

PIONEER DIVERS OF CORDELL BANK

Cordell Bank National Marine Sanctuary
Oral History Project 2009-2012



Dr. Robert Schmieder

Harry Sherman

The Sacto Team: Steve Williamson, John Walton,
Jerry Seawell, Dave Cassotta, and Dave Walls

Bill Kruse and Tom Santilena

Don & Elaine Dvorak and Sue Estey

Edited Transcripts

Interviews by Dewey Livingston
with Jennifer Stock

National Oceanic and Atmospheric Administration
Cordell Bank National Marine Sanctuary
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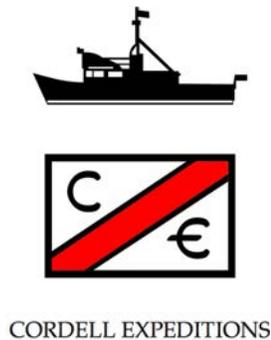
This is a compilation of oral history interviews with core team members of Cordell Expeditions, the team of divers that pioneered exploration of Cordell Bank in the late 1970's and 1980's. These individuals' efforts were instrumental in the discovery of Cordell Bank's biological richness, its nomination and designation as a National Marine Sanctuary. The extraordinary biodiversity of this special place was recognized in 1989, when Congress designated Cordell Bank National Marine Sanctuary. Today sanctuary staff work to protect the Cordell Bank region through research, regulations, and education.

Interviews were conducted with Cordell Expeditions "core team" members (those that were significantly involved in the expedition from the beginning to end).

In addition to these interviews, specimens collected and photos taken during the Cordell Expeditions dives are archived permanently at the California Academy of Sciences in San Francisco. The full audio files are available at the Marin County Public Library and online at the NOAA Voices of the Fisheries Database: <http://www.st.nmfs.noaa.gov/voicesfromthefisheries/>.

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On the web at www.cordellbank.noaa.gov



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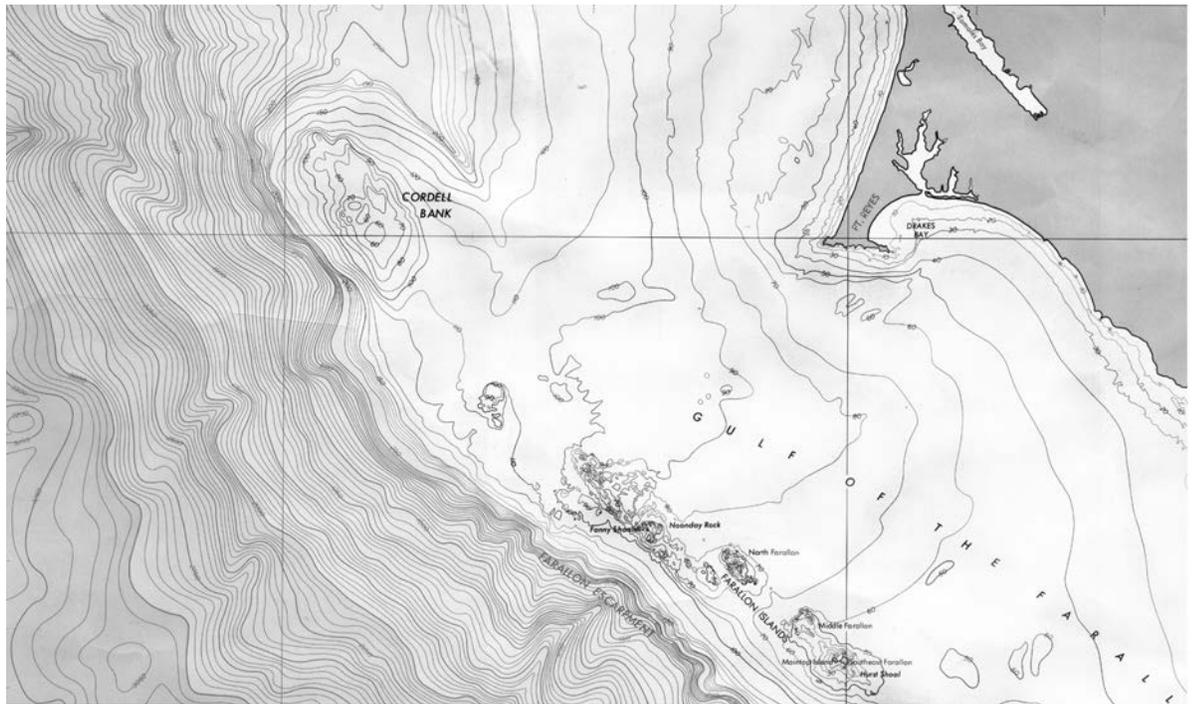
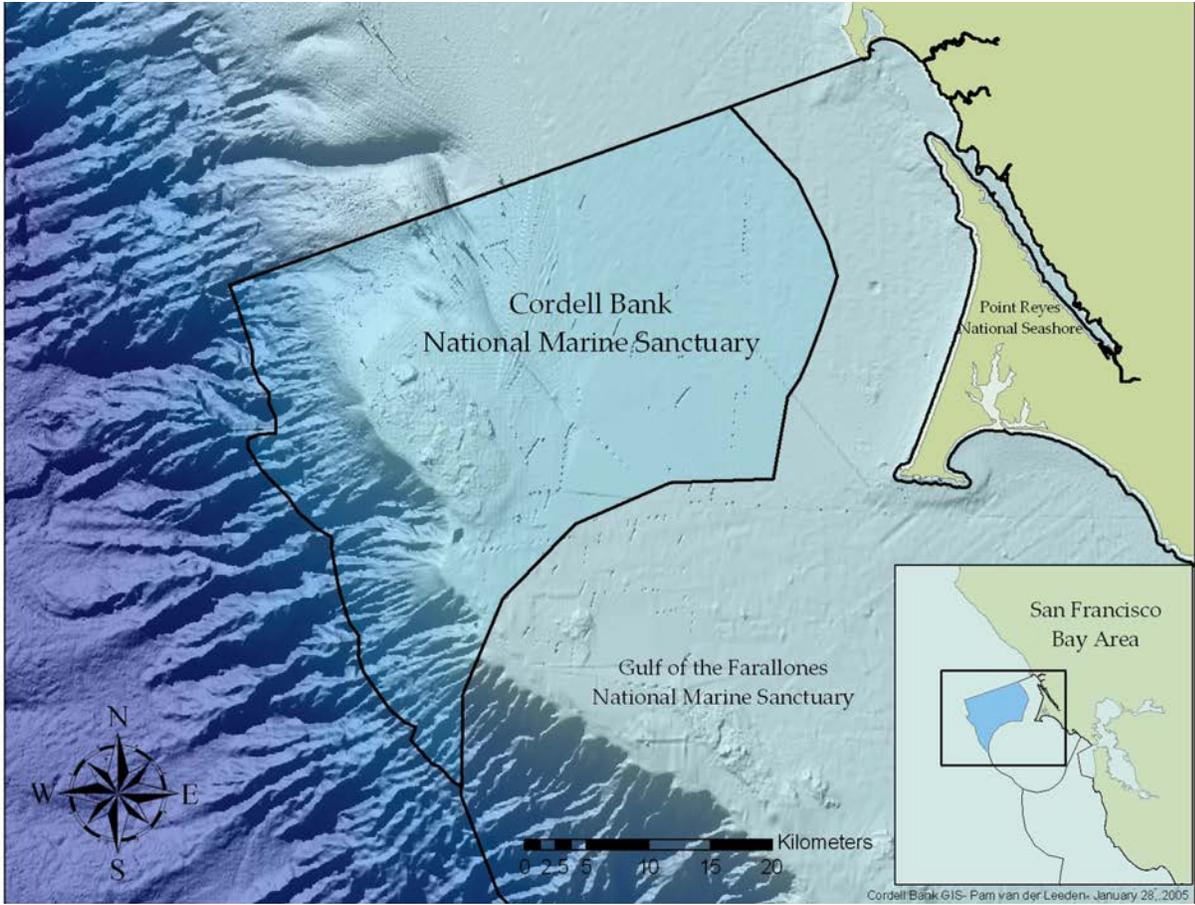


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PIONEER DIVERS OF CORDELL BANK
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Oral history interview with
Dr. Robert Schmieder
June 25 and July 9, 2009



Edited Transcript

Interview by Dewey Livingston
with Jennifer Stock

Interview length: 5 hours, 52 minutes

National Oceanic and Atmospheric Administration
Cordell Bank National Marine Sanctuary
PO Box 159, Olema, CA 94950

Dewey Livingston: It is June 25, 2009. This is an oral history interview with Dr. Robert Schmieder, who goes by Bob. I'm Dewey Livingston, the interviewer, and Jennifer Stock from the Cordell Bank National Marine Sanctuary is here as well; first, would you spell your name?

