gow, you bet.

BS: *Tony's been around a long time.*

IP: No, it's Steve, Steve what's his name, is the GPR man now. Anyhow, he was doing that kind of thing too. But, CRREL was down there, and my student communicated a lot with Tony Gow in order to put his experiment together. And what he did was to put an instrument package down the drill hole. The instruments were housed in the cylindrical brass tubing that served as an electrically short dipole antenna. The very short dipole model permits a lot of assumptions that simplify the theoretical problem, and still remain valid assumptions at VLF.

(100)

He put the electronics at the terminals of his short dipole, and winched the whole thing down the deep drill hole at Byrd.

BS: *Oh, he did.*

IP: Yes. And he interpreted the input impedence data that he got for this receiving dipole in terms of the properties of the ice surrounding the bore hole. It was a difficult experiment to do because the deep ice was sliding out from under all the time, and the drilling fluid had to be accounted for, but he was able to do this in his model, and we published that, too. And he was able to get these interpretations of the complex permittivity again as a function of depth, and correlate it very strongly with temperature profile. And, they got up wet granite chips from the bottom so we knew that our assumption that we had made in the earlier experiment, that we could use the properties

of granite to represent the deep undersurface which then went to infinity in our model, but the model was OK with that. That there was pressure melting at the bottom, which the glaciologists assumed or knew. And it was true. And when we took . . .

BS: *So, they brought this back and you . . . he was one of your grad students.*

IP: Yeah, he brought it back. he went down.

BS: *That was after you were there.*

IP: Yeah, afterwards. He had also wintered over at the station where I went, but he went back and it was a summer project to go down the drill hole with his instrument package. But, he did that and the APL people helped him design it so that it would withstand the temperatures, the drilling fluid (ethylene glycol) and all of that kind of thing. And he had a double degree in glaciology and electrical engineering.

BS: *What's his name?*

IP: Jim Rogers. And then he went up and taught at the University of Alaska for some years. And he eventually wore out on the politics of public education in Alaska. Politics related to the oil and all of that. And then he went to Michigan Tech in Houghton, Michigan. He grew up in Alaska. He's a person who needs to live in those kinds of surroundings.

BS: *He had a double Ph.D.?*

IP: He got a Ph.D. in glaciology and electrical engineering and Ed Lachapelle, I think, was his doctor-father on the glaciology side. I think it was Ed. But, Jim had made a contribution to glaciology as well . . . that was fun to be able to put that together and to publish that that had been done.

BS: *So, you're work . . . how did the fact that you went affect you later on, professionally, personally . . ?*

IP: Well, it's in a lot of my citations. I've received a lot of awards and citations of various kinds. It frequently is in them for doing that work

BS: *Going off to Antarctica.*

IP: Yeah, pulling it all together. It's the scientific work, the National Academy doesn't elect you because you went to Antarctica. You have to have a citation that reflects something technically meaningful that you did that the Academy needs to see. But, it's hard for me to imagine how the scientific community would be using it now, because I don't think anybody's using VLF for communications or navigation any more. But, another thing we did later and we needed our data to do it and we did it - yet another graduate student - made a model of global VLF propagation and he needed the Antarctic and Arctic pieces of it, the propagation paths over ice - the ionosphere up here, ice down here. He was able to use those numbers to predict what kind of reception you'd get at a far away place and that kind of thing. He did that. Now that LORAN is out the window, I don't really know how they would use it now. I couldn't . . .

BS: *Let me rephrase the question. How did the fact that you went there affect you on a personal basis?*

IP: On a personal basis.

BS: *Did you join the Society of . . . ? Well, you already said you . . .*

IP: I was elected to the society . . . what is it? I eventually resigned because I didn't get anything out of it except a big dues bill every year. The Explorer's Club.

BS: *Oh, the Explorer's Club.*

IP: As a fellow. I was elected as a fellow.

BS: *Yeah, I'm a fellow in the Explorer's Club. I've been for 25 years, but I don't go to their meetings. I'm a Life Fellow, so I don't have to pay any dues. I don't have to worry about it. My daughter joined.*

(150)

IP: The dues are very high.

BS: *Yeah, it's stupid.*

IP: They're very high and they regularly provided a magazine that was no better than the *Smithsonian* magazine that I get as well.

BS: *There are so many fewer explorers in there, in the Explorers Club, than there are in the American Polar Society, I'll guarantee that.*

IP: I eventually just turned it in.

