

Oral History with John Pearse, Jack Littlepage, and Paul Dayton. 4 February 2012

PETER: It's February 4th, 2012, and I'm Peter Brueggeman at the Scripps Institution of Oceanography Archives. Please introduce yourself by name and affiliation for voice identification.

JOHN: I'm John Pearse and I'm with the University of California Santa Cruz, retired.

JACK: I'm Jack Littlepage with the University of Victoria in Victoria B.C., retired.

PAUL: I'm Paul Dayton, I'm at Scripps and I'm retired.

VICKI: I'm Vicki Pearse and I'm married to John. University of California Santa Cruz and Stanford University, and I didn't get to retire.

PAUL: Maybe each of you could just talk about how you got involved in the very beginning, before you went to high school, and, college. I know something about John, because he was in Tucson like me, but I know nothing about you, Jack.

JACK: Maybe a good way to start is to say how old we are because that gives a time line. I'm 77 and I went to Chula Vista High School, just south of San Diego. I was well on my way to being a juvenile delinquent until I got tangled up with the museum. I was terribly bored in high school and I got involved with the San Diego Museum of Natural History, which opened thousands of doors for me. I worked there from my junior year in high school, through my senior year in undergraduate work. I did my undergraduate studies at San Diego State, and worked on weekends out at Scripps, generally with Carl Hubbs or earlier than that I worked with Ken Norris and Connie Limbaugh, doing diving trips for Carl Hubbs, collecting fish off of Scammon Lagoon, Cedros Island and other locations. Then I went to Stanford; that would have been 1958. I met John Dearborn there, and I think you came the next year, didn't you, John?

JOHN: Actually I came in 1958, you must have come in '57 or '56.

JACK: No, I graduated from San Diego State in 1957 so it would have been the fall of 1957 when I came to Stanford. My major professor was Donald Abbott. After the first year at Stanford I went down to Hopkins Marine Station in the summer of 1958.

JOHN: I went down first time in 1959. I went down and lived on Granite Street with Bill Austin and his wife, Diane, and George Cooper, Michael Soule, and George Araki. We all lived together that summer.

JACK: John Dearborn and I did a lot of collecting for Don Abbott for the courses we were taking the summer of 1958. And, then, we went back to campus. John went down to the ice at that time, and I didn't know Curly at that time.

PETER: Curly is Donald Wohlschlag, who ran the Antarctic program for Stanford.

JACK: John Dearborn went down. And he came back, after his, oh, ... let me get this square. I knew John before he went down and he told me about the Antarctic and what he was doing. So I was familiar with the program that he was going to be doing in the Antarctic, and I must have met Curly, Donald Wohlschlag at that time. John Dearborn went down and then I approached Curly to see if I could go down, because I had not really found a good project that I liked in Don Abbott's area, and going to the Antarctic appealed to me. We also got paid for it... rather well, and that was an incentive, because I was like all graduate students, stone broke and looking for money. So I made the approach to Wohlschlag, that I go down as John's field assistant to see what it was like down there, and see if I could do any research down there. So that was how I got involved with the program. Definitely, I went to Wohlschlag and asked if I could go down and help John Dearborn with his work.

JOHN: That would be the end of 1959, right? Fall of '59.

JACK: Yes. Because, January 1959 John Dearborn went to the ice. And August, I went to a USARP orientation in Virginia.

PAUL: U.S. Antarctic Research Program.

JACK: Yes, the very first orientation session that they had in Smoky Mountains, ... Skyline and Smoky Mountains. They issued us clothing and everything, this is before the God awful USARP jackets which were totally useless. We got some very nice military clothing to wear, it was heavy but it was very functional. Then in October, I took a MATS [Military Air Transport Service] flight from Travis Air Force base down to Christchurch and then stayed in Christchurch and then Super Connie [Lockheed Super Constellation aircraft] down to the ice and I arrived on the ice, mid-October, in 1959. John Dearborn was there, and he was there all alone, trying to do his work. It was extremely difficult. How John Dearborn managed to do what he did, it was just unbelievable.

PAUL: You guys might give a hint, what John Dearborn really had to do. I always wondered what happened to poor John. He must have got off a boat or plane and there it was, just ice, and he was supposed to do benthic ecology under the ice.

JACK: That's right. John Dearborn built the first ice house. He built it out of just packing crates. There was no insulation, no electricity, nothing,

JOHN: Just a box to keep him out of the wind.

JACK: Most of his work was just out in the open, through an ice hole. As far as equipment goes, as I remember, he had an ice chisel, which was a long piece of steel with a sharp point on it.

JOHN: How did he make holes?

JACK: He used seal holes and he blasted. Mostly seal holes, I think. He did some blasting. He had no winches; he had rope, wire to make nets and traps.

JOHN: He had the hand winch.

PAUL: That came later.

PAUL: You guys are in a lot of those pictures, that may have come later. That would have been a little tiny thing:

JACK: Transport was by a weasel [tracked vehicle] when it ran. He had nothing... just amazing what he managed to do.

PAUL: Do you know anything about how he was asking his questions, how he decided what to try to do?

JACK: I was not privy to that. Because we didn't know, the questions like, when I went down which was a year later, is there any plankton there? Is it going to be there in the winter? We had the scientific reports from the Scott Expedition, and that was all the information that we had. We knew it was there in the summer, but that was it. So the questions you asked were very simple.

PAUL: I've looked at the old Scott / Shackleton expedition scientific reports, and they collected things and they told you how to do it, but they didn't tell you where things were.

JOHN: No.

PAUL: So John Dearborn wouldn't have known anything.

JOHN: I think John Dearborn was just going down there to see what was there, what could he find? It was almost all by bottom grabs and traps.

JACK: Yes, he did a lot of trapping. The bait for the traps was seal meat; at that time there was a large dog pup colony down there that the Navy maintained.

PAUL: The Navy had dogs too?

JACK: Oh, yeah, they had dogs. They would go out and kill seals for dog food, and John Dearborn would go along and collect parasites, and stomach contents and bait for the traps. That's where we got the traps and that's where he got a lot of data for publication on food habits and traps from the Weddell seals and seal kills for the dogs. When I got there, I had no idea what I was doing. I was just on a lark to Antarctic to find out what it's like and help John. I introduced some things we were talking about to John, who was very good scientist but not very innovative in craftsmanship and those sort of things. He had nothing like a tripod,... he just pulled ropes out of the ice holes by hand and I said, this is not going to work. We built tripods and attached the rope to the weasel, and that made life much easier. So we didn't have to --

JOHN: He must have loved your help, because he had spent a whole winter doing that.

JACK: I know, it was terrible. I did it for about a week and I said, John, I can't do this. So he had nothing, he really did. The lab was not built at all, and he did, all of his work that first year in a Jamesway [hut]. By the time I got down there, in October of 1959, they had the lab buildings,... I think they were T-5 buildings or T-3 buildings. There was one built, and most of the equipment was buried in the snow outside. It had not been moved inside at all. And then there was no plumbing. Very primitive heating in there. I don't know if John actually ever worked in the T-3 that year; the next year he did. That first year, at best, his conditions were no better than Scott's, maybe worse.

PAUL: Probably worse. Yes.

JACK: Scott had pretty good conditions.

JOHN: Scott had working space on his ship, and then in his huts at Cape Evans.

JACK: When we were in his huts and things, we were amazed. They lived in relative comfort.

JOHN: But they didn't have much of a lab.

JACK: No.

JOHN: I think those guys going out there and collecting were doing about the same thing John was doing.

PAUL: I think so too. I mean, the pictures are the same. Their explanation and publications talk about not letting the rope freeze,... laying it out so you could walk it out and put it down the hole. Those were things that we all enjoyed too.

JOHN: The one thing which I don't think John ever did, was try to do dredging by taking the rope down a hole and hooking it from another hole like I think Scott's people managed to do.

PAUL: They used the crack in front of Hut Point, and there's always that tight crack there and they kept it open.

JOHN: So they could run the whole thing down through the crack?

PAUL: But they had a rope down there the whole time. So they were dredging that area right in front of Hut Point. That's the only place they dredged.

JOHN: Yes, I used to think about, how could you dredge? This would be interesting to do, because all we could do was just drop gear down a hole and grab stuff.

JACK: We did dredge at Cape Evans when the ice was broken, but not before.

JACK: John Pearse and I were talking earlier, and we think there were only two USARP people wintering over in 1958-59. They were the only PIGY people, post-IGY [International Geophysical Year, 1957-1958] -- Matt Pryor (?) and John Dearborn. I can't remember anybody else there. Looking at my notes, in January 1960, Will Tressler came down; he was the oceanographer that preceded me. He came down with a huge amount of equipment.

PAUL: Was he Navy?

JACK: Yes. U.S. Hydrographic Office.

JOHN: He came down with an assistant and a big house to build on the ice over his station.

JACK: His own T-3.

PAUL: That's the one that went out to sea.

JOHN: That's right. It went out to sea as the ice broke up in March 1961.

JACK: ... and a polecat [all-terrain vehicle] came out with him.

PAUL: My old polecat. That was Tressler's?

JACK: Yes, it was brand new when they came down. That must have been in January 1960. As near as I can tell, that was when we set up the Cape Evans trail, because Jack Long was a traverse engineer. That was the person who drove the snowcat and we towed it up with a trans-Antarctic snowcat.

JOHN: Where did the trailer come from, Curly got it?

JACK: Yes, so it had to be there. It came in by ship. We had to take it up on ice, so it couldn't have been too late in the season. It had to be early January that we took it up.

PAUL: Because the ice used to get rotten about then. So you guys got the trailer down there

JACK: John and I took the trailer. We were there when they took the trailer. Jack Long took it up, and I think some of the Seabees [US Navy] came up and put it on the skids and tied it down and all that stuff. Then John and I went up later that same year and stayed there for, I think probably a month. It was quite awhile, a long time we stayed there. That was when we dug a snow cave for a refrigerator, so it was stocked well with food from McMurdo. We had taken over what we thought was the radio shack from Scott's expedition. It was a little tiny four by four, four by six, and we had what they called an angry nine radio, which on good days could reach McMurdo.

JOHN: Could you get into Scott's hut?

JACK: Yes. We got in and it was just like "Doctor Zhivago" with ice crystals and everything. We must have been early ones in there because nothing was touched. Nothing was touched, and the pictures they show now, with everything on the wall, and they say this is like he left it. Forget it. You know, it was jumbled and ice.

PAUL: I've now read a lot about Shackleton's expedition and they're making do there and they left in a hurry, with food on the table. Did you see the meal on the table? When Shackleton came down to rescue the McMurdo party, most were living at Cape Evans, Ernest Joyce and Frank Wild had escaped and gone up to Cape Royds because they didn't get along with the others. Shackleton stayed for several days looking for the bodies of Mackintosh and Heyward. He made a huge effort to clean up the hut, because it was Scott's hut and everybody was mad at him for using it. So he made an effort to clean up the hut.

JACK: We were amongst the first in there. It could have been there because we didn't touch anything inside.

PAUL: Well, the Kiwis in 1961 and '63, cleaned that up and they still hated Shackleton with a passion in the 1960s. They erased those guys, and they put that building carefully back into the picture from Scott's mid-winter party. You guys were there before this happened and I would dearly love to see your pictures of the Cape Evans Hut! Now it's even different.

JOHN: You probably saw it before the Kiwis got back.

PAUL: That's right.

JACK: I remember sleeping bags on the cots.

PAUL: That's right. You didn't see that, but that's the pictures that you've seen, of the hut, and what you saw probably, even by when you got there.

JOHN: Right, 1961, I can't remember too much about it. It was dark and filled with snow and ice. The next time I went up there it was there the 1980s and it was all cleaned up.

JACK: I remember it was dark and there was a big radiator in the center, some sort of a cold fire oven.

JOHN: Oven in the center or stove.

JACK: But the sides were all ice, just covered with ice and you couldn't see very much. I know that unfortunately, I took one or two little cans of provisions, as souvenirs.

JOHN: Was the dog there?

JACK: There were dogs all over.

JOHN: There was that dog on a chain when we got there in late 1960 or early 1961.

JACK: That was at Evans. We had a dog at the lab too, that stood by the door, frozen solid until the admiral had a fit about it and made us take it down.

PAUL: I've read the history of Shackleton and then seen those guys erasing him, and that was going on when I was there.

JACK: Well, there were lots of parts of the tractors and everything scattered all over, fuel cans, all of those things were all around. There were some dead animals, dogs there, we didn't go in that much. We didn't really have that much time and it was difficult to get in. You couldn't go very far.

JOHN: It's also something that we respected.

JACK: That was, God lived there.

PAUL: Yes, yes, for me, too. So, now we got you and Dearborn, in this little trailer, for a month,

JACK: That's when we ate the penguin.

PAUL: That's when John Dearborn was taking his airplane gas tank out?

JACK: Yes, it wasn't a gas tank. It must have been a navigation port or something, off of something like a DC3. It was angular, and six feet long, something like that. We tied it, had a rope on one end and John went paddling out into the bay at Cape Evans, that was before he was out on the life raft. I think it was the thing, when you look through the sky, when they're navigating, they have sort of a triangle thing on top. I think that's what it was. We got out there.

PAUL: So he used that make-shift boat; tell us what he did with it.

JACK: He went out and he was having to use an orange peel grab. He would put a dredge down and we'd pull it up to the beach. General collecting, we put traps out. He made one and didn't go far offshore. Maybe 30 feet out or something. We had a short rope, and he wouldn't go out without a rope on the boat.

JOHN: It was open water.

PAUL: So you got picked up with a helo.

JACK: We drove up several times by weasel or snowcat, but on this trip, by helo. Chopper came in. And can't remember, John must have taken all the collections back, but we had all the collecting materials you would want at that time. Then materials started coming in, so we had alcohol and formalin and all the bottles and everything to collect. I remember working in the lab, and we thought it was quite comfortable, until we tried to drink some water, and found the water was frozen solid, but, we had been down there for a while, and freezing temperatures were sort of normal. Those were good days in Cape Evans, I did the cooking, as I seem to have done all my life. Worked hard. There was no spare time, I can tell you that, when we were there.

PAUL: Let me just go back just for my own curiosity. You said that you went from Christchurch, and did you stay on the base in Christchurch?

JACK: No, we were very fortunate. We stayed in one of the main streets along the River Avon. And we were in a commandeered Salvation Army type of

thing. At one time, it was a dormitory for unwed mothers that somehow USARP had gotten ahold of it and that's where we lived. In the time when it wasn't being used by USARP, it was advertised as a bed and breakfast with central heating. The central heating was one little tiny fan in the middle of a huge room and the ceilings were about 20 feet tall. The only restriction we had was that we had to be within 24 hours of the airport in Christchurch Harwood. Other than that, we could do anything we wanted. I traveled all over New Zealand and phoned in every day. I guess I had about two weeks of free travel. I paid for it.