Bob Schmieder: Well the first name is spelled B-o-b, and the last name Schmieder is S-c-h-m-i-e-d-e-r.

Livingston: All right, and this interview is part of a series undertaken by Cordell Bank National Marine Sanctuary, which is part of the National Oceanic and Atmospheric Administration, NOAA.

00:00:00

Bob, first talk a little about your personal background just briefly, could you please tell about some of your background like your birthplace, date if you're willing, hometown, education even up to that point?

Schmieder: Sure. I was born in Phoenix, Arizona, tenth of July, 1941. My dad was a watchmaker from Germany, came to America as an immigrant through Ellis Island, went to Chicago with his two brothers and sister to settle in America, but my dad contracted tuberculosis so he was sent to Arizona to live in a dry environment. The treatment in those days was just complete bed rest in a hot, dry environment, so he lay on his back in a bed for more than a year, year and a half in a TB sanitarium. When he was able he set up a little watch repair business.

My mother was born in Arizona in a little town called Superior, a mining town, and became a schoolteacher, got a college education and started teaching school. She went to China on a trip and her watch got wet, so she asked her older sister how could she get her watch repaired and her older sister happened to know of a good watch repairman, Otto. So Mom brought her watch to Otto the watch repairman and they agreed to have a swimming date the next day, and within three months they were married. I had an older brother three and a half years older than I, name was Carl after the man who had sponsored my father to come to America, and then I was born in 1941 and we had a sister Linda who was born in 1950 almost ten years after I was born.

So I grew up in Arizona, went to Kenilworth Elementary School, which is on the national record of historical landmark places now, West Phoenix High School and then went away to college and was a visitor in

Arizona ever since. So I went first to Occidental College in Los Angeles. There I got a wonderful, wide, broad general education, general arts, and then I transferred over to Cal Tech in Pasadena not too far away because since I can remember, since early childhood, I wanted to be a physicist and Cal Tech was the number one place that I wanted to go to school. I was able to do that, so I graduated with my bachelor's degrees from both Occidental College and Cal Tech simultaneously the same weekend, a Friday and a Saturday graduation.

That summer I got married and then we moved back to New York City where I went to graduate school at Columbia University and I was there for five and a half years. Two of our three children were born in New York City and after the five and a half years I completed all the requirements for the masters and PhD in physics, and then I set about looking for where I could have a career.

Livingston:

Thank you. Did you have any particular personal interests other than diving when you were younger that might've related to these future experiences that you ended up getting into that we'll talk about?

Schmieder:

I did a lot of activities as kids do but not a lot related to the exploration except that somehow I got a fascination with exploration in general, in the general sense of the term, meaning you go somewhere and it could be a physical where or it could be an intellectual where, but you go somewhere where people have not been before. It sounds a little like Star Trek, a lot like Star Trek, so this was what motivated me about doing physics because we would discover things. So many areas including physical exploration, geographic exploration, are exactly the same experience. You want to discover something. This is fun, it's useful, and it certainly is part of my lifestyle both in my scientific work and in the exploration work.

00:05:00

Livingston:

Could you tell us about your career and then how it might have influenced or helped your experiences with exploring Cordell Bank?

Schmieder:

Well my career started I guess when I finished my PhD in Columbia in physics and I went to the Lawrence Berkeley lab as a post-doc, and I had a very great opportunity to do some work in the field of atomic physics using one of the very large accelerators, the linear heavy ion accelerator. This accelerator had been developed by a man named Al Giorso who

continues to be a personal friend to this day. He's 93 years old. It was used to discover some of the new elements, the transuranic elements, so it was an extraordinarily exciting physical place to be. Al used the north site of the beam lines and I had the south beam lines, and so what I did in those years together with my advisor of course, I was just a post-doc, was we did experiments to produce new kinds of atoms, not new elements, but these are atoms that have lost a lot of their electrons, maybe lost 20 electrons or so, and they have at the time new and interesting atomic physics properties, x-ray, emission properties and so on, so we were exploring that.

Eventually post-docs run out and you have to get a real job. I spent a year as an instructor in the physics department at Berkeley. That was tough. I had the responsibility for a couple of classes and I discovered then that I really would rather do research than teaching because teaching was way too much work, so then I really wanted to stay at Berkeley as a full-time staff member at Berkeley, but there was a hiring freeze at the time so my best option, and it turned out to be a good one, I looked at the Lawrence Livermore Lab and Sandia National Laboratories and I decided to go to Sandia. I got an offer from there and so I did, and I spent 25 years as a research physicist at Sandia National Laboratories.

Livingston: Could you tell us the general point in time that you're talking about when you were in Berkeley?

Schmieder: Yeah. I was in Berkeley from 1969 until 1972, so I had been in graduate school from '63 to '69 – actually late '68 when I finished my thesis. '69 through '72 at Berkeley and from '72 onward up until 1997 at Sandia Labs, 25 years at Sandia.

Livingston: All right, so you were at Sandia when you were out doing these expeditions.

Schmieder: Yes I was, and I can explain how I was able to do this maybe for the first time ever. I'll blow my cover here. We were given at Sandia five weeks of annual vacation in advance. Each fiscal year I suddenly would have five weeks of vacation time that I could spend as I like. I could squirrel it away and use it on weekends here and there or wait until the end and blow it on one big trip, and what I chose to do during all those years was

use it in times when I would schedule expeditions, and it was a sufficiently big chunk of time, five weeks, that by being very parsimonious about it and not spending it on other times I could actually plan and then carry out the expeditions and maintain my secure status as a staff member at the lab.

Livingston:

So while you were working at Sandia or even your Berkeley experiences, were there any inklings in there or experiences you might have had that you could've foreseen that you would've been heading out into the ocean?

Schmieder:

Yes. There were precursors. Well I'll tell you the moment of my epiphany on this. It was in 1953 when the film *Kon-Tiki* came out as a film in the theaters. This was of course you know the raft project by Thor Heyerdahl and five others from Norway and this film was beyond magic to kids like me. I would've been 12 and I can tell you not only I but thousands of other people have had exactly the same experience. They saw that film and their life was completely changed. Mine was, and I knew from that that I would be deeply interested and very excited about doing that. It was such a romantic image and it's so anachronistic as we came into the second half of the 20th century to think of people doing exploration and yet here was an event that occurred.

00:10:50

The ascent of Mt. Everest by Hillary was not nearly as motivating to me partially I think because people climb mountains a lot. You know sort of what the task is. Here Heyerdahl had identified a task, namely to demonstrate the possibility of a migration route for people and therefore the possibility that Oceania could've been populated from South America, not evidence and certainly not certainty, but in a sense this was a much more creative research idea than climbing a mountain, and because of that it appealed to me more because by that time I was already interested in research, whatever the field. In some sense it didn't matter whatever the field just as long as it was research.

So having seen this film in the theater I never again thought that I would do anything else except first of all be a physicist, and secondly be an expeditioner, explorer, but I could make the sequence of getting my education and a job the career of doing physics. I could make that happen. I knew how to do that. I didn't know how to become an explorer so I didn't do much, although now and then I motivated a

project. One of them had to do with trying to photograph the very deepest parts of Lake Tahoe. I developed kind of a theory that animals might have fallen into the lake over the course of time and that their bodies would've migrated to the deepest part so there would be this fabulous collection of bones at least, bodies maybe, and they would be rather localized and all you have to do is go down 1,700-1,800 feet and there they are.

Well in those days there were not submersibles and ROV's and deep water camera cases and so on, so I developed a proposal, a plan, and I was not able to carry it out. In fact I got a little bit of pushback from professionals, which I subsequently found is not so uncommon, but that was a precursor and it was an example of sort of trying to get into an activity involving expeditions. There were some other things. I was always wandering off trying to collect something or find something. I would even make a joke and I still do to this day.

Just this past weekend we got kayaks and we paddled into Emerald Bay at Lake Tahoe, so I remarked as usual, "Well this seems to be the first time this place has been visited by white people", which is of course politically incorrect but historically accurate. That's what people said. Of course there were hundreds of boats around there, but you see my attitude. We are discovering a new place. So there were precursors, yes.