BS: *My daughter did too. She joined. She wanted to join, so she did it. So, what I asked is, I usually get an immediate reaction from some people. Sayed el-Sayed, the Egyptian that made 23 trips to the Ice on the ships, he said, "Oh, when I discovered the Antarctic, it changed my life." But, he went every year for years. And it was his life.*

IP: It was never my life. I certainly had a different perspective on Earth as a planet and as a place in the universe. Up here, at these latitudes, the sun comes up, the sun goes down, you're aware of changes, seasonal changes, but you don't really think about it in terms . . .you think in terms of the spin, but not the orbit. And you get down there and you have a whole different sense of where you are on the planet, I would say, and what the planet is. I have a very different sense about it and it's stayed with me. I wanted desperately to go back. I did go back last January as a tourist on an Elderhostel cruise.

BS: *Which ship?*

IP: It was the *Polar Star.*

BS: *You went on the Polar Star.*

IP: Yes. It was Elderhostel.

BS: *This is this last January.*

IP: This was last January.

BS: *It was my first year in the last eight that I haven't gone and taken the Elderhostel group.*

IP: Is that right? Our leader lives on one of the Canadian Gulf Islands. His wife is a marine biologist who specializes in orcas and he . . . Dennis, he describes himself as a naturalist.

BS: *Canadian. It's a Canadian?*

IP: They're Canadian.

BS: *Yeah, I went with Marine Expeditions out of Toronto and we always got an orca guy out of that group that studies orcas up there. There's all kinds of them.*

IP: I could get their names. I've got the albums right over there.

BS: *The former Skipper of the Polar Sea is over in Bremerton and he goes with . . . but isn't that fun? I drove Zodiacs and . . .*

IP: Most of them were very young, very athletic kids. Norwegians or Germans. It was . . .

BS: *I know all of the guys.*

IP: You may.

BS: *You worked out of Ushuaia?*

IP: Yes.

BS: *We went back out of Ushuaia. My wife got to go for free and she got tired of it. She'd come for a cruise or two and I'd stay for a month.*

IP: They didn't all enjoy it. I'm not subject to seasickness, so I'm . . . I was subject to not being able to keep my balance in the Drake Passage, but I went with a college friend who lives right across Lake Washington from us. She was an aeronautical engineering student at the University of Colorado, where we were both undergraduates. She held or pulled me up when I needed a hand. She is physically stronger than I am, and her knees have held up much better than mine - a consideration with keeping your balance in rough water.

BS: *Did she get in at Vernadsky to see their station there?*

IP: No. We saw it from the ship.

BS: *That used to be Faraday. It's a nice stop. So, you didn't get into our station at Palmer.*

IP: Yes, we did.

BS: *Was Polly there?*

IP: Polly wasn't there.

BS: *That's Polly's station.*

IP: I'm sure it is. Polly wasn't there. I've met Polly, but she was not there at the time. Esther Rothblum, a friend and clinical psychology professor at the University of Vermont, applied for a grant to go to the Antarctic in connection with a book she wanted to write about women in the Antarctic. Polly eventually gave her enough money to do the interviews for the book (*Women in the Antarctic*, Rothblum, Weinstock & Morris, Eds.), but she never got to go. Terribly disappointed. But, no, there were a lot of women there - the physician, the station physician was a woman. There were a lot of women scientists there, and we were. . .

BS: *See what you started.*

IP: What I started. The fun thing about that was that when we got there, we were told that each of the cruise ships is allowed to go once to Palmer during each season. And for the *Polar Star* last January, this was the one. A wonderful coincidence, from my point of view.

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And so we went to Palmer and before we went in, we were anchored off the station site. It happened that the Antarctic Station Manager was there, so he came on the ship and gave us a lecture on Palmer, its history, and the work being done there. My intention had been to go on the Elderhostel cruise simply as a tourist. I wasn't going to say anything about having ever been to the Antarctic. I was just another . . . .

BS: *Was it Brian Stone?*

IP: No. His name was Dick . . . ? Bresnahan or something.

BS: *Dave Bresnahan.*

IP: That's it. He came on the ship.

BS: *Dave flew into Antarctica when I wintered-over. Remember when I told you about that flight. He's been involved since.*

IP: Well, Dave was at McMurdo when I was in 1970, and by the time he came on the *Polar Star* to give this lecture about Palmer, my college friend had ratted me out and they all knew who I was or what I had done. So, the Elderhostel guy at the head of it, what do you call it?

BS: *Expedition leader.*

IP: Expedition leader. He told Dave that Irene Peden was on board and he remembered. He remembered the whole thing about the equipment. He probably knows more about it than I ever will. But, he remembered all that. And so, we had our tour of Palmer and he was always surrounded by people, so I never got a chance to talk to him personally, but when we got on the ship and had headed out again out to sea, out of the blue, the expedition leader said, " I have a presentation to make, at the request of the NSF leader at Palmer Station," and he gave me a painting.