PAUL: Was Margaret Lanyon there then?

JACK: No. It was Goodall.

PAUL: Eddie Goodall?

JACK: Yes.

PAUL: He was there when I went, too.

JACK: They were very good, you know, very good.

JOHN: Very good.

JACK: Check in each day and we'll let you know when to get to the airport.

PAUL: You were waiting for weather?

JACK: Weather.

PAUL: Then you said you flew a Connie [Lockheed Constellation aircraft]?

JACK: Flew in on a Connie.

PAUL: Do you remember a Connie crashing in that area?

JOHN: It was the next year, in October 1960.

PAUL: They must have had three Connies then because they had two that worked through the '60s that I rode on, both of them. This must have been a third Connie.

JACK: There's a picture in one of the Operation Deep Freeze yearbooks. It was the flight before us in October 1960, that crashed. No one was killed. It sort of split in half on landing.

JOHN: But that was the second year.

JACK: That was the second year.

JOHN: When we were waiting in Christchurch some of the survivors came back to the hotel and talked about coming in to land and watching the fuselage separate in front of them, and looking down at the snow being stirred up.

JACK: Back to the previous year, in late 1959, Stoner Haven came in to McMurdo, and his job was to set up the lab. I think by the time we left in January 1960, they probably had the other section in, I'm sure they had the other section of T-3 built and they may have had the connection between the two, the plywood connection. They didn't have the plumbing and stuff in at that time, because they were still doing that when you came down, the snow melter and things like that. I think they just had the two sections.

PAUL: So you and John went out on a ship that year?

JACK: No. I flew out.

JOHN: Yes, we went out on a ship the next year, in January 1962.

JACK: I flew out on a C-130. I remember because they had a bet on who could get through Christchurch the fastest. Was it a C-130 or a Connie? I was fortunate to fly in an observer cockpit of the C-130 when we flew, because I liked airplanes. We flew high so we could go faster. We were trying for time, and the pilot just went zoom and then we went straight down to land. I'll never forget that flight.

PAUL: And you won.

JACK: We won.

PAUL: By quite a bit.

JACK: Yes.

PAUL: So, you didn't think about doing oceanography in your first year, you were just helping John Dearborn?

JACK: I was looking to see what could be done.

PAUL: And Ollie Omundsen? and Tressler were doing oceanography?

JACK: They just got there in the fall of 1959.

PAUL: So you sort of knew when you came back what you were going to do, and more or less what those guys had seen?

JACK: I didn't know what Tressler was going to be doing at all. I'm surprised that I actually did so much physical oceanography. I must not have realized what Tressler was going to be doing because I had a physical oceanography program as part of my thesis, which turned out to be probably one of the most important parts of it.

JOHN: Yes, quite frankly.

JACK: Tressler's data, considering the resources he had, was very skimpy.

JOHN: Your paper is the one that is a benchmark paper, not Tressler's.

PAUL: There was a Kiwi program, too, but it had some current meters of some sort.

JOHN: That was down at Scott Base, just off Scott base, that was trying to determine whether the water was going in under the Ross Ice Shelf or out from it, right?.

JACK: That was early. I think that was very early. But when I returned in October 1960 to do my thesis work, it was decided that I would be doing physical oceanography in support of my plankton project. So I must not have known exactly what Tressler was going to be doing at that time [in 1959-60]. When I left the first time, in January 1960, I had made up my mind that I would be doing a plankton project. The physical part of it... the questions, were not esoteric. It was "are we going to find plankton in there?" I remember, writing up my thesis proposal, one of the questions, is there plankton underneath the ice year-round?

PAUL: Pretty good question.

JACK: It is a good question, and in retrospect there are lots of things I should have done, should have had more money, spent more. All of us had that feeling. But, by the time I left, in January of 1960, I had not only helped John Dearborn with his work, as a field assistant and I had defined what my project would be. Then when I went back to Stanford, the northern summer was spent just getting materials ready for the next trip down, in which I knew I would be spending a year and a bit down there. I planned to winter over.

PAUL: I was always wondering how you got into the plankton, in the physical sense, physical oceanography.

JACK: Sort of by accident.

PAUL: Well, but you were there, and you were asking those questions and you were interested in plankton.

JACK: Yes, and we had no information on temperature.

PAUL: You were an Abbott student, not a Curly student.

JACK: Officially an Abbott student but in effect, a Curly student.

JOHN: Neither of them knew anything about plankton,

JOHN: Although Abbott was doing the CalCOFI stuff.

JACK: In addition to that I did plant nutrient work and light, and I think probably in the design, the physical oceanography, temperature, salinity was ancillary. I needed the data and it became a big thing. We're getting into the next year now, but when I left the first time, in January 1959, that was my intention, just to do plankton.

PAUL: Should we shift to John Pearse, because you've covered a whole area that I didn't know.

JOHN: So you covered the 1959-1960 summer, and now we are going to the 1960-1962 year. I'm 75 and my background is, I went to high school in Tucson, Arizona. Like Jack Littlepage, one of the defining things for me was working my last two years in high school at the Arizona Sonora Desert Museum, where I built trails and exhibits, collected specimens for the exhibits (mainly snakes and lizards), and cared for them.

Because my father was working for the U.S. Aid program in Egypt, after high school I went to Egypt for one year, and attended the American University in Cairo. Living in Egypt was an eye opener for a kid from Tucson, both the culture there, and the desert environment, especially along the Mediterranean and Red Sea coasts, where I got my first taste of marine biology. There was no biology program at the American University in Cairo, and I wanted to be a biologist. So after my freshman year I went to the University of Chicago. My father had graduated from the University of Chicago, and he could get me a scholarship there. He told me that he would never ever recommend that anybody go to live in Chicago, where he grew up, but then he said, his brother lived there and I could live with him and we could get a scholarship for me, so being an obedient son, I went to Chicago. I wanted to be a biologist, primarily a desert biologist, but living in Chicago, the main thing I wanted to do was get out of Chicago. I liked the University, it was a very good school and the classes were challenging., However, at that time the faculty did not encourage their better students to leave if they were going on to graduate school, saying there's no school as good as Chicago. I must have been a good student because they let me know I should stay there for graduate work

(besides, most students were pre-med, so there were not many of us majoring in zoology, three in fact). I had become fascinated with marine invertebrates in my classes. When I realized they did little work in marine biology at Chicago, I said that is what I wanted to do graduate work in, and they allowed that I might want to go to a university of the coast, such as Stanford.

JACK: It's interesting that both John and I started out as probable herpetologists, both working in the desert. Very similar, both at museums, very similar background.

JOHN: Just like Paul, who also was raised in Tucson.

JACK: Then we banged together over invertebrates.

JOHN: That's right. Then in the fall of 1958, after spending a wonderful summer at the Marine Biological Laboratory in Woods Hole, Massachusetts, I came to Stanford with no professor in mind, nothing in mind in fact, except that I wanted to work in marine something. My first choice was actually going to Hawaii, but Stanford gave me a better offer. When I got to Stanford I was assigned to be Don Abbott's student. In the spring of the first year, I took a seminar run by Arthur Giese on reproduction of marine invertebrates. He had just written a big review on the topic. It was kind of a boring seminar, with students droning on, but the topic was very interesting and it caught my attention. I told Don I was interested in looking into invertebrate reproduction, particularly reproductive cycles of marine invertebrates. Don said I should sign up with Giese, particularly because he already had too many students, so I switched and my major professor became Arthur Giese. Don remained on my committee, and was always very supportive and helpful. At the end of the seminar, I heard about the idea that temperature controlled the timing of reproduction of all marine invertebrates in general, so species that spawned in spring and summer responded to increasing temperatures, while those that spawned in the winter responded to decreasing temperatures. This idea was known as Orton's rule after an Englishman who first formulated it. A corollary was that if a species was in a place where the temperature was constant throughout the year, reproduction should be constant throughout the year. Therefore, in the Antarctic and Arctic, as well as the deep sea and the tropics, where temperature is constant throughout the year, reproduction should be constant throughout the year. That seemed improbable to me, particularly in polar regions where everything else is very seasonal.

PAUL: You knew that?

JOHN: You thought you knew that.

PAUL: Yes.

JOHN: But that paradigm had already been pretty well established. MacGinitie had gone to Point Barrow, Alaska to look at reproduction in animals there. He said most things did reproduce throughout the year, although he found exceptions. When I heard about the Antarctic program from Jack and John after they returned in early 1960 and talked about it, I thought I might be able to look at the problem there. Jack and I were living together in 1960 on College Avenue in Palo Alto with several other people. I was told that Curly was looking for people to go to McMurdo that fall. I went to see Curly sometime in early 1960 and said I'd like to go down. Next thing I knew I was on my way to McMurdo. It was very fast. It was one of those kind of decisions I didn't really make. I just inquired and bingo the decision was made.

PAUL: So you went up from Hopkins?

JOHN: No, I was at Stanford in Palo Alto during my first two academic years there. I got there in the fall of 1958, took classes, including Giese's seminar in spring 1959. That summer, 1959, was my first summer at Hopkins Marine Station, when I took Don's invertebrate class, then I returned to Palo Alto, for the 1959-60 academic year.

JACK: John Dearborn and I were at Hopkins at the same time, in the summer of 1958. That was the only summer I spent in Hopkins. John Dearborn went to McMurdo that fall, and I joined him in the fall of 1959. We returned to Stanford in early 1960.

JOHN: I met John Dearborn in 1960, after the two of you returned from that first time at McMurdo. You and I must have known each other my first year at Stanford, 1958-59, I don't remember, but John was at McMurdo then.

PAUL: And you went to talk to Curly.

JOHN: I talked to Curly.

PAUL: And he was gearing up for the Antarctic field season at that point.

JOHN: At that point. That would be the winter-spring of 1960. The summer of 1960 I went back to Hopkins and was the T. A. for Otto Kinne's ecological physiology course. That fall we went to McMurdo.

JACK: Well, we didn't get down there until October.

JOHN: That's right.

JACK: I spent most of 1960 building ice houses and things of that nature, at the shack at Stanford.

PAUL: You said that was at the net loft?

JACK: Yes. The net loft was a series of buildings, somewhat, at that time, off campus. It was a lot of space to do the sorts of things we needed to do to construct the ice houses. This was all done by contract. Curly had contracted some people to build the houses and we just told them what we wanted and they built the houses. We also built or had contracted to build winches and things to use, to do the collecting.

PAUL: Was F. J. Thomas on the scene at that time?

JACK: No.

PAUL: So Curly himself was contracting the people to do the work

JACK: The net loft went back to the Te Vega expeditions and it had oceanographic gear and the offices were in one complex.

VICKI: Te Vega started in 1963.

PAUL: That may have been CalCOFI then. There were fish collections galore. There were tropical fish and there was a professional artist.

JACK: He had two buildings and fell out of favor, for a number of reasons and left Stanford.

PAUL: So it was a big work area.

JACK: Big garage.

JOHN: It was way out in the boonies from Stanford.

JACK: Beautiful parking, just drove up and parked.

JOHN: By the end of the summer of 1960, I was all set to go, and my plan was just to go down and find some animal that I could work with for a year to find out whether it had seasonal reproduction. It wasn't anything much more focused than that. I also was all geared up to do a lot of biochemical work, lipids, proteins, and carbohydrates, and how they related to seasonal cycles, because Giese's lab did a lot of that kind of work. I flew, out of Travis Air Force base. I was engaged at that time, and my fiancée took me to Travis. I flew away to Christchurch, New Zealand, and met Jack there.

PAUL: Did you have to stop for fuel?

JOHN: I'm sure we did, probably stopped in Fiji.

PAUL: When I went on the Connie, we stopped several times.

JOHN: I think Fiji was the main stop, on the planes going both down and back, but we also might have stopped in Hawaii. So, we flew down, got to Christchurch, had the same thing Jack had the time before. It was very stormy at McMurdo, so we couldn't go down. We went all over New Zealand with a rented car. We went to the west side of New Zealand, got to the North Island, Rotorua, about as far away as we can get and still think we could get back in 24 hours when we got the call saying we needed to be back in Christchurch within 24 hours. We had to run all over the place and had to get another plane to get back. They were concerned that we were a little too far away to get back in time.

PAUL: At that point you were in North Island.

JOHN: We were up in Rotorua, nearly the center of the North Island. As I recall, we had to get a special flight to Auckland, and then fly to Christchurch. But we made it.

PAUL: And it was the two of you, and John Dearborn wasn't there.

JOHN: That's right.

JACK: John Dearborn came later.

PAUL: So then the two of you got on a Connie?

JOHN: We got on the Connie and flew down. And when I got down there, I didn't know anything. It was all new to me, but Jack had been there before, so I just followed Jack around and did what he told me to do. First thing we did was put in some houses, and we blasted holes and that was one hell of a lot of work.

JACK: Not too effective.

JOHN: Not very effective. The mound of brash ice that came up after the blast took you two days to shovel out, and then you had a hole you couldn't use well anyway. Then we got into chain saws, which I thought was really the way to go. When I went back in the 1980s, I tried to show people how to use the chain saw, and they were all drilling holes with huge circular drills. They thought I was crazy, and I had to agree; cutting holes with a chain saw is a lot of work.

JACK: I have pictures of John cutting a big hole, in your station, we could barely see John sticking his head out of the ice.

PAUL: So this is your first year.

JOHN: We blasted at the beginning, and then used a chain saw.

PAUL: It's technically interesting, because, to blast a hole, you've got to actually have the dynamite down a drill hole.

JOHN: No, we had shaped charges.

JACK: I was the chief blasting officer.

PAUL: And you made a big cavity.

JOHN: That's what the problem was, the edge was uneven and difficult to work around.

PAUL: And maybe a tiny hole at the bottom.

JOHN: There was plenty of a hole, but it froze up.

JACK: What happened was frazzle ice came up by the tons.

JOHN: Frazzle ice, it's all the soft ice on the undersurface of the sea ice, which came up and filled the hole and all the broken ice that fell back in the hole after the blast; digging that stuff out seemed never ending. We have some great pictures you standing in the middle of that stuff, Jack.

JACK: That was terrible. Also the shaped charges produced a huge black spot. Then, the holes started to melt around the outside, and it was just unsatisfactory. We'd talk about, blast supervision and stuff. I grew up part time on a farm, and we used to blast stumps and rocks and things, so I had some vague idea of how to use explosives. I was the explosive guy, and I just walked over to the Navy's supply store, and I said I want to blow a hole in the ice. They gave me packages of C3 explosives and fuses and all of the things one needs, and we went out and had a great time blasting holes in the ice.

JOHN: We were lucky, the metal stands holding the charges would fly by your head. That was pretty close. So we got the holes in, and we built little houses using plywood and beams in the Navy supply yard.

JACK: Temporary houses.