Livingston: Out of curiosity when you were interested in the bottom of Lake Tahoe and what was there, is that during the time you were in Berkeley?

Schmieder: Yeah it was in fact. The idea occurred to me long before that, but by the time I got to Berkeley as a post-doc other than having to deal with raising a family and a house in Walnut Creek, mortgage and so on, I found I had a little bit more time to start thinking about it and so that's when I started trying to do those things. That led around that time, 1971 or so, to getting certified for scuba. Just one day I decided, wow, I actually had a friend who was a scuba diver and he showed me some pictures and I said, "Wow; I can do that and I would like to", so I got certified.

00:15:15 [Introductory statement moved to beginning of transcript]

Livingston: Now to go on, could you tell about your interest in diving? You mentioned just then a little about it, but before the Cordell experiences,

and maybe talk a little about some of the places you dived and activities or projects, something about your diving?

Schmieder:

Sure. I got certified through a local school called Brawley's Regular School and the tradition and what I did was get checked out in Monterey on the beach down there. Literally thousands and thousands of people went through that and continued to go through similar kinds of programs. There was nothing remarkable about it. It was very exciting to me. I was really motivated and into it because it was satisfying my desire to do something different and challenging that not everyone can do. You know it's a lot easier to be successful at something if you don't have so much competition.

What I have tried to do is identify an area that I could go to, area in general, not necessarily a physical area, where the competition thinks that they don't want to go. That makes it easy. So in learning to dive, that was fun for me and motivating and I was able to start learning about some of the things I was seeing, learning the marine biology, the Latin names of many of the organisms, a little bit about their behavior, what they do. For example certain anemones are very aggressive toward others and we learned that, and I had a lot of fun. Probably 20 times a year, 30 times a year I would go with my buddies. We had a small dive group and we sort of dived together. It was all just plain sport diving. We're going to go up to Monastery Beach, we're going to go up the coast to Salt Point.

Although some did, we didn't dive in San Francisco Bay, sort of default, no real reason for it. The visibility is not good, but the places that we did go were fantastically interesting and eventually I started getting familiar with the environment and then asking a different level question. Not only what am I seeing, but what does this all mean? How is this integrated with the larger picture? Has anybody ever been here before? Are we really the first people to see underwater at Monastery Beach? Of course the literal answer to that is no. The answer for me was of course we're not the first, but there probably are places where we could be the first, and if we are the first in doing something like that we are guaranteed to discover something. This was my imperative from childhood.

00:19:33

I would be happiest, maybe only happy, when I am in the process of searching for something, discovering something. So as the two or three or four years passed I found that I was pretty much doing the same kinds of things we had done before, but it was not the same thrill to me to just go get abalone, have an abalone feed and say how wonderful this is. It became not unpleasant, just unsatisfying in a longer term, and that's what eventually led to my personal discovery of Cordell Bank and the whole evolution that resulted in the sanctuary designation, and now this wonderful entity that is the Cordell Bank National Marine Sanctuary.

Livingston: You mentioned diving Salt Point and places in the Monterey area. Did you dive farther a field, up the coast, down the coast, outside of the state?

Schmieder: No, not really. I kind of deliberately did not go off to the standard world class dive places, Red Sea, Cancun, Palau, and so on. Hawaii is not a good place to dive because it's in the doldrums in the Pacific, but I did not partially because I was spending my vacation doing other things and I had a family situation that didn't allow me to just get up and go on trips like that. So I was confined to the coast, and actually I now in retrospect prefer that because the cold water, the water along the California coast in common with some other places in the world is cold and moves a lot, and so it supports this fantastic invertebrate community, and because of that the higher trophic levels. That's what I found interesting and eventually I became really stuck on the invertebrates and the algae and central California coast. Northern California coast was where we founded and where I stayed.

Livingston: When did you first hear about the Cordell Bank and what did you learn in those first hearings?

Schmieder: Well I remember this so clearly. This process that I just described where I kind of evolved in my diving, I was starting to say is this all there is to diving, namely sport diving, and for many people yes, that's all there is. That's what they want to do. It was not for me. So by that time for about a year, this was in 1977 around that time, I was starting to get a little itchy, looking beyond the sport diving picture and saying, "Is there a project? Could I collect some data for somebody? Could I make a chart or a map or something for somebody? Can I do something that's useful and worthwhile?" Because my day job is as a scientist, this is the

process I know. You go somewhere, you observe something, you document it, you preserve it, you write about it, you share it with people and you carry on with that kind of intellectual metabolism, so I was really ready. The event that triggered me was a couple of articles written by a reporter for the *Oakland Tribune*. Fred Garretson, we called him Skip, he was the science reporter and he was a very good one, so he published a series of semi-expose articles about the radioactive wastes that had been dumped in the ocean near the Farallon Islands, and it led to quite a stink if you like, a public response and eventually governmental response with submersibles to go out and find these drums of waste, and there were inflammatory reports about giant sponges growing on warm drums containing radioactive materials.

00:24:17

I knew that was all nonsense because I had worked not only at Berkeley where most of the material had come from but also at Livermore, and there's a lot of radioactivity and as a physicist I worked with radioactivity and radio chemistry, so I knew that these were not really dangerous materials and yet there it was. So voila, there is a project. Could I go out as a physicist and a diver? I had the right combination of preparation. Could I as a physicist and a diver go out and shall we say examine these things, document them in some way, collect some data? Then I would be able to make measurements. I knew about instrumentation. I knew about radiation counters. I know about the activity. We could take data, we could analyze it, we could find out if this is a problem or not and that would be a useful thing for me to do. It was a nice project.

That's where I was when I opened the chart to find out exactly where these wastes had been dumped off of the Farallon Islands in three or so places, and completely by shall we say a prepared accident, there were some contours to the northwest with the name of Cordell Bank, one contour of which was a small circle about a quarter of an inch in diameter containing the number 20. So I learned that that meant 20 fathoms or 120 feet was a sounding there, and that clicked because even though I had not yet ever dived to 120 feet I knew that in principle one could make at least one-way trips with scuba to 120 feet and we could maybe even return alive. My attention just shifted. I kind of abandoned Skip Garretson and the *Tribune* and the radioactive waste and I got interested in just asking the generic question, what is Cordell Bank? There must be a lot of knowledge of Cordell Bank at the Cal Academy

and I was of course familiar with the academy and even knew some of the staff.

So I started asking questions. The generic question was, “What do you know about Cordell Bank?” and the inevitable answer was either, “Well, um, I don’t know, I use Wells Fargo myself;” or if they were a little more savvy they would say, “Yeah, it’s this place out there. Nobody knows anything about it. There’s no specimens from out there. We don’t know anything about it,” which was inflammatory to me of course. When I heard comments like, “We don’t know anything about it,” that was exactly what I was looking for. So the question was, could I turn that kind of a trigger into some kind of a project? The rest we’ll elaborate as we talk some more, but that was how it was triggered.

Livingston: So you’ve explained some of our next questions then. At this point then did you immediately have some goals with the idea of exploring the bank?

Schmieder: Sure. The reflexive goal was “what’s there?” Actually before that was, “what is already known about Cordell Bank?” For a couple of months I went on an odyssey to learn what was known about Cordell Bank. In fact the very first information I got other than “We don’t know anything about it” was at the Marin Civic Center in their library, and they had a copy of the *Coast Pilot*. *Coast Pilot* is the handbook for navigating waterways up and down the coast and in waterways. This particular volume of the *Coast Pilot* was written by George Davidson who had been on the west coast since about 1850 and had authored this *Pilot* in the 1850s as multiple successive volumes, and by now they’re considered historically valuable, but they’ve been revised, updated, and abridged so that now you can get a *Coast Pilot*, but it’s very utilitarian. In those days in the early volumes it had a lot of descriptive material.

So there I was in the library at the Marin Civic Center and I opened this book and it told me a lot of things about Cordell Bank, roughly where it is, roughly what size it is, and who discovered it: Edward Cordell in 1869. Of course that was like a bolt of lightning. The flash in learning something like that was not only a shocking thrill, but it implied that there was a lot more to be learned because this had been important enough. It was not a neglected thing. It was something that had somebody’s attention, serious attention, long ago albeit, but somebody

really cared about this place and therefore from that moment on I really cared about it.