BS: *Dave did.*

IP: He gave it to our leader. He gave it to Dennis, that was our leader's name. And he said he wanted him to make this presentation to Irene Peden. So, he did. And it's a beautiful painting of Palmer done by a woman artist who was there.

BS: *You have it here?*

IP: Yeah, on the wall in there, along with my photograph of the Peden cliffs, which I'll also show you.

BS: *Painting . . . ?*

IP: It's a painting of Palmer Station, watercolor, done by a woman artist and Dave . . . I had some e-mail correspondence with him afterwards to say, "Thank you," and among the things he told me was that he made a point . . . he happened to be at Palmer when we were, but he does the job for NSF at all the three stations. He said he keeps a very careful track on the population statistics in the Antarctic stations, and makes sure that 25-35% of the station personnel are women every year.

BS: *He works for Eric Chang and he gets tabbed as the senior US Rep to Antarctica still. But, the senior US Rep now means something because the Navy's gone. And they take turns doing it. He does it, Dwight Fisher does it - used to be Skipper in the '60s. My son-in-law does it, Brian Stone. He's 32 years old and he's being groomed for bigger and better things. He finished at Duke and went down as a snow-shoveler and stayed and married my daughter. They went for 3 years together, and he goes to Senior Executive Service School in June. They're all getting old. Dave's getting old. Dave was 18 when he came in 1967 in the middle of winter as a diver for Jacques Sanibel, that whole ___- and*

they went driving out on the ice. Of course, Dave told them not to with a big tractor. With all of their experience, broke it through the ice and it's down in Barrow Sound today. There was no research so Dave sat on his fingers for . . . Jacques and others until mid-winter. He stayed June through . . and he didn't have a degree. He went off to college and came back to NSF and he's been working ever since. So, I taught him, everything he knows.

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IP: Well, I'm sure I would recognize him, but I didn't get to talk to him.

BS: *Yeah, scruffy beard and . . .*

IP: Yeah, well they all have that. The polar explorer look.

BS: *Well, Dave is back at NSF.*

IP: Dennis Peacock at NSF was down there when I was. He was doing ionospheric research at that time. I had a 2-1/2 year tour as a division director at NSF, not in Polar Programs.

BS: *Oh, so you know NSF.*

IP: And I, oh yeah, and I reconnected with Dennis. His wife was Rowena, She was doing an administrative job for a different directorate. Oh, yeah.

BS: *So, he's a friend. You could have probably arranged a tour of South Pole while you were at NSF.*

IP: I could have. They always have somebody from another NSF Division, but they winter-over. I don't want to do that.

BS: *No, no. Oh, God Almighty, I can't believe how many people came down there from NSF, the Navy, from Congress.*

IP: I would have done it if it had been possible, but it wasn't.

BS: *They had accountants down there to look over our accounting. I had a comptroller and I was the accountant.*

IP: Oh, I wanted to, but . . .

BS: *I spent most of the money - 90% of the budget was me, NSF's budget. So, OK. So you did that and you got on the Polar Research Board. When was that?*

IP: that was a few years later. It was . ..

BS: *Who was the head then, the head of the Polar Research Board? It doesn't matter.*

IP: I could give it to you when I . . .

BS: *Slip it in when we . . .*

IP: Dave Clark. . . they had a heavy contingent of Arctic scientists by then. NSF and the OPP had quite a focus on trying to get the Arctic research program up and running.

BS: *They're doing good. They're starting to roll into the area. ONR dominated it for so long, but now the Cold War's over.*

IP: NSF was under a lot of pressure to get it up and going fast. Congressional, probably, representing Alaska.

BS: *Well, when Peter Wilkness took over Polar Programs, Ted Stephenson and he were buddies and Ted had this edict made that NSF would be the lead agency in the Arctic. The Navy was up to their eyeballs in stuff up there. Still probably spend more - I mean one submarine cruise costs a fortune. Now, they're not taking scientists on the cruises any more. I don't know how that's working out. So, you're on the Polar Research Board.*

IP: Yeah, and I enjoyed that. I was too far away. See, after I went back, I did some more things, but priorities were changing and our station wasn't there any more and money was going downhill for that kind of research and Stanford wasn't so interested in sharing any more. And Stanford was the 800 lb. gorilla on this kind of research. And along about the time, I'm thinking, 'You've got to change fields, Irene, what are you going to do next?' A friend of mine, a colleague in the department, became Dean of Engineering and wanted me to be one of his Associate Deans and that was breaking new ground for women, too, to be an Associate Dean of Engineering. So, I thought . . . and I liked him a lot. I thought working with him would be great, so I did that. And when I went back to the department three years later, I really did change fields, though I never went away from electromagnetic propagation. I started doing sub-surface remote sensing, and I had money from the Army for. It was really related to buried tunnel detection in Korea -

electromagnetic ways of attacking that problem, like GPR modeling and that kind of thing. So, that 's what I did later.