JOHN: We had pre-fabricated houses for wintering over, but we didn't want to put those out because the ice would go out later in the summer.

JACK: I don't think they were there.

JOHN: That's right. We had the ships coming down with them, so we built these little plywood houses. It was just two, or did we build one for John [Dearborn] too? I can't remember. I don't think so. I think --

JACK: Two was maximum.

JOHN: Yours and mine, and then John came down, he didn't come down until December or so. John, that first year when he was down there, he thought that was his year, and he came back to Stanford and talked to Don Abbott and said, this is what I have. I found these things down there, and Don says you don't have a thesis. John was getting ready to get married and got married, and then told his bride, well, I have to go for another year.

PAUL: Did he really think he had a thesis?

JOHN: I have no idea. But anyway, he didn't, at least Don wasn't going to take it. So John came back down, and he came down as late as he could, I think. He went out as early as he could, on the other end, and he let everybody know that he was not happy to be there for a second year.

JACK: The second winter was hard on John. It was really hard on him.

JOHN: He didn't like it at all. But he did do biology then and he worked really hard collecting.

JACK: He was an obsessive note taker. He taped everything, absolutely everything was recorded. His journals would cover absolutely everything in detail.

PAUL: He was always very stoic, talking anyway.

JOHN: He was not a happy camper that year.

JACK: It was interesting that both John and I had gotten married. I went down for the 1959 season, and then went back for the winter. So I was recently married, and John had just gotten married soon after we returned from his first year.

JOHN: I was supposed to be getting married. We had these weekly, or were they weekly or less than that, phone calls,

JACK: From the ham shack.

JOHN: And all of a sudden, my fiancée was never there to take my call, couldn't get an answer out of her. I would call and there would be nobody answering. Finally I called George Cooper, and he let me know that, oh, she's gotten married.

JACK: I remember that day. Not too thrilled about it.

JOHN: Not only she got married, she had been knocked up by Stoner Haven who we saw in Christchurch on his way out of McMurdo.

JACK: We had a tape recorder in the lab doing some musicals and it was about somebody, just like your situation, and so we used to always turn the tape off when you were there -- it was, too close to home.

JOHN: It was one of the luckiest things that ever happened to me, but I did not realize it at the time.

PAUL: Jack, you went down and you were looking for plankton, and you knew you had to do some physical oceanography. I'm quite interested in why you did such a terrific job of physical oceanography. I don't know how you, John, picked the most important species there.

JOHN: It was the most common thing there. We put the traps down and got three things actually. Lots of little stars in the shallow site. And in the deeper one, where, Jack was, 270 meters.

JACK: 283, I think it was the number.

JOHN: What we got in both of them were amphipods. So I thought, I would be an amphipod person. I collected amphipods all year long, and the stars too. I had two theses, and the third thing in the traps was a species of *Parborlasia*, a big nemertean.

JACK: I can understand why you didn't work with that.

JOHN: I had to get something that would come into the traps all year. And I was worried and rightly so, that I could start working on some animal, and it would disappear at one part of the year, perhaps it would stop feeding and wouldn't go to the traps, so I wanted to do work on at least two species. So I worked on both amphipods and sea stars, and I think I got more information on the amphipods than I did on the stars. I had two problems with the amphipods. First, they did disappear from the shallow station for part of the year. More seriously, I thought I knew what I was working with, and at the end of the season, in the austral spring of 1961, I bottled some up and sent them to the amphipod person, Des Hurley, in

New Zealand just to make sure I had the species identified correctly. *Orchomenella rossi* had been described, and that is what I thought I had. However, I was told that I had two species in my samples, one was *O. rossi*, but the other more abundant one was undescribed. Hurley gladly described it as a new species, *O. plebs*. However I had not discriminated between them throughout the year.

JACK: This is the last thing you want to hear.

JOHN: Right. So I still have those samples,... they're in my garage, among other things. I can distinguish the species, and I keep on thinking I'm going to write up what I found. Actually it is a good story, and no one has collected data like I have from that year.

PAUL: But you were with Giese, and you were almost predisposed to play with starfish?

JOHN: Well, sort of, yes. But you know, Giese worked on a lot of different things.

PAUL: But you got *Odontaster*.

JOHN: That was not because I thought it was a major species there or anything like that. It was coming into the traps for me to sample. I worried throughout the year about the identification. I thought it was *Odontaster validus*, but I knew that a second species, *O. meridionalis* was supposed to be there and I never saw it. I kept on looking, wondering if it was mixed in my samples because the descriptions of the two species are not very different. Now, of course we've got two other species of *Odontaster*.

PAUL: Those are the only two I know. Are there more?

JOHN: There's five species of *Odontaster* and the two new ones were described last year from molecular data. After they were picked up from molecular data, the folks who separated them saw spines that can be used to maybe tell them apart. They were found on the Antarctic Peninsula, but they could be found anywhere else. They haven't been looked for elsewhere, I don't know. I reviewed a paper recently, by the Brits, who now refuse to call the species they have been working with on the Peninsula *Odontaster validus*; they call it *O. spp.* I said to them, you guys are crazy, you have *validus*, those other species are found in deeper water. They're different colors, you can tell them apart. Slightly different colors, but, one of them is *pearsei* by the way, and the other one is *rosacea*, because it is rosy colored. I could have been screwed on that one, too, because I could have mixed up two species.

PAUL: I don't think you did, honestly.

JOHN: No, I didn't. *O. meridionalis* is a different color, and as you showed, it feeds on sponges and would not be attracted to traps. But, that's why I picked that species. It came into my traps, and then I did a lot of work in the lab. Well, we all did.

JACK: There was some spin off there that was interesting, that I had later decided that I wasn't really a plankton biologist and I was more interested in the sort of things John was doing. Not when I was down there but later on in my career. John was doing lipid analysis for starfish and I thought that was just great, the greatest thing. So I did lipid analysis on copepods, something that I had not intended to do at all. It was one of the most important things that I did down there.

JOHN: That was, yes.

JACK: It was only because we had a lab where we all worked together and I watched John do these things and then, that's kind of neat, you know, and so then I had the copepod *Euchaeta*, which you could see the fat globules in it, and so I started doing that, and that was what they call a serendipitous spin off event that one never plans.

JOHN: I also found that the main species of amphipod I was working on had a huge amount of lipid in it, *Orchomenella plebs* or whatever it's called now [Abyssoorchomene plebs]. All these names are changing like [the white] sponges, but anyway, it didn't have a name when I was working on it.

LATER NOTE BY JOHN PEARSE: I checked my notes and see that the amphipods disappeared from the shallow stations in the spring, as soon as the sun came up. I should have remembered that because I did some experiments in the lab and found that they are strongly attracted to light. Also in the spring they turned green and they were full of diatoms (even those at Jack's deeper station). I figured that the light attracted them to the undersurface of the ice where they grazed on diatoms. I still think that is true.

JOHN: The amphipods disappeared from the shallow water, in the spring, as soon as the sun came up. It spooked me out. You couldn't get them. I could get it all year long from Jack's station so I got data on them for the whole year there. But not in shallow water, they disappeared.

PAUL: Shallow water was how deep?

JOHN: 20, 30 meters.

JACK: Do you think that was bottom ice?

PAUL: That's where your station was, probably it was over that, you said it drifted a little bit by the time it dropped the casing?

JOHN: Yes, anchor ice would be about that deep.

PAUL: He was over my wall [Dayton's Wall, a named underwater feature off Cape Armitage].

JOHN: Was it the winter or summer?

JACK: They disappeared from that station. I think they disappeared from John's station, too, which is about a hundred meters.

PAUL: Where was his station? In deeper water?

JOHN: We put up our two stations in the austral spring of 1960.

JACK: There's the stations we put in at that time.

JOHN: Then those stations went out in March or so. All of them went out. We had open water. We had a terrible couple of months when we could not go out on the ice.

JOHN: This is Dearborn's first station.

JACK: That's mine.

JOHN: No. Yes.

JACK: Yes.

PAUL: Just recording that they're looking at a map [on page four of Jack Littlepage's thesis] and pointing where their stations were.

JACK: That station was Mack Adams probably.

JOHN: When the ice went out this year, 1961, it went all the way out to Pram Point.

JACK: Yes, all of this stuff went out. All of that.

JOHN: Yes, but that was 1959.

JACK: See, that's actually the land.

JOHN: That's the land there. So that's the ice that broke out with John and I after we left Tressler's station in a blizzard.

PAUL: And that's Jack's station farther south there?

JACK: That's the Tressler station.

JOHN: That was a long way out. And that's where John Dearborn and I were when the ice all went out. Tressler had already gone. Did you use it?

JACK: I used it for a while.

JOHN: So that was 60A, your first hut, Jack.

JACK: That was a temporary one.

JOHN: And 60B. We don't have that on here.

JACK: That was mine.

JOHN: That's 61B. 60B was mine.

JACK: That's mine, yes.

PAUL: But it must have been here.

JACK: It was way up in here somewhere.

JOHN: It was almost right there. We put in the first two houses and then they went away when the ice broke out in the fall, and we had to wait for over a month, for the ice to freeze hard enough so that we could get back out there. And it was only about a meter thick, half a meter thick, it was very thin, very easy to work with. So we went out and put up three house. John's and mine and Jack's. We rotated around and helped each other.

JACK: We had a lot of cooperation.

JOHN: A lot of cooperation.

JACK: Another spin off that occurred and this is interesting, that I had to spend a lot of time, in my ice house just looking at the water, because the cables had to come up and down, and you spent a lot of time just sort of staring at the water. We had seals that would come up to breathe in the winter, and I realized that this was the only breathing place for probably kilometers around the place, by the behavior of the seal, how long they had been down, because if they had just went down for shallow dive, they came up and they were quite happy and they

wouldn't breathe very much, and play around and stuff. If they'd been down a long time, they came up and really clearly were out of breath. And so I started timing the things and that's when I came up with the first paper.

PAUL: Diving behavior of Weddell seal. Ecology 1963.

JACK: That got Jerry Kooyman into the seal research. It wasn't particularly correct but it did show that they stayed down a long time.

PAUL: What it showed me, too, was that you guys were thinking a lot and talking to each other constantly and really asking very good questions that hadn't ever been asked before. That's true for all three of your theses.

JOHN: What do you do when you're sitting out there looking in the hole.

JACK: Yes, bored.

PAUL: I mean, but there's lots of things you could do. You could drink, I mean, you guys were unusual.

JACK: We had no drinking problems in our group.

JOHN: No, we didn't.

JACK: We were too busy working.

JOHN: We had a couple of good flings .

JACK: Yeah.

PAUL: My point is that you're being modest, that you guys were unusually good scientists, and at a very early age, to see all that stuff, and ask those questions. The other thing you saw is I presume you saw it while you were looking down the water, the ice crystals drifting by, and in your thesis you recognized the supercooled water.

JOHN: You could see that

JACK: They were attached on the wire.

PAUL: That stuff really helped me [with my research]. But, that didn't happen just de novo. You were looking.

JACK: You could see them.

JOHN: And one of the nice things about cutting holes with the chain saw, you pick up rocks and little *Odontaster* frozen in the sea ice, and you're in over 30

meters of water. You could figure that out quickly that ice must be on the bottom that breaks loose to bring things up to freeze into the undersurface of the sea ice.

PAUL: You figured that out. This is the type of thing I'm saying.

JOHN: And Jack's also. He unfortunately wasn't there when I was out with two other people when a seal came up, absolutely out of breath, and could hardly breathe, and as we were watching it, a *Dissostichus mawsoni* came floating up. So I reached down and grabbed it, pulled it out as the seal was catching his breath and he saw it slide by, and you could almost see it say wait, that's my fish. That was the first *mawsoni* collected outside of the juvenile that was collected during Mawson's expedition and described.

JACK: We had tried fishing. We had big fish hooks. We never caught anything.

JOHN: You got flesh from the seals, we knew the fish were down there. We also knew that Scott's people had seen them. [They even collected one without a head that they found in a hole, but because it did not have a head they ate it rather than save it.]

PAUL: Did the fish, the *mawsoni* fish come up to the hole?

PAUL: The seal caught it, and let it go when it was trying to catch its breath.

JOHN: We realized also, that the fish that were found by Scott's group on the ice shelf had been brought up, about a thousand years ago, and people had all these ideas how the fish got there.

PAUL: Swithinbank and Curley rediscovered them in 1961.

JOHN: They had the idea that the ice was freezing all the way to the bottom.

PAUL: That was Debenham in Scott's team.

JOHN: They found fish there too. But how do you get fish on top of ice like that? Most of them didn't have a head. When they didn't have a head, the seals bit the head off so they could float to the surface and have their meal up there and then they could go back to it, but they would lose track.

JACK: When the seals came up, if they'd been diving a long time, they would, if I had the net in the [hole], they would go right through it. They were desperate.

PAUL: They were coming up.

JOHN: That's right. They were deep divers.

PAUL: It's interesting to recreate that sort of thing, because you're there, you're looking at something that people haven't seen before.

JOHN: One of the most illuminating things to me, and most, I don't know, spiritual, whatever, was spending all that time out there, in my station, waiting for the things to come up and looking down, and it was just a black hole. In October, when the sun came back and there was fresh new ice that had been frozen over the winter, it was just a windowpane and we could look down there, about 22 meters, and see the bottom.

JACK: I remember that when I first saw the bottom.

JOHN: Everything was dark down there, and then you could just lay down there and look at the bottom. You could see all these stars and it was just fantastic. You guys went diving down there, but that was the only time we had any idea what the bottom looked like.

PAUL: Before I dove under the ice there, I spent fifteen months looking down those holes.

JACK: I remember when you came back to the lab and said you could see the bottom. We all went out there and sat around and looked down, John was right, there's the bottom.

JOHN: You couldn't believe it. Of course, then it got darker and darker as the diatoms grew on the undersurface of the sea ice, and in another month, couldn't see anything.

PAUL: When you looked down could you tell what you were seeing? Did you know the anemones that you could see, did you know what they were? Or just white forms?

JOHN: I have drawings in my thesis about what we saw. We saw lots of stars and *Parborlasia*. They were very conspicuous.

PAUL: Because you would have got the nemerteans in your traps. One of my questions was about the group dynamics and apparently the three of you got along, really did.

JOHN: Everybody did.

JACK: Everybody got along.

JOHN: We had this fellow, Bill Fairchild, we called Cosmos, looking at cosmic rays. He was always easy to get along with. Tom Berg was terrific.

JACK: Sully was always good for entertainment.

PAUL: Did you all work out of the Bio Lab [Eklund Biological Center]?

JOHN: Yes.

JACK: Fairchild didn't.

JOHN: He had his own lab.

PAUL: That was the CosRay Lab building.

JACK: It was all electronics and you couldn't see anything.

PAUL: Same lab as when I was there.