00:30:05

From that point, that beginning, I then tracked around and started learning lots more about Cordell Bank, but I was only able to go so far with that until I came to the clear realization I would never get satisfaction on how much I wanted to know about Cordell Bank because nobody knew enough about it to satisfy me, and therefore sort of not on one particular moment but sort of emerging in that time was this concept not only must we go to Cordell Bank and find out what's there, but we probably can, but it won't be easy. So then I had a project and I can tell you I was very happy. Sure enough I had a project.

Livingston:

So please describe in as much detail as you're comfortable with the early planning of this first expedition including your initial research, which you've touched on already, organization of the expedition, any bureaucracy you might have had to deal with, funding, that type of aspect.

Schmieder:

Yeah, well this actually gives me a chance to put into this record some of the events that happened that I've never had the time/space before to relate, so this is a nice opportunity and I will at this point. I had the idea to go to Cordell Bank, explore it in the old-fashioned traditional sense that Thor Heyerdahl had the idea to do his Kon-Tiki raft trip on the Pacific in the old-fashioned shall we say anachronistic image of an explorer. I could do that because I had a day job as a physicist and I could do this. I could engineer this anyway I liked. That's the way I like to do it in the mold of Heyerdahl.

So my first step after realizing this was to get together with my closest buddy in our small dive group, a bunch of buddies that went sport diving. His name is John Hall. John was more experienced as a scuba diver than I was, so I went to John and I said, "I'd like to go to Cordell Bank. Can you help me figure out how to do it?" in almost those words. So we spent some days examining the project in detail and I learned a lot from John. I'm going to give John credit for some of the ideas, the actual origin of these ideas, and I'll tell you what they are, but of course I not only grabbed these ideas, but like an amoeba I just incorporated them into my DNA and from then on that was the way the project was in those aspects.

So what John and I talked about was how could we go to this 20-fathom mark in the ocean and dive 120 feet and get back alive? The first thing John said was, “First of all you don’t want any beginner divers. You only want people who are experienced and you’re going to have to do a lot of practice for this. This is not a dive like we have been doing in our sport diving group where we go to Salt Point for a day and get abalone. This is going to be different.” I think I already understood that, so we were in agreement on that.

Another thing he said was the equipment is going to be pretty critical because the depths, 120 feet is beyond the normal sport diving range, therefore we should do the following. The ideas were mostly from John, some from me, but together we came up with things like each diver should do only one dive in a day. We should require a decompression stop regardless. We should design the dives according to the U.S. Navy tables. Each diver should have twin 72 cubic foot tanks or larger. Each diver should have an octopus regulator. Exactly who announced those words first or second almost doesn’t matter. We were jiggling each other and producing these. A lot of those words came from John’s mouth first, but had he not said them I probably would have as well, so that was a joint creative effort.

00:35:14

As you can tell, those features persisted all the way through the entire program that we did. Those happened within a day or two. So after two or three days of brainstorming with John Hall I felt that I knew enough about the mechanics to project what would be necessary to do an expedition to Cordell Bank and get back not only alive but with specimens and we hoped photographs and so on. I forgot to mention by that time I had interacted with staff at the Cal Academy and they disclaimed having any specimens from Cordell Bank with the one exception of a bag of greenish kind of mud, which G. Dallas Hanna had dredged off the coast in the 40’s I believe. The mud was dried and it turned out to be 100 percent foraminefera so it’s a bio sediment, and I was able to examine that, but that was the entire extent of the holdings at the Cal Academy.

The Cal Academy would have been the expected place of record to house specimens and information about Cordell Bank, so having gone through the academy, searched through the academy and found

essentially nothing, I knew that we had a valid project. We would not go to a lot of work, come back, and they would say, “Well you could’ve just gone into that room and found it all.” We knew that was not the case.

So back to the preparations, after John and I talked it over I codified it into a plan and the next step I did was I went to a meeting of the Sierra Club Loma Prieta dive section. I was an active member of the Sierra Club. The Loma Prieta chapter had an active dive section so they would go out on sport dives on a regular basis and it was quite a large group of people. They would have monthly meetings. Maybe there were 20-30 people in those meetings and I had been to some, but I didn’t go on a regular basis.

Once I had the plan I requested a moment to go to this meeting and announce these plans and solicit divers, so I did. I made a little speech. I showed a map of where Cordell Bank is. I said the target here is 20-fathom mark and judging by the diameter of the circle on this chart it’s going to be a quarter of a mile in diameter within the shallower than 20 fathoms. Of course I was stupidly ignorant because 20 fathoms means that there was one place noted at 20 fathoms and it’s somewhere within that circle of a quarter mile in diameter, but blissfully and on so many adventures this way, ignorance was a useful tool to me at the time because had I known how tiny that place was and the other places that we subsequently discovered and dived on and documented, I might have said this is going to be too difficult and not rewarding enough.

120 feet down and it’s 20 feet across? Are you kidding? 20 miles out? So I benefited, we benefited from the requisite level of ignorance in starting the project, so from that I picked up a few people who were interested, one in particular Don Dvorak became not only a lifelong participant in the project but a lifelong close, close personal friend and has remained so to this day. From that meeting there were enough people who heard about this project and it was interesting enough that word of mouth was enough to get people flooding me at home with phone calls. “I hear you’re going to Cordell Bank. I’m a diver. I’d like to go with you. Which day are you going?”

I had to explain that this was going to be a project. It’s not a sport dive. It’s a scientific dive. We are not going there to see beautiful things. In

fact the predictions, which I know to be wrong, but I wasn't sure how they would be wrong, the predictions were that it would be a pretty boring dive. It's too deep and too dark. In other words I was discouraging people who would call because I knew that most of them were enthusiastic sport divers and that's not what I needed. I needed a patiently prepared and willing to prepare extensively scientifically oriented diver.

Within a couple of months I had quite a list of people and so I contacted a staff member at the Geological Survey in Menlo Park, and he was kind enough to make available one of their meeting rooms in the Survey in Menlo Park, and so I called a meeting as of a certain date, and 40 people including myself showed up. So by that time I had elaborated and focused the plans and the potential problems for doing this. I had been sort of catching wording that I would use, "This is an expedition, this is not a sport dive" and so on, and I basically presented it. I also invited Paul Silva at Berkeley to come and talk about algae. He is one of the world's experts on algae especially on the California coast. He came and talked about what we might find in the way of algae.

A geologist came and talked about what the rocks might be and would we be able to bring back samples of the rocks and who would care. He pointed out that Cordell Bank is part of the Salinian block documenting with samples, Salinia would be useful to the geologists. We had a person who was a bird mammal observer who talked about the birds and mammals that had been observed. There was a Marin County group that had been out to Cordell Bank and had seen whales and migrating birds.

00:42:28

So I provided the scientific motivation through these other experts. They didn't have to take my word for it. At the end of that meeting I said, "Okay, let's take a break and talk about it" and then I called people back together and said, "Who wants to do this?" and everybody raised their hand, so I said, "We need a treasury. We need a funding here, so everybody write out a check for \$40.00" and everybody did. So we had \$40 times 40 or \$1,600.00, actually minus one person. One person decided he didn't want to do it so it was 39 times \$40, \$1,560.00 as a war chest. Foolishly I thought that was enough money and I think we projected to prepare for about two months and then we would do our dives. That meeting was in the summer and we would do our dives in

late September, October, which by that time I knew was the right time of the year to do it.

We thought we could do it between July and September to prepare for the first dive at Cordell Bank, and that along with so many other things proved to be wrong. I can follow this on with the details of what took us more than a year to prepare for the first dive.

Livingston: To follow up on a couple of things to make it clear, the 40 people that you're talking about expressing interest, were each one of them interested in the actual dive or is this in helping put together the expedition?

Schmieder: These were all divers and I think by and large they were all sport divers, but I think they were motivated by the same thing I was motivated. They were sort of through their sport diving experience and looking for a project and that's why they came.

Livingston: Could you name the Marin County group that you mentioned? Do you recall?

Schmieder: No. There was a small book written about Marin County birds and it was part of a larger group. The Audubon Society carries out their New Years Day counts and I talked with a physician whose name slipped my mind at this moment, but he gave me a copy of his book and told me that there had been birders going out from Bodega Bay to document the birds, so that's when I learned about Bodega Bay as being the port or portal to get to Cordell Bank.

00:45:26

Livingston: Okay, and then stepping even farther back you said you codified it into a plan. Physically what did that plan look like? Was it a page or two of planning or how extensive was it?