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BS: *You went to the post-graduate school? Naval Post-Graduate School?*

IP: As a visiting professor, that was in '86-'87. And I've been on NRAC. I was invited on to NRAC initially because Admiral Mark Pelaez was the CNR at that time. When he called me up he said we'd be interested in the kind of work that you know about that might be related to submarine detection and etc., but they never did a project like that while I on NRAC. And I enjoyed NRAC. I liked it a lot.

BS: *How about the Arctic Council?*

IP: Yeah. None of that.

BS: *But, you were up in Point Barrow.*

IP: I was.

BS: *And what was your role there?*

IP: I just went up for that big celebration representing the Polar Research Board.

BS: *Oh, you represented the Polar Research Board. You weren't on the council that traveled to Resolute and all that? OK. I misunderstood you. I thought you were on the Arctic Research Council.*

IP: No, it was the Polar Research Board. I represented them, and the reason I was the one to go was that I was willing to pay my own expenses to do it.

BS: *Did you? Did you pay it?*

IP: They finally negotiated with me to pay half. I said, "I just want to go to Barrow, I don't have another reason." And . . .

BS: *NSF had all kinds of . . . they didn't even have a role up there hardly, and they paid for about 25 guys to go up from the Washington, DC area.*

IP: I was out of NSF by then.

BS: *Oh, I mean guys like . . . . they'd been retired for years and years and years from ONR. All those ONR guys went. Who was the head of NSF at the time? He was up there.*

IP: Neil.

BS: *Neil, yeah.*

IP: Yeah, Neil went.

BS: *Yeah, I had dinner with him. So, that was your last trip to the pole? Oh, the tourist trip.*

P: The Elderhostel trip was my last, and Barrow was close enough for the Arctic. I just wanted to go, and so I volunteered to do it. Ultimately, I paid half and PRB paid half. No big deal.

BS: *One year, I did the whole season down in Antarctica. I think we're done, aren't we?*

IP: We probably are, unless you want to see my painting.

BS: *You made a comment that this had an effect on your life that you hadn't thought about before.*

IP: I hadn't thought about it in this way. My department, to give the most benefit of the doubt that I can, I can just say that they had a very hard time with themselves and each other over awarding me full professor status. That was very difficult for them. And they had sort of delayed me a little bit. It happens a lot to women. It still does. And the higher up you get, the greater the resistance is.

BS: *The glass ceiling.*

IP: Yep. You bet. They had a very hard time with that, but I think because of the Antarctic trip, the research that I was doing, the kind of reviews that it got, the number of publications that I got out of it, all those things combining together, they just had to, at a certain point. They just pretty much had to face it and say, "OK, she did it."

BS: *There was some really good stuff coming out of your Antarctic research. And follow-on research that built upon yours.*

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IP: Yes, of course, so I got to be a full professor in 1971 and I got to be a Fellow of the IEEE only two years later, based really on the record I had accumulated by 1971. Normally, there's a longer lag between the two events. Either I was precocious in the academic sense, or else the delay in achieving full prof status was longer than it needed to be. Take your choice.

BS: *So, I think it's important that we talked about briefly, and I'd like to reemphasize and close this out that from what I know and it all comes together in a web of truth at these interviews - a lot is forgotten, but it kind of is like a bunch of screens. If you get enough screens, it will keep out the flies. But, I think what I perceive here is that the group from Ohio State that went down really didn't integrate. That they were put off in a corner by themselves.*

IP: But, they broke through. They broke through.

BS: *They broke through first. There's no question about that. Actually, there were two stewardesses went down in 1957. I know where they are and want to interview them.*

IP: Really.

BS: *And I know where they are. Of course, Jackie Ronne and Jenny Darlington on the Finn Ronne expedition were there. They're both alive and well. Just had a reunion in fact.*

But, you, as far as scientists go, for working and breaking into that man's world was the one that did it.

IP: It made it impossible for people to say that a woman can't do the job there.

BS: *That's a better way of phrasing it. OK. Let's close it at that. It was a good interview.*

(End of Tape 2 - Side A)

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End of Interview