JOHN: We used to go over to Scott Base and we got along very well with the Scott Base people too, they were very collaborative.

JACK: Rick [a mechanic or Karl Ricker?] was somewhat on the outside.

JOHN: Yes, he was.

JACK: At that time. One of the things was interesting, when we moved into the T-3, when we went down, they didn't have any bathroom facilities. We built a little urinal in the outer vestibule, coming in from the bio lab because we didn't want to walk way up there, and peeing on the street was frowned upon although it was done quite commonly. We made something that drained into a 55 gallon drum and we put everybody's name, it was a four liter plastic carboy, and everybody wrote their names on the inside of it. And idea was if somebody really pissed you off, you could get even with them. And only one name was totally eradicated by the end of the season and that was Karl Ricker, he got washed completely away.

PAUL: Well, Ricker is the son of a very famous fishery oceanographer and he was into mountain climbing or something and was trying to make a name for himself and was very sensitive about being the son of a famous person. So that may have been part of your problem.

JOHN: I don't think he was sensitive. He let you know his father was well known.

JACK: He was more pro-Canadians at that time, and he spent a lot of time at Scott Base.

JOHN: What was surprising to me when I looked him up recently, he made a big name for himself as a mountain climber and he's one of the big ones in British Columbia. I don't remember him ever trying to climb anything. You would have thought he would have taken on Erebus.

JACK: He used to walk to Scott Base.

PAUL: Did you guys climb Castle Rock?

JACK: No.

JOHN: Castle Rock, we went up to Castle Rock a lot.

PAUL: But did you climb it?

JOHN: I don't remember.

PAUL: Did you walk there or drive?

JOHN: We walked. We walked all over the place.

JACK: Yes. I can't remember climbing Castle Rock.

JOHN: I don't remember either, but I remember it was a place to go.

JACK: We had free rein and we would go off on a Sunday and grab a snowcat and just explore.

JOHN: We could drive up there, too.

PAUL: The changes with the military did happen, and in my mind, when you were there, those guys were volunteers and they wanted to come. The Navy guys.

JOHN: They were with us too.

PAUL: It was not true for me. Many enlisted men were very angry all the time.

JOHN: That they were there?

PAUL: Yes.

JOHN: No. No. All who were there were volunteers. Some of them thought they made a mistake. I don't know that anybody complained too much.

They complained at the end because I think one of the understandings was that they would spend a year in the Antarctic, and then they could go to their choice for their next duty station, and most of them wanted to go and be stationed near their home town as a recruiting officer or something like that. When the orders came through they were assigned to all sorts of places, including the Arctic so, for the next year, you'll be up on the floating iceberg on the Arctic. They didn't like that, and there were a lot of complaints and the commanding officer had to write back to headquarters and say, you're never going to get anybody to volunteer to come down here again.

PAUL: That's interesting, because that doesn't sound like I.G.Y. It sounded like to me, that the I.G.Y.era and Navy guys enjoyed the challenge of building the base.

JACK: We had no problems at all and when they were putting in the snow melter and things, we had some Seabees working, and there was one fellow who was so proud of what he had done, and he used a square and level and thought it was really high tech. He had never done this before, building like this, and they were quite proud of what they did.

JOHN: Yes.

JACK: If you needed some assistance, I can't ever remember them saying no, you can't do something.

JOHN: The one thing about it, is the enlisted people were all petty officers.

PAUL: First class, second class petty officers.

JOHN: That's right. So they were enlisted but they were not just recently enlisted, coming in. They had been in the Navy for a while and they had some status. When they got down there, they were the lowest ranking, so they were the ones who had to go and do some of the shit work, emptying the latrine barrels, and the like. They complained a little bit about that, but what was their choice, there was nobody else below them.

PAUL: You had the admiral spending the summer on the base?

JOHN: I don't remember that.

JACK: He came and went a few times. That was Tyree.

PAUL: Yes.

JOHN: That's right.

JACK: He would come in for a couple of weeks.

PAUL: He didn't have his own house?

JACK: Yes, flag quarters, just down from the USARP building but he didn't stay there long periods of time.

PAUL: Basically, they didn't hassle you at all, like they did us later, and they were supportive, and you go to meals and you go to the bar or something and people were happy.

JACK: Yes.

JACK: We could get anything we wanted. When we went out to the field stations, the mess hall would either pack you lunches and whatever you wanted or we had lots of pre-packaged things we could get to take out.

PAUL: The food has evolved a lot, too. Why don't you talk about what you ate and what they packed for you and if you went out for four or five days, or if you went to, you had a whole arsenal of food when you went to Cape Evans.

JOHN: We went to Cape Evans, that's the only place we spent a lot of time, and we flew a lot.

PAUL: For one day.

JACK: I did at Cape Evans.

JOHN: I know, the year before. I did stay overnight at least once with Jack.

JACK: And White Island --

PAUL: Did you have those little KRats? Canned combat food. I used to stay 12 hours shift in the ice house.

JOHN: We flew all over the dry valleys but we came back for dinner.

PAUL: When you went to the galley and asked, you were going to go to White Island, because you will need some food, did they make you sandwiches or what?

JOHN: No.

JACK: We had little boxes, some sort of a little field box is how I got most of my meals. They had some brown bread and some chili beans or something like that in them. There was some sort of military pack.

PAUL: Is that the K rations?

JACK: I had an oil heater in my ice house, I guess everybody did. So I took the top of it off.

JOHN: And we'd cook on it.

JACK: We could cook right on top of it so I would go get a steak.

PAUL: They just gave you steaks?

JACK: Yes. We had steak, lobster, anything you wanted, in the winter.

PAUL: Oh, that changed.

JACK: We would supplement it if we wanted, or we also had, remember the cocktail area, we used to have happy hour.

JOHN: That's right.

JACK: We'd take one corner of the lab and went to the stores and got some curtains, some sort of blueish curtains and we curtained it all off and we got some cable drums and made cocktail tables out of them. And then we had some access to the USARP con X? with booze in it. We used to make our own booze. It was quite an honor to invite others, some of the officers to come to cocktail hour, and we would go sometimes absolutely smashed to the mess hall. I can't remember if we did it every night or how often.

JOHN: No.

JACK: A couple of times a week, I think.

JOHN: I don't remember too much about that.

PAUL: Did the officers have their bar that year?

JACK: Yes.

JOHN: They had their own bar.

PAUL: It's the same one we had. It's still there. It's now a coffee house.

JOHN: I don't remember. They had a lounge, bar, with a pool table.

PAUL: Same one.

JACK: It was a Jamesway I think.

JOHN: Jamesway?

PAUL: Yes, So they --

JOHN: Officers had theirs, and chiefs had theirs, and enlisted men had theirs.

JACK: And we had ours.

JOHN: We had ours, but we were welcome anywhere, and we would go, depending on how you felt. Well, let's see, if I'm not too -- didn't mind laying back and being bored so I'd go to the officers' club.

PAUL: It's important, because I think it has to do with the volunteering, versus not volunteering to some extent.

JOHN: It might be. The people who I found the most stimulating, intellectually, were the enlisted men. They were curious and would ask us what we were doing and ask to go out with us. We'd take them out and they wanted to know what we were doing.

JACK: The officers in VX Six were also intellectually curious.

JOHN: They were a whole cut above the other officers, as far as just sharp guys. When they went flying, they wanted to know what they were looking at.

PAUL: Now I want to get into some of your boondoggles, because that speaks to the freedom to do them. What made you go to White Island?

JOHN: In the middle of the winter, we were reading Scott's stuff. I read that there were seals out there on White Island. I came to Jack and said, if there's seals out there, they can get out and that means we can get in. So as soon as we got light again we asked to be flown down there and look into the cracks and that's what we did.

PAUL: So you went and asked the pilots?

JACK: Essentially.

PAUL: Hey, guys, you know, we'd like to go to White Island, could you...

JOHN: Could you take us over there. That was an honor.

JACK: I remember that.

JOHN: They took us out there.

JACK: All our traps and everything.

JOHN: They flew away and there was the crack, with the water coming out of it. We started, opening it up, dropping gear through it, and we had stove pipe traps.

JACK: I remember those.

JOHN: We could shove them through the ice and then wait to see what's caught while we wandered around exploring, almost getting lost.

JACK: Did we blast a hole?

JOHN: I don't think so.

JACK: I think we just dropped the traps through the cracks.

PAUL: The cracks didn't go straight down though, it's thick, it's not like six feet thick.

JOHN: They were stove pipes, it's very thick.

PAUL: It's permanent shelf ice.

JOHN: That's where, was it Oliver, who was diving in there. Those guys went and camped there for a year, not Oliver.

PAUL: Kooyman's guys.

JOHN: And Mike Castellini, I think he took his wife.

PAUL: Somebody took a wife.

JOHN: And lived out at White Island and some of them were looking for seals and they went diving, through all that ice.

PAUL: I don't think so. I don't think they went diving.

JOHN: They went diving through that brash ice, I think it was Oliver who did that.

PAUL: It was my team. I had left, and we had worked out a way of dealing with brash ice. We put culverts down through it, and then shoveled the culvert out and so that was the way to get in and out.

JOHN: How thick was the ice?

PAUL: I don't know. The culverts were only about 50 or 60 feet deep. I mean, we bolted them together. They weren't that long, but the ice was way deeper.

JOHN: Still, it was unbelievable. You go down there and then you go down through kind of a wall of brash ice.

PAUL: I've got some photographs of it. What's really scary is that the brash ice went way lower than the culvert and it floats and it could have come right back up and plugged their exit. But this is in the '70s. You also went to Koettlitz Glacier.

JOHN: Yes, we saw open water there. I don't know how we figured that out.

PAUL: It was just a big crack and you fished there.

JOHN: According to our paper, we went back six or seven times. I just remember the one trip.

JACK: I remember going with the Otter the first time, because I talked to the pilot and I congratulated him on such a nice landing on this ice. It was the first time I ever landed on skis, it gave you lots of confidence.

JOHN: When we got down there, there was one other person with us and we can't agree on who it was, but anyway, the three of us, had a two-man tent.

JACK: You think it was John Bunt.

JOHN: I do.

JACK: It could have been because he was there, in the January-February of the last year we were there. So it could have been John.

JOHN: It could have been John because we were there in October, the first time.

JACK: Early. I remember John arrived and I took him out to our ice house and stuff like that. And scared both he and I to death by almost going into the ice.

JOHN: Well, I wish I could remember who it was. I remember there were three of us in there and the snow storm came up and we were stuck for a lot longer than we thought we were going to be. It was almost a day of being in that little tent and you open up and look out and it was totally white.

PAUL: Did you guys go all over the dry valleys. Was that with somebody or did you just go talk to a pilot and say --

JOHN: I think the pilots were more than glad to take us wherever we want to go. Where are you going today, can we go?

PAUL: Were you trying to do any science.

JOHN: No.

PAUL: Were you looking at the lakes?

JOHN: The lakes.

JACK: The glaciers. We heard rumors there was Don Juan Pond which was named after the two helicopter pilots who first spotted it; we heard there was water, and said, there can't be.

JOHN: They came back and said, we found open water up in the dry valleys and we all said, you're nuts, and they said, come on and see, and George Meyer went out right away. We went too and walked around.

JACK: Ken Armitage was there.

PAUL: How deep was the water? When I was there, it was thin, you could sort of walk across it. Was it a lake?

JOHN: No, it was very shallow.

PAUL: Six inches or something?

JOHN: Yes.

PAUL: Did you look for anything or do any science?

JOHN: Yes, we were looking for anything living. We had protists in it.

PAUL: At that time there were dry valley lake projects because Armitage was there.

JOHN: That's right.

PAUL: We knew that it was warm. They didn't understand why it was warm.

JOHN: No.

PAUL: There were people out there and so you knew there were cool vents to see.

JOHN: But Don Juan pond.

JACK: That was liquid on the surface.

JOHN: And it's not frozen below. It's not very deep.

JACK: And it's not warm. It's really ice cold.

JOHN: Really cold. It was liquid because it was so salty.

PAUL: And they actually found a new mineral there.

JOHN: Yes.

PAUL: That would account for it.

JOHN: I think the first paper was George's, wasn't it.

PAUL: Yes.

JOHN: George Meyer wrote a paper describing it.

PAUL: I'm interested that you guys, without any real excuse, to just say I want to go to a dry valley.

JOHN: They had to fly to keep their flying hours, and they didn't care.

JACK: They liked to fly, they really loved it.

JOHN: They had to fly. So they were asking can we take you somewhere, because we have to fly or they would just fly.

JACK: On the long trips, like to South Pole and Byrd Station, we just hopped on a trip that was going. We would just say, let us know when you're going to Byrd.

PAUL: Did you both go to the Pole and Byrd?

JACK: They would just say, do you want to go, we have a spot and we'd jump on and off we went. But on the local stuff, it was just a matter of asking.

JOHN: We'd have breakfast with the pilots, and ask where you going today? And get on. And for Cape Hallett, I think we must have asked for that. I know I wanted another sample of *Odontaster*.

JACK: We went together.

JOHN: That was the first flight up there. They knew the base was in trouble.

PAUL: Do you want to talk about Hallett? Hallett is an enigma that nobody wants to talk about.

JOHN: We flew in and it was a beautiful site, right in the middle of a penguin rookery.

PAUL: So you were there.

JOHN: We were only there for about three or four days.

JACK: I don't think it was that long.

JOHN: Well, it had to be long enough for me to trap my stars.

JACK: Well, it must have been a Jamesway we were in.

JOHN: It had to be long enough for me to cut a hole, put the traps down, get a sample and that would take a couple of days.

PAUL: You sampled stuff there?

JOHN: I took samples, yes. It was one of the more important samples. We put a trap in and then we just sort of had to sit there.

PAUL: The two of you, or did Dearborn go?

JOHN: No. Just Jack and I, and the flight was mainly to break the end of the season for those guys. So we sat around and talked to them.

PAUL: And that wasn't associated with the methanol poisoning there, was it? That was a different incident.

JOHN: I don't remember that. Was there a methanol poisoning?

JACK: I think that was when, after this group left and they sent some people up from McMurdo and they found a cache of methanol and they drank it. Local Seabees, I think.

PAUL: That place seemed to be cursed by history.

JOHN: I think Don Douglas was up there about that time. He was working on the penguins up there. There was a penguin researcher there.

PAUL: Rich Penny.

JOHN: I thought his last name was Douglas.

PAUL: Okay, I don't know. Anyway, I was interested in that base

JACK: I don't remember much about Hallett.

JOHN: It was a gorgeous place and the people there, it was quite a thing to see, people who were wintering over and not getting along with each other.

PAUL: That's the history... every year.

JOHN: Is that right?

PAUL: Yes. You know, it was Kiwi-American issues, armed camps sometimes.

JOHN: There was a Kiwi base there, too?