Schmieder: Yeah. It was not what I came later to write much more extensive documents that look a lot like a business plan. They have background and means and budgets and so on, but it was probably as I recall five or six pages including the charts, where Cordell Bank is, what we expect to be there, and sort of what the project would be like. It was basically a handout description, summary of the project. It was sufficient at the time, subsequently in the other expeditions that I've done that are much

more complicated such a small start would be way inadequate, and I've started those expeditions with 100-200 page plans.

Livingston: Could you go on then where we left off? Now you had the group. You had some money.

Schmieder: Well the next step was to actually see if we were able, capable of doing the dives at Cordell Bank. The very first step for me was making sure that I didn't have any people who thought they wanted to dive at Cordell Bank but were not up to it. Safety was then and has remained the number one controlling aspect of what we do and eventually, I'm very proud that we had a 100 percent perfect safety record. That started at the beginning.

The very first activity we did was we wanted to get used to twin 72 tanks with octopus regulators, which none of us had dived with before, so we talked Marine World Africa U.S.A., which was in Redwood City at the time, into letting us dive in their big shark tank, and so we carried our new gear. There were a half-dozen of us including Don Dvorak and we also had an underwater communicator, a person who had engineered, developed, and had prototypes of essentially an underwater radio, and it was a radio. It operated with electromagnetic radiation under water, very low frequency so it would propagate at least a few hundred feet.

So we strapped our scuba gear on and these underwater radios and swam around in the tank while people gawked at us through the window and we talked to each other. We came away from that feeling that oh, we were very scientific, we had a lot of technology, we were really getting ready to go on an extraordinary expedition adventure. Following that we decided to start practice dives. It was part of the procedure that John and I and after John was not really involved, he actually didn't participate after the actual planning, John Hall.

We decided to go down to Monterey and carry out some practice dives, full gear, twin 72 tanks or bigger, octopus regulator and so on to get familiar with each other and to get familiar with the procedures, and so we did, and it was on those practice dives I was able to filter the people who had come to the meeting at the Geological Survey, the 40 of them. Some of them as I expected were really not up to that. They couldn't handle the big tanks. It was too big of a project. People started calling it

a mega project because other projects that sport divers knew about had to do with maybe taking films of a certain nudibranchs or something like that, but this clearly was going to become a big task. As people realized that they decided that they weren't really ready for that and they just drifted away.

00:50:00

Those that didn't drift away early on, many of them drifted away later off so that as time went on I had fewer and fewer people, so by the time we eventually got to a year later and could carry out the first dive I had only one person from that original group of 40 and that person was me. The attrition was so great. It was quite a lesson in how to start a project and how to take the next step, but by that time I had picked up two or three other people and I felt comfortable about their diving ability and my own ability. I was a very strong and very skillful diver so I didn't doubt my own ability, and then the other people that I started interacting with and were very energetic and were expedition people in the sense that they would contribute to the planning and the preparation and brainstorming and all that stuff, so it became the project that I wanted it to be but not with the original 40.

Livingston:

Was there an ideal number or a minimum number that you felt was needed to be able to carry it out?

Schmieder:

There was a threshold that I would not go below to actually carry out a dive at Cordell Bank and that was five. The reason for that was that the absolute minimum dive team is two people, and I wanted to have two teams so that we could have one team and then another team plus one diver who would be fully suited up as an emergency diver but not be in the water so he would not be cold, he would not be burdened with the need to decompress and so on. He could get into the water and go rescue somebody who was drifting away in the current or something like that. Five was my number. I would not go to Cordell Bank without five or more.

As I approached the first dive I found I had four, and so I was very pessimistic. I had a boat by that time and I can explain how I got that, hired it, but luckily the night before we went to Cordell Bank and actually carried out the first dive, October 20, 1978, I picked up the fifth diver and he was clearly qualified so we went out and did it.

Livingston: Was there any regulatory entity that you had to deal with, obtaining permission for instance?

Schmieder: Apparently not. I don't remember being as energetic as I would be now to ask permission, but I guess I tacitly assumed that if there was some kind of regulation somebody would let me know, because by that time we had pretty much blown our cover. We were going to Cordell Bank and we had even had publicity about it, a newspaper article, which I can tell you about, before we ever dived. So I didn't run into anyone who said, "You need a permit" or "You need to talk to some official about it." It never occurred to us that we would need such things. Nowadays things are different of course.

Livingston: You obviously were spending more than \$1,600.00 by this point.

Schmieder: *[Laughs]* Well the budget went down because we spent money on necessary things. I had to reserve some money for the boat that would take us out to Cordell Bank, but I found that we needed more money than that. Actually it's a little tough to remember exactly what it was we spent the money on. I think I felt it was right for us to buy film for the photographers' cameras. I had to buy tapes to do debriefing audio recordings. Those were legitimate expedition expenses and so we kind of dribbled away the budget. By the time we actually carried out the first dive there was no budget left.

Essentially I was supporting it just with my checkbook and getting on with it, but it wasn't too burdensome. By that time the number of people and the scope of it had narrowed considerably. We didn't have the big plans we talked about at that 40-person meeting in July of '77. We just wanted to get to Cordell Bank, dive, and get back, because I knew the threshold for the project was one success no matter how small, non-zero success. So we kind of just winged the budget for a while.

00:55:25

Livingston: I take it that you bought your own gear. The members of the expedition bought their own gear. Things like that weren't being provided by –

Schmieder: That's correct. Everybody had to get their own twin 72 tanks and it was kind of tough. The tanks in those days were strapped together with some shaped metal bands. Those were hard to find. The regulators, an octopus regulator just means a second regulator and we required that in

case somebody failed, that two people could breathe off of the same tanks. That hardware was already there so all we had to do was buy the gear, but it was everybody's personal expense including myself.

Livingston:

If you could describe a little more of the planning dealing with safety.

Schmieder:

As I mentioned safety was number one on our to-do list in the sense that it was a requirement with me that we would do the sanity check. We were not doing this for adventure. People jump out of airplanes for adventure. This is not that. This was a project to go and collect information about a place, so it's an expedition. We joked that it would've been a lot easier if there hadn't been so much water around, we could just walk out there and collect things, but we spent a lot of our energy, a lot of time talking about how we could do this, reducing the risk of injury or death below a level where we could carry out an extended research program and feel reasonably confident that we would not have an incident, send somebody to the hospital or to his death.

So we divided that requirement sort of into two things. One was the equipment and one was the procedures. John Hall and I, John in particular had enunciated at the outset, which I talked about earlier, twin 72 tanks, octopus regulator and so on, and those became the standard inventory of required gear. The procedures were more tricky and we debated those more and in some cases I had to simply define it. I had to override people's adamant statements that "I do it this way." I would override it with something like, "You can do it that way, but we're going to do it this way on Cordell Bank."

Here are some of the examples of the procedures. We decided early on to have only one dive per person each day. You could not do a repetitive dive. That dive had to be designed according to the U.S. Navy tables, which provided decompression schedules, so depending on our bottom time and we could project that, we knew what it was going to be nominally to 150 feet, a bottom time of 15 minutes, which means from the time you leave the surface to the time you leave the bottom. The bottom time for that is 15 minutes and you pay for that with a three-minute decompression stop at 10 feet. All of this you read directly off of the U.S. Navy tables.

Remember there were no dive meters, dive computers at the time. In fact I dived with a man named Bob Hollis who invented the very first dive computer and on the bottom at Cordell Bank he showed me the very first dive computer in the world, which was an astonishing surprise to me, but as we were planning this there were no dive computers and so here was a procedure that I defined and required. We would have a team of three people. One would be a collector of specimens, one would be a photographer of the collecting of the specimens, and one would be a safety diver who would have no other responsibility than to watch the first two.

01:00:00

Team of three is normally a no-no for sport diving because of the danger of three people drifting apart. Two buddies keep track of each other, three is too complicated, but you see the motivation for having three, but then by defining one of those three as the safety diver, that's how I felt that we could assure that we could do a team of three and it would be much more efficient that way. We would get specimens, photographs, and get back alive.

The other parts of the plan involved requiring that decompression stop three minutes or more. You could spend as much time as you want hanging out at 10 feet, so that motivated us and we did produce some hardware. We called it a T-bar. That's common. You hang a pipe 10 feet long down in the water with a T on the end of it and so when the diver comes up he can hang on this. It's supported by an inflatable boat on the surface. He can hang on this bar and make himself negative buoyancy so he's hanging down. There he is at 10 feet. He can hang there as long as he wants while he does his decompression. When he comes back he comes to the surface and indicates he's to be recovered and if all goes well there's a diver suited up in the inflatable right there to take his camera or the specimen bag from him and then to assist him getting his tanks off in the boat and then get the diver into the boat, and that's exactly how we carried it out during almost all of the process.

You can see that for a group that had not operated like this before we had to define this, then we had to convince everybody that they were going to agree to do this, and then in the field what I found was essentially everybody did this. I didn't find people violating the rules because by then we knew that the stakes were very high. The dangers were high enough that we all did it right.

Livingston: You had mentioned doing practice dives at Marine World. Did you do practice dives in the ocean as well?

Schmieder: Yeah. In fact we only did that one dive in the tank at Marine World and that was sort of easy and fun and getting involved with people. We did almost all of our practice dives at or near Monastery Beach on Monterey. The reason was there's a place there you can park along the road in the neighborhood, I know the neighbors didn't like it. Walk down to the beach, and within 100 feet you can be down 150 feet in depth, and it was relatively safe, there were always lots of people there so if there were an accident, rescue would be near.

There was a decompression chamber in Monterey, still is, so we had a lot of emergency response capability should something terrible go wrong. In fact nothing ever did go wrong except many of the divers who thought they wanted to dive 250 feet really didn't. If they came out saying, "Oh my god, that was terrible," then I didn't take them to Cordell Bank.

Livingston: Today we have detailed documentation of the underwater topography and in your early planning you mentioned that the map turned out to not be exactly what you needed. What was that map and was there any other information you could use?

Schmieder: There was only that chart and it was the standard public chart published by NOAA, has a standard number on it and there are charts of all of the U.S. waters. At the time that was the best and the only chart available to us. That was the chart that I saw when I made my personal discovery of Cordell Bank and the piece on that chart was this circle about a quarter of an inch in diameter with the mark 20 fathoms on it. I've said that this was a useful ignorance for us because we had no idea how misleading that chart really was.

It was published according to the procedures. Even now they would put the same kind of marks on the chart, but in those days there were not the high-resolution survey data we have now with the control of meters. That's all we had and we thought we were aiming for a very big target. This was going to be Disneyland for us. We could wander around as divers. We worked under that assumption in developing our plans, the

safety plans and so on, and it wasn't until deep in the preparation process that I started to realize what that really meant, and it was with some horror I must say that there was less understanding and there was now belief that 20 fathoms inside of a quarter-inch diameter circle did not mean there was a quarter mile of shallow water there. Who knows what it was?

01:05:42

Of course as we subsequently know it turned out to be, shall we say, miniscule. It drove our planning and as we started to realize how to really interpret that chart, we had to become more serious about how to find such a place and how to establish a descent line to do our diving and it was quite different from the initial concept of just going out and plopping in the middle of this big place.

Livingston:

Was that something you had to do out on the boat or could you plan for that before you went?

Schmieder:

It was the latter. As I came to understand how to interpret the chart, what the chart really meant, I essentially changed how our preparations were going, and we started paying attention to how would we find this place, how would we establish a line on such a tiny place as far as to brainstorm and think about what would we do if we couldn't find the place, the place meaning not a huge place but now a tiny place. By the time we actually started going out to Cordell Bank we had that plan in place, and with practice, a year or so of practicing we got pretty good at it. By 2006 when I went with Jean-Michel Cousteau and his team on the dive for the sanctuary programs, I was able to establish the line probably within 15 feet of what I was aiming for, so we got pretty good at it.

Livingston:

Did you plan to do any specimen collection on the first dive? I know you mentioned the people interested in geology, etc. In this planning session how did you plan for collections?

Schmieder:

If we had not planned and implemented a way to bring back specimens and/or photographs it would've been a sport dive. It would've been anecdotal science. We would've come back and said, "Wow, that was really gorgeous, wasn't it?" but it would've meant nothing. It would've not been an expedition. It would've been an outing. So collecting specimens was the critical action that we had to accomplish from the outset. Taking photos was also there, but I was really not an underwater

photographer. I never got motivated about it. I formed friendships with underwater photographers who were very enthusiastic, but before we saw it for the very first time we didn't really know how photogenic it would be.

Now even in those days I didn't have any concept, any desire to go and take pretty photographs. That's not what we were doing. I didn't care whether they were pretty or not, so to me it wouldn't matter what the photos were, but to the team, especially the photographers, they were interested in subject matter. I was interested in content. These are slightly different. Well maybe I should say appearance. They wanted to come back with wonderful photographs. I wanted to come back with wonderful documents that showed details. This is the difference between a field practitioner using tools that he knows to get things that he wants, which is well-composed, beautiful photographs, and myself, which was to get data. I understand data. That's what my life is about is data.

So from the outset it would've been useless for us to go out there without collecting either or both photographs or specimens. As it happened on the very first dive we didn't have a camera, so we took no photographs, but we did get specimens.

01:10:00

Livingston:

What kind of preparation did it take in order to collect the specimens?

Schmieder:

Oh my gosh. What an adventure that was! We brainstormed on what kind of collecting apparatus we should develop. We figured that we were so smart we could invent something really effective, really efficient, and therefore probably a little bit complicated, and we designed it and we actually built stuff. These had plastic bags and they had hinges and they had clips and clasps and tags and signs and invertible pockets and all kinds of stuff. We actually built a bunch of these things and went down to McAbee Beach and other places in Monterey and took these out into the water. By and large the things either disintegrated or tangled into a Gordian mess.

We came out saying, "Well, that thing doesn't work. Let's do something else." We also got involved with a lot of other technology that we thought we could handle as we were planning this. One was these underwater communicators. So we spent some time with the

inventor of these underwater radios doing distance tests and we could go 120 feet away and still hear them and so on because we thought that it would be really valuable for us at Cordell Bank to be able to talk to each other. We could say, “Gee whiz, look at that” or something technical of that nature.

Ultimately those proved to be unworkable because we had to trail a 20-foot antenna around in the water with us and we would get tangled up in that. Another piece of technology was a big time lapse camera, 16 mm built into three huge watertight steel containers with a gigantic A frame about the size of a child’s swing. We actually went out on a barge in Monterey and deployed this thing on the ground in the water at about 30 feet depth. It ran 24 hours taking one photograph every minute, so we came back with 16 mm footage that showed nudibranchs waltzing across the field of view and an octopus flashing in and out and algae waving around and it was really wonderful, but then I realized are we gonna carry this stuff to Cordell Bank and deploy this at 120, 150 foot depth?

The fellow who developed this was pretty much of a walking disaster by that time. He was brilliant, but he was clumsy in both his actions and his plans, and there came a point where I said, “Sorry. We can’t use this. We are not prepared to use this.” The same was true of those fancy collecting bags, so what we ultimately fell back on was the standard diver’s canvas goody bag and a garden trowel and that’s what we used forever, nothing more complicated than that.

Livingston:

On this subject let’s close it out by asking if there’s anything you think could be addressed in this subject. We’re just about to get to the first dive. Is there anything that we might be leaving out?

Schmieder:

Would you like to know how I found the first boat that would take us out to Cordell Bank? ‘Cause this was part of the planning. I went up to Bodega Bay after I learned about Bodega Bay. I found out that fishing boats went out to Bodega Bay on any days they had clients and weather permitting, and they would go out to Cordell Bank. They called it Cordell Banks. In fact even today most people call it Cordell Banks, which is colloquial. I consider it slang and I can’t tell you how many people I have helped to understand that we say Cordell Bank, but I found several people up at Bodega Bay who said they’d take us out to

the banks and sure they knew their way around and they'd take our divers and we were fine.

It was only one, Mike Craine who had a very tiny fishing boat called the *Mariner*, little black boat, and he went out once in a while outside. I think he had been to Cordell Bank once before, but he kind of cleverly and usefully hid that from me. So he and I stood on his boat in the harbor there in Bodega Bay and talked about the project and he agreed to do it and we agreed on price. I think it as \$275.00 to take us all the way out to Cordell Bank and back with my team of what I thought at the time was 15 divers or so, lunch included.