PAUL: It was split.

JACK: Shared.

PAUL: Well, there was the U.S. and Kiwi shared the base and they shared the personnel.

JOHN: And they were all military people?

PAUL: I don't know, but they sure didn't get along. Year after year. So do you remember the commanding officer's name there when you wintered?

JACK: No. He was very good. We got along very good.

JOHN: Everybody got along with him. He wasn't very intrusive as far as I remember. VX six officers very good.

JOHN: The officers, they might have been boring but they were easy to get along with. They were very accommodating.

JACK: One thing we haven't talked about is the role of George Meyer. And he was very good as party leader. He enjoyed working with the officers, he spent a lot of time with them, and I think it was due to a lot of his work that we had no problems, because we worked mostly through George if we wanted something special.

JOHN: He was very good that way, and he acted very much as kind of an uncle for us and would give us these things and sometimes when he thought we were not doing the right thing he would gently let us know. We also had the sitreps (situation reports) to write every month. We had to do that and I remember George always being very disapproving of me, because I wrote those as a record of what I was doing and they were quite detailed with data. I was also hoping that Giese would read them too, so he would know what I was doing. I wrote him lots of letters of what I was doing and everything too. But George was just very concerned. He said, you don't ever put any data in your sitreps. Why, he said, you'll come out of the Antarctic and find everything you did is already published. I said, who would take such data? He said, you don't know how unethical scientists are, they'll take your stuff. I said they haven't been here, how could they write it up. I never paid attention to him, partly because it irritated him so much.

PAUL: Interesting. You had a big fire one year.

JACK: Yes, February. The paraloft burned down.

PAUL: That put the fear of God into the rest of us for years.

JACK: It did us.

JOHN: Yeah.

JACK: I was figuring out when we started the fire watch. We independently had a fire watch, started about that time, and probably as a result of that.

PAUL: Yes.

JACK: There was always somebody responsible to walk around in the middle of the night.

PAUL: That's right. We did that, too, and we took turns doing that. Civilian and Navy. We did our own.

JACK: Yes, we did our own.

PAUL: And there were a lot of cases in the PreWay heaters --

JOHN: Yes, it would be disastrous in the middle of the winter.

JACK: We were, of course, afraid of losing all our data. We were so afraid of fire. So there was always somebody, we shared weekly one night a week or so, we had fire watch duty.

PAUL: That was because of concerns about the heaters?

JACK: Just fire in general.

PAUL: How did your fire start? It started with the preway?

JACK: I don't know how that started. I just remember this huge fire, right down below the lab.

JOHN: That's right.

PAUL: Because of the wind and the dryness,

JOHN: The whole place could go.

PAUL: So did you have any other crises like that? How about fatal plane accidents or people falling through the ice and dying?

JOHN: No. We should have but didn't.

JACK: Everybody was very lucky. Our biggest danger which we didn't even realize at the time was carbon monoxide because John and I worked in very small huts with the gasoline engine running, no detectors, no nothing, we were locked up there all alone and it ran for 12 hours, 14 hours, sometimes, while I was doing my station work, with no ventilation. Why we weren't killed is just beyond reason.

PAUL: Did either of you have any scares or anything bad

JOHN: No.

JACK: Scares, I had one with John Bunt. We had the pole cat, and I was taking John out. He had just arrived. The ice house used to accumulate snow and it was sort of routine that I would drive around and get the snow moved away, because the ice was like a rubber sheet. In the hut we used boxes for shelves, and you would always make your shelf level, relative to the ice, when you were in the hut. Then the ice would change so when you went back into the ice house on the next visit, there were shelves going this way and that way, because the house would sink and tilt from all the snow. So we tried to keep the ice clear of snow. On the first trip out with John I took a run around the ice house and I guess it had been a warm period or something. The ice had melted and we ran across just behind the ice house and the pole cat dropped about four feet. I'm glad it was the pole cat because I just stomped on it and we went down and the trailer came down and we went up the other side.

PAUL: I've done that with that same pole cat several times.

JACK: That was the last time we drove around the ice house.

PAUL: My adventures were in the transition zone usually.

JOHN: Yes, transition zones.

JACK: You just wondered how thick is the ice below us. Let's get out in a hurry.

PAUL: Did the Navy have anybody go through the ice in the cats?

JOHN: Somebody went through the ice in Winter Quarter's Bay before us, a year or two before us. A tractor went down.

JACK: Tractor went down, they tied the ship to the tractor, and the wind came up and drove the tractors in. That was when they were establishing Hallett or bringing tractors back from Hallett. They had a problem. That's when they used to drive them with the ropes, going across the sea ice from Hallett. We didn't lose anybody. Bird was several years later.

JOHN: You lost Jeff Rude, Paul.

PAUL: Yes, but that was later. People died when I wintered over.

JOHN: Somebody died when you wintered over?

PAUL: One guy walked into a propeller. There were two fatal plane crashes, not at McMurdo but outside. I knew the people in every case.

JACK: Were you there when Tom Berg died.

PAUL: No, I had just left. I knew all about it. Like you, we got into that. But, you know, at the time death was sort of with me, and they made me sign a release, maybe you didn't. The release was that your body doesn't have to come back, it's a war zone sort of thing, we'll just bury you on site.

JOHN: I don't remember signing anything like that

JACK: I don't remember that either.

PAUL: I said I'd be happy to go down in the ice. So you had this on your mind, and a guy fell and broke his neck, and should have died but stayed alive in the middle of the winter. It was mid-winter night, the party, and he was in the fire department, and he was the chief, and so people didn't tell him what to do. He was upstairs, and took a run at his pole to show somebody and he missed the pole by about five feet, hit head first, and so, they actually had a mid-winter evac [evacuation] for him and it was a huge deal. So I had a lot of excitement that you guys didn't have.

JACK: We had a couple of helicopter fires where men were jumping out of helicopters on fire.

JOHN: I don't remember anything like that

JACK: We were on the ground for the most part when we had the fire. We were just told to get out and we did very rapidly.

PAUL: That's how I learned that you always wore gloves because the magnesium would be burning so, I guess it was from your fires, that when I fly on a helicopter, I wear gloves

JACK: I remember, the fire was right at the helo pad one time, and another time I remember flying back and we, with Tom Berg and being a geologist, he collected tons of rocks and they didn't know. He put these packages in and the helicopter got heavier and heavier. And Buddy [Krebs] was a wonderful pilot and he would take us anywhere.

JOHN: Yes, he was terrific.

JACK: We'd get started and go about a quarter mile or something and stop. I asked Buddy, are you having problems flying? No problem taking off, just staying up is a bit of difficulty. We hopped and skipped all the way back to McMurdo. We'd get up for a mile and land and get the rotor going again and take off again.

JOHN: You got back and those rocks were in there?

JACK: There were rocks and Tom Berg got shit for going up with rocks.

PAUL: When you had your fires, did the helo catch on fire?

JACK: Yes.

PAUL: ... and it burned up. It's magnesium, you don't put that out.

JACK: The engine compartment, they had the big engines in the front and that was where the fire was, and it didn't burn the whole chopper up. It was enough smoke and fire and stuff, that we got out quickly.

JOHN: Fast.

PAUL: Can you think of other exciting things?

JOHN: Tom didn't get out fast enough.

PAUL: He went back in.

JOHN: He went back in, that's right.

PAUL: He went back in to get his camera and the Kiwi went back in with him. Jim Brandau got the plane down, and it was on that cone in Upper Taylor Valley, and it's a steep cone. He had brought it down, and it bounced and rolled and then the dust settled. They all got out, and the plane was sitting there and they thought it might roll down more, but those two guys went running in and got into the plane to get their cameras, and when they got in, it rolled it down and it caught on fire. Were you there when Fio Ugolini had a helo crash in Wright Valley?

JOHN: I don't think so.

PAUL: That would have been in 1961, maybe that was after you left maybe.

JOHN: We were there all of 1961.

PAUL: Well, it's an interesting story.

JACK: I don't remember it.

JOHN: I don't either.

JACK: I remember it was kind of scary flying there because the chopper pilots depended on up-lift of air close to the cliffs and so we would go along, looking like we're going into the cliff and then up you'd go and then across. It's a scary place to fly.

PAUL: It still is. His thing was different as he was in his tent in the valley.

JACK: The plane, was it an Otter?

PAUL: No, it was a helo. They thought it was funny, because he was Italian, and there by himself, and so they always dusted him, tried to blow his tent away. So the guys were doing that, they had the helo on the side and Theo was inside his tent, holding things down and cursing, I'm sure. And then the helo hit the ground, and went into auto-gyration, and it shook itself apart, and the tail rotor went right through Fio's tent, and the dust settled and the guys were hurt, and Fio came out and saw it, had dealt with all this mess and got on the radio, and tried to get help. He had one of those radios that never worked, and forgot to let his finger off the send button, and forgot English so he's just screaming away in Italian with his finger clamped down. Nobody heard him at McMurdo, but they heard him at Pole, so somebody got on another channel and got somebody to go out and rescue the pilots.

JACK: That did occur when I was there, when you described the autogyration and the transmission. I remember that part, but I didn't know people had been injured, but I do remember now that there was an accident there where a chopper self-destructed on the ground.

PAUL: Yes. I have a picture of it. I went out and saw it.

JOHN: I don't remember that at all.

JACK: I definitely remember it, but not the people.

JOHN: I remember Fio.

PAUL: I'm interested in the management of science and George Llanos's role and how you perceived Llano and Curly, because Curly had two operations as I understand it. One, he was running the Bio Lab, which was separate from his fish program, and you guys were separate from his fish program.

JOHN: Right.

PAUL: So you weren't doing his respiration like I was.

JACK: No.

JOHN: No.

JACK: One question you asked, did Curly interfere with us or demand anything, absolutely none.

JOHN: Curly was wonderful. He just wanted to get us down there to validate having people down there doing science.

JACK: If we needed anything, he would get that as best he could.

PAUL: How about George Llano?

JOHN: George was one of these figure heads who kept us under his wing, watched out after us.

JACK: We didn't deal with him. Curly did most of that. We saw George more after they built the USARP chalet.

PAUL: Who were the NSF people you guys dealt with?

JOHN: George, Tony.

JACK: He was there on the ice.

JOHN: In the summer, nobody from NSF stayed over the winter.

PAUL: No.

JOHN: But George, he was terrific.

JACK: He was there all summers.

JOHN: Both summers.

JACK: He could have been. He was very good.

JOHN: There are a bunch of pictures here [in an Operation Deep Freeze year book], which are all familiar, of people who were there. The information officer, what's his name, Lytel, the publicity officer.

JACK: He was there.

JOHN: And he was really good.

JACK: There was nobody there that was really a pain.

JOHN: No.

JACK: We got in arguments with them sometime.

JOHN: Nothing like when I went back in the 1980s. Ken Moulton. George Tony. Bert Crary was there.

JACK: Transport. Traverses.

JOHN: And the director, Tom Jones came down a little bit. Remember him?

PAUL: Did you guys interact with Tom Jones, F.J. Thomas?

JACK: I did.

JOHN: No.

JACK: I interacted with Thomas. Because I wrote my thesis back at Victoria, at the shack, and that's where Tommy was. But Tommy, I don't think he was hired when we were down at McMurdo, I think he was hired after we got back but I did have a lot of interaction with Tommy. He did a good job running the program. But did he ever go down? I think he went down once.

JOHN: He could have, I don't know.

JACK: I don't remember if he went down.

PAUL: In 1963, I was just a peon for Curly, and I didn't have my own program until 1967. I wrote the proposal in 1965-1966, and everything I did, I had Llano helping me. I didn't have Curly helping me. Llano just made my career possible. I think that's true for a lot of people.

JOHN: Curly brought down Bruce Wing, and they gave me Bruce to help at Cape Evans. I went there my second summer with Bruce. I went out with a raft and dip net. I also had chest waders that I could go up to about here, and waders came up to here. Among other things he held the rope tied to me so I wouldn't float out to sea. Bruce was really helpful. Jerry Kooyman and Art DeVries came down that second summer too, working with Curly.

PAUL: That may have been the first year that Curly did the fish program. When was he doing his own research there?

JOHN: He was doing it that year, summer of 1961-1962. I don't know about the year before.

JACK: No, because he had that metabolism chamber, and that was installed the second summer.

JOHN: Second summer, correct.

PAUL: 1961.

JOHN: Yes, 1961-1962.

JACK: He didn't go down with Dearborn.

JOHN: He wasn't down there then.

JOHN: I don't know when he went to McMurdo the first time.

JACK: 1961 may have been his first year.

JOHN: Ken Armitage went down that summer too. I don't know how he arranged that, but he was on his own. He wasn't part of Curly's group.

PAUL: No, he wasn't.

JOHN: Larry Harris went down. He was an undergraduate sent down from Berkeley. I cannot remember who he was working with.

PAUL: He was working with Ellsworth Dougherty.

PAUL: Dougherty committed suicide so he didn't leave much of a legacy.

JOHN: I knew that, but I don't know what he had Larry doing down there.

PAUL: Rotifers or something.

JOHN: Dougherty was a micrometazoan fellow. He was pretty eccentric.

JACK: They worked up at Cape Evans quite a bit.

JOHN: Up at the ponds up there, and they had a lot of trouble because none of them thawed, so Armitage and Harris were up there looking for freshwater things, and it was all frozen. Armitage picked up on *Orchomenella* that we were collecting in our traps. He asked if anybody knew what they did in respiration and, and when we said no, he became the first study their respiration. I was very impressed how he could pick up on that so quickly, rather than sit around waiting for the ponds to thaw.

PAUL: Armitage went down to work in the dry valleys.

JOHN: He did, but it was all frozen, so he couldn't do anything out there.

PAUL: He's the one who discovered that it was warm at the bottom.

JOHN: He did do that too, yes.

PAUL: So he did do some things. He sampled water.

JOHN: That was probably also secondary. He was looking for lakes that had thawed, ponds, and they weren't thawing.

JACK: I think the primary lake was the one at Cape Royds or Evans.

PAUL: Royds has one.

JOHN: It was all frozen. So that may be why he went to the Dry Valleys and did the coring. He was another one, a young man, he wasn't going to sit around and wait for the things to thaw. He was looking for things to do.

JACK: Some of the summer support were not that way.

JOHN: That's right.

JACK: Some of them just came down and sat.

PAUL: Armitage was a student.

JOHN: No. He was a young assistant professor, I think.

PAUL: As a limnologist.

JOHN: Right, which is not what he does now.

PAUL: I'm trying to get a catalog of some of the early scientists that were there as really young people, because it's impressive. Curly had a really good eye for getting good students. There were other good students down there. Larry was a good student.

JOHN: Larry was.

PAUL: Ken Armitage obviously was. Can you think of others that impressed you?

JACK: Charlie Goldman was down. He brought two students down with him. I can't remember their names, one later became involved in University of Washington or one of the small universities out of Seattle. One of them was openly gay, and became more so. He was well liked by everybody because he would take part in theatrical things and he was a very creative person. He was involved in all of the base activities.

PAUL: That was just summer or winter?

JACK: Just the summer.

PAUL: It was Charlie Goldman's student?

JACK: Yes.

JOHN: It was 1961-1962.

PAUL: The Navy and everybody were open minded?

JACK: Well, he didn't advertise he was gay but he clearly was, as probably George was. I know George hated women. You knew that.

JOHN: But you didn't know if he was gay or just asexual.

PAUL: Speaking of women, about getting women to come to the Antarctic and work and be colleagues

JOHN: I spent a lot of time with the officers talking about that, and they always said, they couldn't do it. The Navy didn't have any place for women, they'd

be too disruptive, besides that, we'd have to make a separate latrine for them. I'd say you guys are Seabees, you can do that. That's not hard to do.

PAUL: They just couldn't talk about it, because it was a big topic for me too, in the group. You guys talked about it and things, so from the very beginning, essentially, the civilians wanted equality.

JOHN: It wasn't to have women down there to screw, I just thought it was stupid not to have women down there, there are good women scientists.

PAUL: I wanted both.

JOHN: Then they also said, we couldn't talk like Navy people, swearing and all. When I went down there again in 1984, my first time back, it was really a revelation to me, because I got on the C-130 at Christchurch to fly down, and after we were all strapped in, a little woman comes up on the flight deck and says, I'm Lieutenant Pauline and I'm going to fly you guys down today, and I was like what?! I realized things had changed, but people were swearing like they always did, and there were women all over the place. It didn't change the behavior at all. Men fought, however, in the bars. That's what changed, in the 1980s. We never fought in the 1960s. We would go into bars and things and even with the enlisted men, we didn't have fights, but men were aggressive with each other when women were there.

PAUL: The thing I got in the wardroom when I brought this up, not only do we have to build a separate latrine, but our drunken enlisted men will rape them. And we can't control that.... I just remember getting in their face, what do you mean you can't control them? You are the captain! But, I think the NSF, I think they were looking forward to having women in the early 1960s, or 1964 when they started building 225, one of the dorms, that had separate showers and toilets at each end. I thought it was clear that they were setting it up to have women, that the NSF was trying to deal with that issue. We were sleeping in it in 1967, and I think it had been built in 1964 or '1965. I think the NSF may have thought about including women, to their credit.

JOHN: There were a couple of women who were really outspoken about going down there. One was Mary Alice McWhinnie (from DePaul University). She was one of the first women scientists working in the Antarctic. She first went on the ships.

PAUL: She brought nuns with her as assistants [including Sister Mary Odile Cahoon]. She came down to McMurdo early in a winter flight with three assistant nuns, which had a big impact. There was a female geologist, a team of geologists

that came in, too, and they hustled them right out the valley, but John Oliver's wife was the first one to really be a part of the whole year. I had to threaten George Llano, because George was in favor of it, but then they overruled him and said we can't have this couple down there. I was talking to George, and then I wrote him a letter, saying there are strict rules at Scripps. You guys are going to get sued. I don't want to threaten you, but we will force this issue. In fact, it was a threat. Apparently it worked because then she went down and everybody was sweet and nice and it was spectacular.

JACK: But she clearly had improved facilities than we had in 1960, 1961, because we had one shower, at the far end of the base. Two or three stalls.

PAUL: That's what we had too.

JACK: And there was no way that you could easily convert it to a two-sex system.

PAUL: I'm sure you got the same things that I got because I lived in the same place and showered in the same place, when I showered.

JACK: Right. Tried to do it once a week, whether we needed it or not.

JOHN: That was about it. Yes, and you didn't need it.

JACK: It was cold.

JOHN: And Carl Hamner, he was down there. He had some idea that being close to the South Pole would disrupt rhythms.

JACK: He did biorhythms and Hoshisaki was with him, too.

JOHN: That's right, and he was doing rhythms in plants and hamsters.

PAUL: Why don't you talk the Russian observers. Every year, there was a visiting Russian because of the IGY.

JOHN: We had Sven.

JACK: Those were tourists. Essentially, they didn't do any research there. They came by to re-fuel.

PAUL: Maybe after you, there were people there that were scientists.

JOHN: We had a Russian. I don't remember very much about him anymore.

JACK: Was he working on cosmic rays with Cosmo?

JOHN: That's probably true.

PAUL: We had people and it was keeping an eye on each other, not military, but part of the treaty that was carefully honored, by the Soviets and the Americans.

JACK: He didn't winter.

PAUL: Ours didn't winter either.

JACK: But he was there for quite a while.

JOHN: He was there and a nice guy but I don't remember very much about him.

PAUL: You did interact with him then?

JACK: Oh, yeah.

JOHN: Yes, we'd eat with him.

JACK: We had weekly summer seminars quite often, and everybody would talk about what they're doing and if tourists came through, they would give a seminar to us, and on a fairly regular basis, so we got to know most of the projects, and that's when I really began to appreciate the value of having a lab where you have multi-scientific endeavors going on. You knew what the geologists and physicists were doing, that was an enlightening experience. That was through the seminars that we had. But I think he might have been with Cosmo, because he definitely was not in the Bio Lab.

PAUL: There was one guy that really got into sea ice physics and worked with Art [DeVries] over years measuring ablation, and so some of the Russian scientists were serious scientists.

JACK: Well, I don't know. I assume Sven was a serious scientist.

JOHN: I think he was serious scientist.

JACK: He certainly didn't appear to be KGB down there.

PAUL: Well, when you had your visitors that you just said, there was, in 1963, an inspection which was a big deal. The Americans decided to make sure that the treaty worked and that we had a team of inspectors that went to the Russian bases and they worked out of McMurdo and we entertained. They were biologists. And the whale guy, Vic Shepherd, was on that, for example. Art and I hauled him all over the place. The Russians reciprocated with two plane loads of visitors that came for about a week, and they came in the funny airplanes. They had all these

wonderful fur hats and things, and they were just so excited to be there. It was this great Cold War tension, and here were these cool guys. They would give away a bear-skin hat for a second class Seabee hat, and thought they got a really good deal.

PAUL: All the Navy guys were wearing these big hats around, and there were some interesting things too. They didn't want to fly on our helicopters, and the pilots didn't want to leave their planes, and they had to come in and eat. So there was a great deal about wanting to drive them out. Sometimes we drove them out in the pole cat, but the Navy took umbrage and made them fly, and they had the tail rotor come off as they were landing, and it was a very hard landing. Everything was okay and the guys got out white as a sheet. They got into their Ellyushin or whatever their plane was and never came out again, but it was good spirit.

JOHN: Yes.

PAUL: Right in the middle of the Cold War.

JACK: Well, ours were, as near as I know, just tourists, they were just on the way to Mirnyy [Russian Base].

JOHN: Re-fueled.

JACK: I know it was the first time the Russians had ever been there.

JOHN: It was, so it was a big deal. Visiting Russians

JACK: They had something like a C-130 and something more like a 707. Very nice aircraft, beautiful aircraft. They were certainly free with tours of the air plane and everything. I can't remember how long they stayed, about three days.

JOHN: It wasn't very long, but they turned the base upside down. They were all over the place the first day or two, and then they were kind of subdued.

JACK: Hung over.

JOHN: Badly hung over. The Seabees saw that and of course tried to get them to drink more, and no, no.

JACK: It was a good visit and as near as we could tell, there was no ulterior motive there, they just came through to get some fuel and have a good time.

PAUL: That's really what ours was, too, but it was done in your face, because the Americans had...

JOHN: Had done it before.

PAUL: When the officer arrived, did the Japanese come when you were there?

JACK: No.

JOHN: Oh no.

JACK: That was the only international visit, I think, was the Russians, as I remember.

JOHN: Here it is. Sven [looking in the Deep Freeze yearbook].

JACK: He was a glaciologist.

PAUL: For me, being a political animal, I suffered a lot in my year without getting information. You guys sound like you had ham radios that worked, and I didn't.

JOHN: We could call out. It was a small ham shack.

JACK: Near the mess hall.

PAUL: Call this person and they patched you through.

JACK: Oakland.

JOHN: He was very accommodating and he was doing it as a volunteer. Everybody could hear everybody's conversation, so you'd be sitting there waiting for your turn, listening to some Seabee talking to his wife and asking about how is the car, how is the dog and the kids. Nothing about how are you?

PAUL: So, did you feel isolated then? You must not have felt as isolated as I felt.

JOHN: You knew the winter was going to be over.

PAUL: But you weren't worrying about Cold War things?

JOHN: No, that political stuff was not there at all, except I remember talking, particularly to some of the officers who were kind of anxious to get into Vietnam and get that over with. They were so confident that all we had to do was just put U.S. military might in there, and it would be done, in a week, you know. I was kind of horrified, but this was 1960.

JACK: 1961.

JOHN: The Cold War was on, but it wasn't like there was anti-war.

JACK: No, it wasn't. That must have been the time when the Russians put their first astronaut on. I remember in the mess hall they made an announcement from President Kennedy, announcing there had been this spectacular advance in space.

PAUL: [Yuri] Gagarin's flight around the world.

JACK: Yes.

PAUL: You were there for the Bay of Pigs, the invasion of Cuba?

JACK: I don't remember.

JOHN: I know about the Bay of Pigs, of course, but I don't remember us feeling one way or another about it. Bay of Pigs was before that, wasn't it?

PAUL: Maybe it was.

JACK: We were home for the Cuban Missile Crisis I remember that. We were back at Stanford by then; I was already in Stanford for Bay of Pigs.

JOHN: That's right.

[Bay of Pigs was April 1961. Cuban Missile Crisis was October 1962.]

JACK: I think primarily, all of us were worried about our research and if we needed things, this is how we got things to us on the first plane in. I know my wife bought a tape recorder, that was her anniversary, instead of wedding, engagement ring, we bought an Ampex tape recorder and, because we couldn't afford both, so we hooked it up to telephone and she would record all of the phone patches. Then, quite often you couldn't understand a thing, but she would record everything and then go back over it, and figure out what we wanted. So when the first plane came in, we had everything we wanted, including Curly sent down "phocacidal pellets." We weren't allowed to have firearms but we had a pistol that we used to shoot seals. I didn't have any shells left and so I asked on ham radio for them to send some down, so it was "phocacidal pellets."

PAUL: Other programs ... Sladen would have been there, were there penguin researchers?

JOHN: There was a picture of Don Douglas [in Deep Freeze yearbook], and he was up at Hallett.

PAUL: So nothing was going on at [Cape] Crozier when you were there?

JACK: Before yours, I think there was some Crozier work going on, because I was at Crozier, and so it must have been the first year.

PAUL: That all developed after, between us.

JOHN: Yes.

PAUL: How about Lynn Gressitt?

JACK: He was there.

JOHN: With Keith Woods, and ...

JACK: And Robin Leech.

PAUL: So you had an insect program. Did you interact with those guys?

JACK: They were at the lab all the time. They had Otters fixed up with big aerial plankton nets. I never went on a flight with them or anything.

JOHN: No.

PAUL: They would have been just summer though?

JACK: Just summer.

JOHN: Yes.

PAUL: Let's talk a bit about John Bunt?

JOHN: Well, I don't know when he came out.

JACK: He had to come down at the end, the first early flights at the end of 1961.

JOHN: That's what I thought.

JACK: He was in the pole cat with me going around the ice house.

JOHN: So that would be early on. John Bunt was sort of a pioneer. He was the one who spent the year up in Mawson. I spent a lot of time talking about what he found there. I had found that *Odontaster* had larvae, and it was thought at the time that in the Antarctic, nobody had larvae, so I made the mistake of thinking they were benthic. They had larvae but they're not in the plankton. Jack never found them. John never found them in his plankton work at Mawson, so I assumed they had to be benthic larvae and that's what I published.

PAUL: It appears Bunt did do some early diving.

JOHN: He did, at Mawson.

JACK: He didn't dive at McMurdo. He worked on phytoplankton, probably did some C-14 work, which would have been the first of the C-14 done at McMurdo.

PETER: Bunt says he did, using Vern Peckham's suit. It's documented in my Antarctic ice diving history.

JOHN: He might have.

PAUL: He might not have done as much science. You were before Vern Peckham's diving.

JACK: We were there.

JOHN: We had no idea he was diving, at least I didn't.

JACK: No.

JOHN: That was something, because that's one thing the Navy was against, was diving. There was never any question about it.

JACK: So they would have kept it very quiet.

JOHN: When I found out Vern had been diving there, I was really irritated because I wanted to have somebody tell me what we saw through the hole, what it was like.

JACK: I spent a lot of time with John Bunt. We went to Paris together and I spent a lot of time in bars and stuff with John, and he never mentioned any diving in McMurdo at all. He talked only about his official work.

PAUL: He used to talk to me about it, because when I went down to dive, he had some divers down there, a guy named Lee and somebody else. They were there before I got there, and they were diving, and Bunt told me at the orientation meeting about his diving. I think he dove on the other side of the sound, maybe getting out sight

JOHN: Was he in my hole?

PETER: Vern was just off in your area.

PAUL: That's what gave me an idea of where your hole was. We should talk about the diving because Peter has this whole interesting history. Vern, I'm sure, did it through your hole but that would have been toward the base from where your pipe fell through, your casing fell through by about a hundred yards, because Vern went down and put circular rings around and they were all over, the top part of the wall, the cliff there and then they were along the bottom, about 130 feet maybe. He must have had 20 of them. I took pictures of them very carefully and sent him the pictures, and he was going to look for succession.

JOHN: Right.

PAUL: And that was all around where the cliff is, and, then your casing is now a hundred yards farther away.

JOHN: If I remember from his paper, he did the first dives when we were there, but then didn't do anything more until much later. So he wasn't diving most of the time we were there.

JACK: No. I can't honestly remember him ever diving.

JOHN: No, I didn't either.

JACK: We would have known the hoops.

PAUL: It's interesting that he'd hide the tanks and compressor.

JOHN: What really got to me was to find out Curly was behind it all. He was able to smuggle all that stuff down.

PETER: I don't think they had a compressor. From what I was told, Richard Harden said they were filling scuba tanks from larger tanks. The compressor was on the base, but they were filling scuba tanks from other tanks.

JACK: I never knew there was a compressor on the base.

PAUL: The fire department had one. There were compressors around, but still, hiding it.

JOHN: How did you get into diving there?

PAUL: How did I?

JOHN: You went down there the first year.

PAUL: Curly said, oh, absolutely not.

JOHN: He told us that, too.

PAUL: We can't have any diving, that's forbidden.

JOHN: He told me that, too. Then I found out about Vern and I thought, what the hell is going on here.