01:15:15

So as time went on, as our plans sort of lurched forward and downward, Mike Craine was the constant in that. The boat was available, and in fact when we finally succeeded almost a year later it was on *The Mariner* with Mike Craine at the wheel to take us on our very first dive. He and I went out on the boat six weeks earlier on a survey cruise to see if we could find that 20-fathom place, by which time I was alerted and understood that it may take some searching. So Mike and I and his wife went out just the three of us and we searched for many, many hours, a lot of frustration, couldn't find the 20-fathom mark, and I began to think, "Oh my god, what hath I wrought?" His wife blew Mike's cover by saying, "Dear, you were able to find it the other time you were here on the bank" and I kept quiet because I thought, wait a minute, he said he knew Cordell Bank like the back of his hand, been here many times.

It was okay. Eventually about 4:00 in the afternoon we found the 20-fathom mark and I threw out a small anchor with a thin piece of fishing line and a capped empty bleach bottle as a float thinking we found it. When we come back to dive we know exactly where to come, and I went back to my team and said, "It's marked. We know exactly where to go," not knowing how foolish, how stupid that was ultimately. When we talk about the first dive we made I'll elaborate on why that was so silly, but that's how I got to Cordell Bank the very first time and then eventually six weeks later with Mike on our first dive.

Livingston:

One more thing before we break. Did you know of any other expeditions in the United States on the coasts, even in the world, that you could compare notes with around the time you were doing it or in the not too distant past?

Schmieder:

No I didn't, and that's primarily because I didn't look. First of all I was pretty busy figuring out our own project. Secondly I really didn't need anybody else, although in retrospect that seems very arrogant. Nowadays I wouldn't be nearly as arrogant to think that I could invent the whole thing myself. I knew of some projects and in fact there was a kelp forest monitoring program on the Channel Islands and I participated in that. I went down and dived with them and did the kind of volunteer work that I fancied we were going to do with Cordell Bank. The difference compared to that project was that project was a systematic long-term study and I knew at Cordell Bank this was going to be opportunistic. We would not have the ability to come back to the same place on anything like a schedule.

We may see many places only once, forever, so this was going to be an opportunistic grab-sample kind of expedition and because of that the control would not be take samples or at even intervals or at even times or controls like that, but it would be how much diversity would we be able to go for. This is counter to the goal of many expeditions, maybe most, or projects that on the surface may seem similar like that kelp monitoring project. Cordell Bank was not going to be that way. It was going to be in a sense jump in, mixing verbs here, jump in, grab what you can grab and get out, sort of like that supermarket game. You run in and you've got five minutes to grab whatever you can grab and then you get out.

That's what we were going to do. I didn't need anybody's model, and in fact I found myself in conflict with professional scientists who advised me that I'm going about this the wrong way and that I need to lay out transect lines and take samples at even intervals and they simply didn't understand the difficulty of what we were about to do. I did, so that's how I went ahead and designed it without anybody's help, with my team of course.

[01:20:18, end of audio file 1. Begin audio file "CBNMS Schmieder 2" at 00:00:00]

Livingston:

This is the beginning of the afternoon segment, interviewing Bob Schmieder. We're going to be talking about the first dive in October 1978.

First of all, could you name the people who were on that first dive?

Schmieder:

Yes, I could name them. They were myself, there was Steve Lawler, there was Larry Pfoutz, there was Dannie Baxter, who is a woman....

Well, so as the project progressed – we had to go through the winter of 1977 and then the spring. And we started doing practice dives in preparation for actually going to Cordell Bank.

One of the practice dives we did was out to the Farallon Islands. And we took the assistant to Paul Silva who's the algologist at the herbarium in Berkeley. Dick Moe, Richard Moe, was just finishing, or had finished his PhD in algology. So he went with us on a practice dive out to the Farallones. And we dived to 150 feet, about a mile to the east of the southeast Farallon in a dive that I probably would not do today because we had no knowledge of the Great White Shark population out there.

And this was in August or September just about the time when the sharks, as we now know, are returning to the island to feed on the elephant seal pups.

But in that dive not only did we carry out tests of the equipment and under field conditions, that is, not practice dives at Monterey anymore, but actually out in the ocean to the right depth with the right decompression schedule and so on. But we succeeded in collecting a bag of specimens and all the algae went with Dick Moe to Berkeley to the Herbarium.

And I subsequently learned that this was the first collection of subtitle algae ever done at the Farallones. So that gave us a jolt, a scientific inspirational motivational jolt that we not only could do field science, but we were doing it.

And that really spurred us on. And I got very much more energetic and enthusiastic and confident that we could do this. By that time the team had dwindled to Don Dvorak, who had started at the beginning, Steve Lawler who'd become a central team member and a shall we say strategist in this, Dannie Baxter, a woman from Marin County who was a sport diver and a photographer – underwater photographer, Larry Pfoutz who had been a friend of Don Dvorak, tall lanky, strong diver.

And so we had about four people at that point, but my minimum was five and so we went through for a month or so with not enough people, and I was feeling very impoverished, even despairing, that we may not actually go to Cordell Bank and go diving.

I think we only had four divers when we went to the Farallones, but to Cordell Bank my requirement was five.

So, I was searching for divers, but the time was running out because I needed to practice dives with them and make sure that they understood what it was we were trying to do, safety demanded that.

So with some maybe unwarranted confidence I scheduled the boat, *The Mariner*, in Bodega Bay, and we planned to go out. And I said to the small group, "We're gonna go out there even if we can't go diving. If we have just four people we're gonna go out there and we're gonna look at the water because we're going to Cordell Bank. We have to do that. Otherwise, this project is dying from starvation."

So just the day before we were scheduled to go, which would have been October 19, 1978, one of the team members, I think it was Dannie Baxter, said, "I have a friend who's a good competent diver. I will vouch for him. His name is Don Griffin."

And I talked to Don on the phone and he gave me enough confidence that he would not only be a good strong diver, but he would be willing to play any role on this project that I wished him to do.

00:05:40

And I said, "That's fine. I will establish you to be our safety diver. I will have two teams of two and you may or may not be able to go to the bottom, actually dive, but if you will function as the safety diver I will be grateful and I would be pleased and you can go out with us."

On that basis, with those five people, including myself, we went up to Bodega Bay and got on Mike Craine's boat, *The Mariner*, and we went out to Cordell Bank.

And we searched like we had done six weeks before when Mike's wife had indicated that he had been there once before. We searched here and

we searched there. Our navigation consisted of a LORAN-A receiver. That preceded LORAN-C.

LORAN-C could locate you within a few hundred yards or so, or at least could return you to the same kind of a point. LORAN-A was an old radio receiver that you turned a dial on to make a little squiggly signal showing on a display tube about 2 inches in diameter.

You turned the knob until that display sort of intersects itself. Then you read on the dial, then you consult some numbers on a table and that tells you where you are within plus and minus one mile.

But on that day the second channel – to locate yourself you need two coordinates, latitude and longitude – so on that day one of the channels was not working. So we knew where we were on Cordell Bank within plus and minus one mile north and south and plus and minus infinity east and west.

So we spent many hours that day surveying – that’s a nice technical term – we were wandering about hoping to find Cordell Bank. And we kept saying to ourselves, “Holy cow, this place is huge, it’s four miles wide and nine miles long.” We can’t even find Cordell Bank much less find this quarter mile diameter that we thought divable area where it says 20 fathoms. We couldn’t find anything. It was all way too deep for us to dive.

And we were even speculating about having to go back. And so I was saying, “Well, at least we got here. We think we’re on Cordell Bank,” and so on. And then I remembered how Edward Cordell had found Cordell Bank. He looked around and he saw a whole bunch of seabirds over on the water *over there*, and he went *over there*. And after hours of frustrating unproductive searching right where the birds were was where the shallow water was.

So I said, “Mike, look there are a bunch of birds over there. Why don’t we go over there and look?” And sure enough that’s – bingo, we got 20 fathoms, pulled up that 20 fathom mark just like that.

So when we got that we scrambled and dropped the descent line, not as precisely as we later learned to do it, but we dropped it somewhere in the

vicinity of that 20 fathom mark, and from that point on we knew we were able or probably going to be able to carry out what would be the very first dive on Cordell Bank.

Livingston: Now, this is jumping back just a little bit, but how did you feel as you approached that day of the first dive that had been scheduled? What was going on inside the day or two before?

Schmieder: The day before, until I got the fifth diver, Don Griffin, was very disheartening to me, very frustrating. I kept repeating my own mantra to myself, "We never give up."

00:09:56

And yet there I was so close to feeling like this turned out to be too hard to do. And then I would say, "Am I gonna explain to all these people that I gave up after all this?"