PAUL: Exactly, isn't that interesting, and Vern made 37 dives, one was to 154 feet.

JACK: That was just not on the scope at all. It was just one of the things that was not going to happen.

JOHN: So then you went back and proposed to go down and dive?

PAUL: Yes, but then there were divers in 1964, and 1963. Jerry Kooyman had a suit and was recreational diving for photos as well as watching seals diving and that's when Carlton Ray came, and Jacques Zaneveld. Zaneveld had a program with one diver who would go out with a line on him. Nobody made more than a handful of dives, maybe seven or something, but they were diving, and the Navy wasn't stopping them. Curly was there and Kooyman and us too, and no, you can't do it. Navy won't allow it, and I'm pulling Jerry's stuff up. Curly himself had hidden Vern while he was doing it.

JOHN: Wish we had gotten a hold of Vern earlier, or Curly for that matter. I don't know what he was thinking.

PAUL: I wonder if anybody ever did talk to Curly.

JACK: I don't think so.

PAUL: I mean, that's the problem. You guys, when I came in 1963, you guys were writing your theses, and I think you were hiding from Curly pretty effectively. You weren't ever around the net loft, and Dearborn was, and Curly would stoke up his pipe and start a story, and Dearborn's eyes would just glaze over, and he'd just lean against the wall, and ooze around the corner.

JOHN: Yes.

PAUL: So that's why nobody interviewed Curly.

JACK: Were you on the dog trip with Dearborn, out to the glacier, I think it was one of the ice breakers? We took the dog team out.

JOHN: That must have been your first year.

JACK: First year, and that's when they had all the dogs.

JOHN: The dogs were gone when I was there. The dogs were only at the New Zealand base.

PAUL: So the dogs were there, between you and --

JACK: 1959, 1960.

PAUL: The Navy had dogs?

JACK: The Navy had dogs. It must have been John and I, only time down there that I ever listened to a padre, and he came with some wild idea that we would take a dog team up to this Glacier ice breaker, which were four or five miles up the sound. If we took them up, they would send a chopper up and pick us up and the dogs and everything and bring us back down. We said, okay, we can do that. We envisioned, like you see in the movies, we're riding on this sled, and it's going to be great fun. Well, it's not the way it works. You run behind the dogs or in front of the dogs, trying to get them to run.

JOHN: That's right.

JACK: Then of course, he hadn't asked the VX Six to pick up the dogs and the pilot said, no way a dog is going in my helicopter. Then it got stormy and we couldn't fly anyway, and we had to take the dogs back to McMurdo through the blizzard. We were out 16, 18 hours with these stupid dogs, and was it a memorable trip. When we got there, they allowed the people on the Glacier off to go on the ice, and when they're off the ship, they can have beer. That was the only thing they were interested in, drinking beer, and the fact that we were there with this dog sled made absolutely no impression on them at all.

PETER: Were you aware, after you started publishing, that there a burst of interest in Antarctic research? Were people contacting you or talking to you at conferences, or was it just another article published?

JACK: John can speak to that better than I could.

JOHN: Probably not, I went off to Egypt, I never got much feedback.

JACK: I went off to Canada.

PETER: It wasn't like it was a huge deal?

JOHN: No. Not at all.

JACK: No. There was a meeting in Paris, Antarctic convention meeting or something.

PAUL: It was the first SCAR [Scientific Committee on Antarctic Research] meeting.

JACK: That was pretty impressive because there had never been to anything like that.

JOHN: I didn't go to anything like that.

JACK: I remember that we were guests of the French government and we had first class accommodations, and all the pomp and circumstance to go with it. We went into the palace, and there were guards around all dressed up.

JOHN: Did John Dearborn go?

JACK: No, just John Bunt and I.

JOHN: John Dearborn did keep in the circle with the Antarctic group. I didn't at all.

JACK: He got more into shipboard work.

JOHN: Shipboard stuff, that's right.

JACK: And did he ever go back to the ice?

JOHN: I don't think so.

JACK: I don't think so.

JACK: Shipboard from then on.

JOHN: Right.

PAUL: Did you give a talk on your thesis? That was before your thesis.

JACK: No. I gave a talk in Paris. I think it was on my lipid stuff.

JOHN: The *Euchaeta* stuff.

JACK: It had to be 1962.

PAUL: Yes, it would have been 1962, so you had finished all your data collection.

JACK: Yes.

JOHN: But not written it up.

JACK: Not written it up at that time, and the *Euchaeta* paper was nice and neat.

PAUL: One of the things I wanted to ask, because I'm not an oceanographer at all but obviously we needed it, and your paper was just a dog-eared Bible for us. The oceanographic community wasn't doing anything much more sophisticated than you were, it seems to me, you were right there.

JOHN: That's right. You were the one who pioneered that. Our oceanographer at Santa Cruz, I used to talk to him, I would like to know about the currents and stuff, and he said that's too inshore.

PAUL: But Jack did that, and it was quite unique.

JACK: I didn't know very much about oceanography at the time either.

PAUL: But you did it, and you learned a lot, and laid the ground work. Jim Barry and I did a lot of that.

JOHN: That was the only kind of oceanography done there.

PAUL: That's right. So I think what's remarkable about your work, Jack, is that you were way ahead of the curve in doing coastal stuff.

JOHN: How many people are doing that?

PAUL: It's now become popular because there's money. But at the time, oceanography was out there in the blue water.

JACK: The only thing we really wished we had thought about and had done is to bring an echo sounder down so we could watch the scattering layers. That would have been a good addition but it hasn't been done.

PAUL: I don't know that you would have seen anything.

JACK: Definitely, you could see the plankton down there. I'm sure you could.

PAUL: I don't remember it coming up and down, in my diving depth --

JACK: No.

JOHN: It would be deeper than that.

JACK: I assumed that during the summer, particularly during the spring when John said there was lots of light, you would have had some vertical migration going on. I did pick up some, in the vertical hauls I made. I couldn't do it frequently enough to come up with definite rhythms.

PAUL: Did you go in there with your background from Stanford?

JACK: I had one course in general oceanography and that's it.

PAUL: But you were intuitive about the questions. They were the most appropriate questions. The salinity, etc, and you understood the physics, I thought.

JACK: Yes.

PAUL: Very well. You understood where the water was super-cooled.

JACK: Well, not before I went down. No, I had no idea.

JOHN: But when you were getting minus 2 degrees water, you realize something is --

PAUL: Something is wrong, and it bothered you in the write up.

JOHN: That's right.

PAUL: And it wasn't a mistake, it was minus two point two.

JACK: Minus 2.2. I think that was the lowest.

PAUL: And that's when you see the crystals.

JACK: Yes. You got below minus 2.0 or 1.8. I think at 1.8, you got the crystals.

PAUL: I used the crystals to tell me which way the current was going. The crystals tell me it's coming from the south.

JACK: I think other than the Kiwis, I did the first sort of long-term current studies down there, too. With the Ekman current meter, and that's probably when I was watching the seals, because the Ekman, you had to lower it down and leave it there, send a messenger down, and turn it off. So I had 20 minutes to sit there and do nothing.

PAUL: But you were thinking about the oceanography --

JACK: I was thinking about the plankton, and the oceanography was just to support it.

JOHN: We were plankton biologists.

JACK: I had to know the oceanography to understand the plankton. It's not that I went down there to be a physical oceanographer; it evolved because I had to have the information.

PAUL: It was unique, and here's this guy from San Diego State who had played around with Carl Hubbs but you weren't a physical oceanographer.

JACK: The interesting thing, I would never say this until I'm retired, that I took a course in oceanography at San Diego State from a physiologist, who I'm sure was teaching this course, because it was assigned to him.

JOHN: He was forced to.

JACK: Because he was low on the totem pole, and that was my only oceanography. Because of the work I did in McMurdo and my thesis, I was hired as an oceanographer in my first job, and I taught oceanography for 25 years and I had huge numbers of students that went on to develop oceanographic careers. In fact in the Victoria region, almost every of them came through my classes, but I never had an oceanography class, but I learned an awful lot in McMurdo, and I read Sverdrup [The Oceans; their physics, chemistry, and general biology] several times.

PETER: One reads about the careers of Scripps scientists, and they started off and just learned as they went and became eminent. It's not like they had classical education.

PAUL: I dog-eared your paper when I was doing that anchor ice paper, and I still have trouble figuring out why lower level cuts off so abruptly.

JOHN: Everybody does. Did you see the new Mark Denny paper, on anchor ice? It's the first one looking at it seriously since your work, the anchor ice cuts off at about 30 meters, and we don't know why.

PAUL: He doesn't either?

JOHN: No.

PAUL: I looked through Jack's thesis that has an appendix, and I thought it must be something in there. I asked people, and they gave me a bunch of stuff and I came up with ---

JOHN: Got to be pressure.

JACK: I assumed pressure.

PAUL: Well, the pressure is off by an order of magnitude, a thousand meters, is sort of where you get the pressure. It's the super cooled water. But why the anchor ice doesn't go deeper ever, and it's true around the continent? You've got this 30 meter thing.

JOHN: So it's the other way around... it's super cooled water because it's near the surface.

PAUL: That's right. It's come up, in our case it came up from under the shelf, and it comes over the sill and starts dropping your crystals. Maybe you had it figured out. But why doesn't it go to say 40 meters? Everybody at the University of Washington that I talked to, I had to explain your paper to them. You were way ahead of everybody, and in a sense, I was trying to figure this out. I think it is still a really valuable paper.

JOHN: Yes.

PAUL: In every way.

JOHN: I was surprised, it's been sitting there for so long, and Mark Denny went down and saw it. He was looking at crystals and why they were forming on different things and why they didn't form on some animals and did form on other animals. They kept thinking they were forming, and I kept telling him, they're not forming, they're sticking.

PAUL: And once they stick, they make a flat platelet because of a piezoelectric process, I think we figured out. They go flat as they enlarge.

JACK: They attach on the wire, flared out flat.

PAUL: Right.

JACK: And they would be that big around sometimes, on cold days.

PAUL: Anyway, thank you, for, being there. You saved my career.

JACK: Purely accidental.

PAUL: It saved my career, it gave me what I needed.

JACK: I was using chemical techniques for salinity, and my concern was that I realized that if the Nansen bottle went down and took crystals in with the water, --

PAUL: They melted.

JACK: Right, and my salinity would not be correct. I remember doing an experiment, and it must be in my thesis somewhere, where I put plankton netting over the Nanson bottles, because that was my concern about the crystals, they were screwing up the data.

PETER: Paul, when you say, it made your career, you mean the physical?

PAUL: Understanding the benthic community in the physical sense, that's right. There's still another mystery in my mind. On the other side of the sound where you have really old ice, and it is 25 feet thick because it's a stable point, platelets form on the bottom of the ice and on the ice ablates from the surface. About a meter and a half a year, there's a fairly fast change, in the middle of that is a huge layer of fresh water. In the summer, there's a freshwater cell that goes down about 15 feet under the ice, and so the fresh water would freeze at sea level and it's sitting on top of minus 2, minus 1.8 degree water, and you don't have anything freezing. You can come down there in October, after the winter, and drill a hole with a drill or something, through that ice over there, and there's a lake of fresh water within the ice, and why doesn't it freeze?

JOHN: Fresh water

PAUL: Inside the sea ice.

JOHN: That doesn't make any sense.

PAUL: Over the winter.

JACK: How do you know it is fresh water?

PAUL: You can taste it, you can see it when you dive through it ... oh, it's fresh water. Tony Gow found it in 1963, but did not know how much is there.

JACK: Something in there keeping it from freezing.

PAUL: Well, maybe you can't taste it but there's got to be something there.

PAUL: Tony Gow, was there when you were there, and now he just says, it's super-cooled.

JOHN: No, there's crystals all over the place.

JACK: It could be super-cooled. There's something in there keeping it from freezing, because that's basic, zero degrees, fresh water freezes.

PAUL: That's what I understood. In 1963, Tony was bringing it over. He discovered it, and Gordie [Gordon Robilliard] and I discovered it when we dove through it. He came in October of 1963 with water samples, and we ran them, and they were distilled. He couldn't believe it. It was a big thing for Gordie and me to dive into and that was in 1968, 1967. But, it's fresh.

JACK: Something in there, some organic molecule or something.

PAUL: I wanted you to have a mystery issue.

JACK: Definitely is a mystery, I'm sure it's not fresh water.

JOHN: One of your main things for your career, was having Gordie, right?

PAUL: Yes.

JOHN: I mean, there you had somebody you could work with.

PAUL: Yes.

JOHN: That's really, really crucial, to have a couple of people who you can depend on.

PAUL: You guys worked together. You had Jack and Dearborn.

JOHN: That's right.

PAUL: And Gordie and I worked together.

JACK: I think when you go back to the very first question you asked, it makes John Dearborn's work even more remarkable because he had nobody to talk to in his first year.

JOHN: That's right.

JACK: We worked close as a group and could discuss things back and forth. But John didn't.

JOHN: That first year,

JACK: That was remarkable that he did the sorts of things he did without any feedback or encouragement or anything. We constantly talked to each other.

JOHN: That's true. He had no encouragement either. I mean, what Curly wanted him to do, and he was Don's student and Don I'm sure was thinking, this was a little bit removed from what he would do.

JACK: Don was a pretty straight arrow about what he wanted to do.

JOHN: He was, he wanted people to work in the intertidal, period.

PAUL: Dearborn, not only did he work alone, but he was a damn good invertebrate zoologist. He found things, that I've never seen even though I looked, things like Cephelodiscus and Rabdopleura and he found a fair amount of things like priapulids.

JOHN: Right.

PAUL: I don't know how he found them.

JACK: He was meticulous. He really was meticulous in going through things.

JACK: That's one of the big changes that occurred, was the group size increased, and that helped a lot. The other one, we were talking earlier about another reason why you felt you didn't get cooperation and we did... we didn't ask for very much. It was given to us.

PAUL: I didn't ask either, and that was a problem.

JACK: We didn't want anything from them.

JOHN: We made all of our own stuff. I could weld. I learned to weld in high school, so all of our traps we welded together.

PAUL: You welded your own traps?

JOHN: You just go to the Navy shop and use their equipment.

PAUL: Welding is easy enough, but my traps were wired.

JOHN: I made solid traps; you have all that equipment up there, and supply area.

PAUL: Yes, I helped with Graeme Johnstone, and I built a fish house, a really good one I was very proud of, in that garage. But, in the 1960s, 1964, there was a geologist named Bob Rutherford who became quite important, and maybe it was 1963, but in those days the geologists were in that building, building the boxes and everything. We all took care of ourselves. When the chain saw broke, I had to learn how to take it apart. My sense was, somebody put this together, I should be able to see how it works. They were good. I remember Rutherford up there building the boxes for all the specimens, and just in there by himself, a young guy, he had a big pipe. They all smoked a lot and somebody came in and told him the Navy had

cancelled all of his flights. He says, no, and he fought with the messenger, and the poor guy just beat it because he was just telling Rutford. He just sat there, without saying anything. I'm sitting working on the chain saw, and his jaw started working. He is just staring at me, and his jaw is working, and the end of the pipe fell off. He bit it off! So, you know, Rutford can attest that the Navy wasn't very cooperative.

JOHN: We did do bartering sometimes with the Navy.

JACK: Yes. Remember the beer episode.

JOHN: Yes.

JACK: They used to store the beer outside one of the buildings, and, being scientists, we watched the beer decreasing, and we calculated when they would run out of beer. It was quite awhile before the support ships came in, and so we bought a load of beer and had it delivered to the USARP barracks. I know my room was just flat from the bunk down, it was just beer cases, and I think your room was the same. This was a lot of beer. Then when we wanted something done in the summer, we'll leave a case of beer out there for you if the ice house is plowed. Done. I think the base ran out of beer about October, and we had it throughout the summer.

PAUL: But you guys ate well?

JACK: Yes.

PAUL: And you had the beer.

JOHN: Very well, and we had the beer. We had a weekly run of buying things. We could buy hardware.

JACK: George had the keys to the USARP locker too and he was generous. Any time --

JOHN: That's right, but when we returned in the '80s it was restricted.

JACK: Any time we had a party, we could get a supply of ethanol to make punch.

JOHN: George was good about that. That's right. That's a different time.

JOHN: We also had those photographs of nude women, we could give to the Seabees and oh, we'll give you this photograph, if you go out and plow tomorrow. And, those were really worth a lot.

JACK: Yes.

JOHN: And we had the negatives.

JACK: Which we inherited from Ollie, I think.

JOHN: Some of those were Danish girls. They were really risqué for those days, it actually showed pubic hair and that was pretty exciting. We had negatives, so when we needed something, we'd just go in the dark room and make a couple of prints and go out. We took Vern into the dark room and I showed him all those negatives. I said, these are worth almost more than anything on the base. You can get anything you want from the Navy. Oh, filthy, he said, and he threw them all away. What are you doing? I said. Yes, I was horrified.

JACK: All your barter power...

JOHN: I didn't care about the photos themselves, not too much anyway.

PETER: You were trying to get science done.

PAUL: I know about the Tucker snowcats, and that Tucker snowcat is a cool machine.

JACK: Well, I had a tiny one that was really cool.

PAUL: I love those things.

JACK: I love them, too. I didn't like the Nodwell.

JOHN: The weasels were fun to drive.

JACK: We used to go out and get them on a spin, when there was wind and the ice was clear --

JOHN: You could slide around.

JACK: Pull one of the levers and you just spin.

JOHN: They didn't like it when we did that. Sometimes the tracks would come off.

PAUL: At least what happened with the track master, when one of the Navy officers was spinning, and they spin like a top, but he did it with a track master, and it tipped over. The fuel tank spilled onto the exhaust, and the thing blew up. Blew him out of the vehicle. He survived. So spinning a track vehicle, it's got a risk factor.

JACK: Well, weasels are close to the ground. Transportation was always a problem, and sometimes, right after summer support left, I got a small two-person snowcat which was like a model A snowcat, had a little Chrysler engine in it, and it was a tiny thing. Not like the Tucker snowcats and not like the big black ones. This was a tiny guy, and I had it all winter, and it was my snowcat to use. We went up to Arrival Heights on it to watch the sunrise one time, and if you wanted to go anywhere, we just grab it and go off for a drive.

PAUL: Did you have a block engine heater?

JACK: No, we had Herman Nelsons.

PAUL: Oh, you put the Herman Nelson on them.

JACK: And a can of ether. Nodwells came with a little ether injector, and it never put any ether in, but the can of ether worked just great.

JOHN: Just poured that in.

JACK: Boom. Here we go.

JACK: Tell the White Island story, too, when we --

JOHN: You know, I only remember a small part. But Jack and I, we had a lot of time, after we set the traps, and so we were exploring, up there. We went out onto the ice shelf itself, because we were kind of behind where all the ice kind of crunches up together.

JACK: Pressure ridges.

JOHN: Pressure ridges. We got out of the pressure ridges and got out on the ice shelf and it was just as flat as you can see. It was a beautiful day and we had banana sled and some stuff on it. I don't remember that we were out looking to blow a hole.

JACK: I was carrying explosives.

JOHN: And there were ice cracks in the ice with snow covering them, and most of the snow was blown away, but there were areas with snow on it, and we were walking side by side, and Jack stepped right in the middle of a snow covered crack.

JACK: Well, you pointed it out, and we had some communication difficulty. I thought you were pointing out where you wanted me to step. It was windy, and

John pointed out to step there, and I thought that's where I wanted to step. Down I went.

JOHN: I looked down and I couldn't quite see the bottom but Jack was dangling there looking like, what's ---

JACK: What happened.

JOHN: Got him out of there as fast as I could.

PAUL: That close? Because I went through one of those at Turtle Rock, and you don't have a chance, I mean, I'm down. But I just went down a little ways.

JOHN: This was the ice shelf so it was thick ice, I don't know how far it was to the bottom.

JACK: As you say, you're just gone. I don't even remember, I remember you pointing to the spot, and I remember stepping on it, and that's it.

JOHN: I just remember looking down, and you were not looking very upset about it and I was, like, God...

PAUL: That's what happened in the Worst Journey [Apsley Cherry-Garrad "The Worst Journey in the World"], those guys kept falling through those things because they were out in the windless Bight and you couldn't see.

JOHN: Couldn't see.

PAUL: They kept going down so they had their skies tied to the sleds to make a T, and they were hanging, and it happened several times.

JACK: This was just a little narrow crevice, and it was not a problem. I remember stepping on that spot, definitely, and that was it, gone.

JOHN: I remember seeing you step on it and thinking, God... because we were pretty careful about watching where the snow was.

JACK: That's why I stepped there because you obviously saw something and pointed, step here.

PAUL: Where Jeff Rude went through and died, I don't think they could see it. I was there a couple of days later, and there was just a hole. You didn't see the crack. It was a tight crack. They had a big storm so you had that really hard snow that was very firm, and it just looked the same. He just parked his vehicle on it, three or four feet further, it would have been at an angle and he probably would have lived. They stopped to drill, and down it went.

JOHN: I think those guys that were up by Arrival Heights, somewhere over here, we lost those two guys, that was a crack, too, wasn't it? I think you said it was on your time, sometime after we were there?

PAUL: Yes, some hikers fell through.

JOHN: That was the end of anybody being allowed to walk up there.

PAUL: That's right.

JOHN: Before that happened, we went everywhere.

PAUL: That was 1966, maybe, when that happened.

JOHN: I know when we got back there in the 1980s, we weren't allowed to walk up anywhere in there.

JACK: We used to go up there all the time.

JOHN: Walked up to Arrival Heights and Crater Hill.

JACK: In fact, there was a good road that went up there and came out that way.

JOHN: That's right.

JACK: I wish you would have been there for my Ph.D. defense, Paul, it would have made it really easy. I'm sure they didn't share your opinion.

PAUL: They didn't know what they were talking about. Nobody did. Nobody at Scripps would have done that.

JACK: I have the feeling that they just gave me my Ph.D. because obviously I did a heck of a lot of work, whether it was of any value or not.

PAUL: Who was on the committee?

JACK: Curly, Abbott, who was the environmentalist at that time? Paul Ehrlich.

JOHN: You had to have somebody on the outside.

PAUL: Nobody who knew anything about oceanography?

JACK: No, nobody there. Fortunately, they couldn't evaluate it. They did a lot of numbers here.

JOHN: Who was there for mine? I went up to Turtle Rock, and got those animals that were eating seal shit. You can look down and see clumps all over the place, all the turds all over the bottom, and that's what the sea stars were eating. Well, how much nutrition do you get out of a seal shit? That was the big question on my orals.

PAUL: Well, now, they have these pictures, and my argument is, very little over the long term.

JOHN: Of course.

PAUL: Very, very little. But the *Odontaster* likes a seal turd, no doubt about that. But what you have in the cracks are the brown streak of diatoms in there, and it's all diatoms, fortunately.

JOHN: Right.

PAUL: So the whole business about recycling seal turds, it's, well it's nuts.

JOHN: It's not going to be very much, and there's not that many places where there are piles of it.

PAUL: But there are still proposals now to study that.

JACK: One thing we didn't mention and that was an unknown fact, really, that this brown layer on the ice was diatoms.

JOHN: That's right.

JACK: They used to call it seal shit. On the bottom of the ice. The pieces of sea ice would turn over when the ice breaker plowed through it, and it was obviously seal shit. We didn't know when it formed or how, and I think when we put the photo cell down and we got light measurements, we realized these were growing diatoms on there.

PAUL: It's a whole ecosystem. Careers have been made on that.

JOHN: After the winter, the new ice is translucent. We see the bottom through holes in the ice, and it disappeared, as the diatoms grew on the underside of the ice, and blocked the light.

JACK: I had the light meters down at that time. We just drilled a hole and modified the light meter so it would go down the small hole, using the SIPRE ice

corer. I would just unfold the light meter and we froze it in. We had no way of knowing whether it was still functioning and the light decreased rapidly. Of course, that corresponded with John's visual observations. Then, when the water warmed up to balmy 0.5 degrees or something, it cleared up, and I think that was the first time people realized how dynamic the cover was.

PAUL: That was the first time, yeah, it was the first time anybody knew that there was a problem.

JACK: Any of these things would have made a wonderful Ph.D. thesis all on their own.

PAUL: Well, the sea ice ecosystem, there's been several careers, probably twenty people in Alaska.

JOHN: Goldman certainly built on that, and Neal Sullivan.

PAUL: Rita Horner, there's a whole series of people who have done that, and the marginal ice zone was all built around this sort of thing.

JACK: I think when we went down, people thought the bottom of the ice looked like the top of the ice, essentially.

PAUL: Fair enough, why not.

JACK: And that was it. Didn't realize how dynamic it was. We really were amazed when we got all the ice crystals up, because we didn't understand where they came from.

JOHN: Right, right, or even the break out of the sea ice, and how important that break out was as far as the productivity up and down the sound.

PETER: John, you mentioned seeing the rocks and the animals underneath the ice. How did you come to understand that that was anchor ice rafting?

JOHN: How would it get up there?

PETER: You just instantly realized that the ice was lifting it up off the bottom?

JOHN: You have to.

JACK: I think we talked about it in the lab. First time was, we talked about it at your station, how in the hell did they get up there. And we discussed it --

PAUL: Did you coin the term anchor ice?

JOHN: No. I don't think so.

JACK: I think John Bunt did.

PAUL: I think you used it

JACK: I think John Bunt used it. He made the term upontic, so he certainly knew about that, and I think he did use anchor ice. We were more concerned about lifting.

PAUL: You published your thing as a letter.

JOHN: Well, that was the thing about the fish on the ice.

PAUL: I was doing due diligence to my predecessors and I found that. When I wrote my paper, I thought I was pretty much on my own, except for your observation, and we had Curly and Swithinbank paper. Debenham had it, and I talked about these things. I didn't mention Bunt and I don't think I looked at his stuff, but Swithinbank wrote me a letter after that paper, and said, that explains it.

JOHN: Right.

PAUL: ... and it all came together, to the old man and that made me feel so good.

JOHN: That's great.

PAUL: So he'd been sitting there for 50 years wondering how those fish got up there. Well, everybody thought that the ice just came along, because it's not only fish, it's fragile invertebrates. A whole benthic ecosystem, and the literature had it, just that the ice hit the bottom.

JOHN: Scraped a few things off.

PAUL: Scraped them up.

JACK: That was our first thing, we said, oh, that's scrapes, and when we cut your ice hole, realized that we'd seen, there was no ice there. We knew the history and there was no scraping or anything going on, and there were these animals in the ice.

PAUL: .. but yours was just a short letter to the editor.

JOHN: I didn't think it was very interesting or very important. I just saw it in the Scientific American article about how they were trapped by ice going all the way to the bottom, and I said that's not necessarily what happened.

PAUL: Again, you guys were on top of things, you were talking and thinking. More so than any time later, I think.

JOHN: Maybe more so than ever since either.

PAUL: Waxing philosophic, would you actually buy into that, for that five year period, maybe, that was some of the most creative work you've ever done?

JOHN: No. I don't know. I've done other things that I feel pretty good about, too.

JACK: Yes, I would not put it as one of my intellectual peaks of my career, but we did a lot of thinking of new things.

JOHN: Yes, we did.

JACK: It was very innovative.

JOHN: One of the things about going to a place like that and being among the first is that there's all these questions that you're thinking about, and you're seeing for the first time.

JACK: I think one of the things was, which was really good, we had nothing to distract us. We were there 24 hours a day.

JOHN: Not trying to do TAs --

JACK: ... and didn't worry about money or food.

JOHN: You knew money was being put in the bank for you. I was secure financially for the rest of my life. I didn't realize that was going to happen, but I almost got thrown off the ice, when I first got down there. I went to New Zealand and took some money out, had it changed from my bank account, Bank of America in the States. I had a small amount of money in there, supposedly all of my checks and everything were going to be put into that bank account. I got down to the ice and the check from New Zealand bounced, and the Bank of America said I didn't have any money in the account. Somehow, Stanford had not put it in there. Next thing I knew, Curly was on my ass, saying, you overdrew, and you better get that money in there. I went back and said, no, you put the money in there because I don't have anything to do with it, you were supposed to put the money in my bank account. He said you take care of that right now or you're going home. He was serious, and it was serious. It was really, kind of up in arms for it, because I left it for that bank account to be filled from my salary, and he wanted to send me home. That was the only, probably the only real issue that I had.

JACK: That must have been very soon after you got there.

JOHN: It was, it was very soon. And the other thing, do you remember I also slipped on the ice once and sprained my ankle really badly? I could hardly walk. That was in the first summer too, and I was hopping around, and they were talking about, you can't be here for the winter.

JACK: Yes, I remember that. Now that you mention it, I more remember you talking about the banana sled when we had the fire watch, everybody always went around, but, once in a while, John Dearborn would drink and he didn't drink at all, basically, not with the rest of us. He used to drink reasonably infrequently, but when he did drink he would get really drunk.

JOHN: He'd get really drunk but he wasn't a drunk, he only drank a little bit. The next day he had no hang over or nothing.

JACK: He was really susceptible and he would almost pass out with a glass of scotch or something.

JOHN: He'd also trash up the furniture.

JACK: He would insist that he had to go on his rounds, fire rounds. So I remember putting him on a banana sled and dragging him around through all the buildings, because he had to make his rounds, okay, we'll make the rounds, and he's passed out on the banana sled, oh, okay, fine. But, dedicated...

[THE END]