And then we found Don and I had the fifth diver. So I had enough breaths of air there to get me through 18 hours. It was a very tentative time. I was very worried that we didn't have, you know, that we would be frustrated. That is, we would be unsuccessful because of another factor.

There would be – a car would break down, or we would – Mike Craine would be sick. We would forget to bring our dive gear. Somebody wouldn't show up. You know, some reason that would frustrate us.

After all, over that year, especially toward the summer and fall, we had scheduled boat trips out to Cordell Bank eighteen times and probably half of those times we came up to Bodega Bay and loaded all of our dive gear, our twin tanks and our wetsuits and everything in order to go out to Cordell Bank, only to either decide not to even leave the harbor, or we would go out, go around the corner, it would be rolling big waves and we would turn around and come back, eighteen times.

Livingston: So those eighteen times though you had planned to dive those days?

Schmieder: Eighteen times we thought we were going to be going diving. But we didn't succeed on any of those. And so on this particular time that you're asking about, when it looked like yet again we were on the verge it was yet again a time to go up to Bodega Bay and load the boat, without really knowing whether we were going to succeed in getting out of the harbor,

much less going out to Cordell Bank, even less than that, succeed in diving.

But I knew at that time, that this was opportunistic. If we weren't there, if we said, "Well, on the average we can't do this." Then we would never do it.

It had to be the exception that would allow us to do it. And that's how it happened in the end.

Livingston: Describe the weather and sea conditions that day.

Schmieder: In retrospect it turns out to be rather typical. We were inexperienced at the time, so we couldn't really – this is partially why it cost us so many unsuccessful attempts. You go out of the harbor and there seems to be a fair amount of surface energy, you know, waves and things, sometimes big rollers right out of Bodega Bay.

If you're faint of heart you turn around and you say, "It's gonna be too rough." But what we learned eventually, and what happened on that particular day, October 22nd. We went out through that rough water and then it became clear and calm.

And from about 5 miles out all the way to Cordell Bank and all day long it was as flat calm as we ever saw it subsequently. It was one of these ripples-on-the-water day.

So we were blessed with that. It was a good time to have no problems. You know, I codified that into Bob's Law About Miracles of, "When you need a miracle, there's one available." There was one that day.

And now that I think about it I want to make sure that in the record it's correct that our first dive was October 22, not 20th. I often confuse that because it was George Davidson who discovered Cordell Bank on October 20, 1854. We were on October 22.

Livingston: How about the atmospheric conditions that day?

Schmieder: Totally calm and beautiful. I don't remember any clouds. I don't think there were any clouds. There were a lot of birds. There was not enough

waves on the water to remark about. There were not even little wavelets. It was enough to see ripples expand from the birds bobbing on the surface.

Livingston: A little bit on the onshore preparation whether it be the day before or the day you drive with all your equipment to the boat. What did that entail, loading up the boat? What did you have to be sure to bring?

Schmieder: Nothing remarkable. You know, every diver does this; he gets his dive gear together. And so he has a dive bag. I had a dive bag at the time, and you put your wet suit in it, your weight belt you put around your waist and load it in the car.

That's basically it. The photographers have to keep track of their cameras. I did bring goodie bags and tablets and clipboards for writing notes and camera for top side pictures and so on. But it was unremarkable, except for the fact that we had twin 72 cubic foot tanks or bigger and I used twin 80 foot aluminums, and these were big and heavy. And so it meant carrying a lot of gear.

Livingston: Now you found conditions right out there. What about that marker you had left before?

Schmieder: *[Laughs]* We were so naïve. Perhaps that marker lasted a day. Cordell Bank is not exactly on the main shipping channel, but it's not so far and we have been diving, we had diving operations underway when a great big container ship goes smack across the top of Cordell Bank.

And on occasions like that we would panic and we would get on the radio and we would fly flags and all try and get their attention because the nightmare would be that this ship would just run over us and kill us all which happens now and then out there. We all remember the *Jack Jr.*, a fishing ship, that was killed by an anonymous vessel.

So knowing that now, the idea of leaving a marker out there, especially such a flimsy one as I put out there, is beyond silly and almost the kind of thing you don't want to confess.

But here I've confessed it. So, of course, that marker was not there, long since swept away either by vessels or just by the sea itself.

Livingston:

You did look for it as you were heading out?

00:17:00

Schmieder:

Oh, we looked for it and looked for it and looked for it and wondered why it is it's not there. But, of course, now we would be a lot more calm about that whole thing.

Livingston:

Now, you're ready to dive and you dive. Could you tell the overall story, maybe blow by blow, you're ready to dive and this first dive? Who went down, things like that.

Schmieder:

Yeah, well, and a good part of this I've never told because these are some details that I usually don't have the time to tell these details.

After probably three hours this got to be maybe 2:00 or 3:00 in the afternoon, it was more than three hours of searching for the shallow place, maybe it was 2:30 or so. And we finally hit the shallow 20 fathom mark on the sounder, threw the line in with a buoy.

We didn't have what we subsequently required, which was a live inflatable boat on the descent line with a safety diver suited up in that boat. So Don [Griffin] did suit up and – to play his role, which he did, as the safety diver, but he stayed on board.

So as soon as we got the line down we decided – okay, I said, “Stop, let's assess the conditions, let's look at the current, see if we can actually go diving.” Just then the fog rolled in and it was zero visibility. Where that fog came from, I haven't the slightest idea. But we were in soup. We didn't have visibility the length of the boat, which was probably 38 feet.

And I wasn't gonna dive in zero surface visibility. What if a diver floated away? And there was a good chance of that. We didn't know what the currents were like. What if a diver came up not on the line, away from the boat? He couldn't be heard and he couldn't be seen. So it's absolutely not diving, period.

So we waited, and pretty soon the fog became patchy. I think we waited a half an hour or so. It became patchy and then I had to make a decision, is it clearing enough so that we can prepare to dive?

And it seemed to be, so I decided, “Okay, let’s get suited up and be ready if the conditions are good enough.” So Larry Pfoutz and I got suited up. I decided I would make the first dive.

This was the same decision that Neil Armstrong made when he and Buzz Aldrin had to discuss who would step on the moon first. And Neil Armstrong said, “Well, I will, of course.” So I said, “I will make the first dive, of course.”

00:20:10

So it took us half an hour or so to suit up, and the conditions were fine. We seemed to sense that there was not an awful lot of current, at least on the surface. So it seemed safe to do it.

And so when we were ready I had the boat circle around and Larry and I fell over backwards into the water on Cordell Bank, and then went down.

Livingston:

And describe going down.

Schmieder:

First of all, when I went into the water I had an instant rush of realization, “I am in scuba gear getting ready to go down on Cordell Bank.” And I think you can appreciate after a year – more than a year, of preparation, talking strategy and so on, the act of actual doing this was what people must feel when – when the astronauts get into a rocket and this thing finally takes off after years, maybe a decade, of preparation.

And I had that rush as I went into the water, and as I sort of got oriented and got to the line. I said, “Holy cow, this is actually going to happen here.”

There was not so much current on the surface, everything seemed favorable and I was just very cognizant that, “This moment is happening now,” whatever that means.

So I started down the line with Larry. And I think we sort of took turns going down the line. I was ahead, he was ahead. And surprisingly soon I started seeing what I assumed was the bottom. It was sort of this greenish gray opaque cover below me.

And I thought, “How cow, we’ve done all this and we are at the bottom and it’s only 60 feet down and it’s mud. And that’s all there is. Darn it,” or some thought words like that.

So we continued down and as I went down, this gray green blanket started getting texture and a mottled appearance, and then I realized it was shimmering. And then, only then, did I realize I was looking at fish. Somehow I had not been prepared. I had not thought about seeing rockfish. I was used to thinking there are gonna be rockfish, like, lingcod on the bottom.

But I had not actually seen in my previous diving a solid opaque blanket of rockfish. And so I was unprepared to even recognize it. It didn’t occur to me these were fish until we got close enough to see here they are shimmering.

And as I approached them I probably was only six feet away or so, maybe even less than that, they started slowly parting, as fish do. They moved very gently and slowly, but of course, you can’t come close to them, they know how to keep their distance.

And if you can imagine having an opaque curtain in front of you and then a small hole opens and it widens like an iris, and as that iris opened I saw below me this extraordinarily colorful, exquisitely beautiful, astonishingly bright landscape below me with these colors pink, especially, white, especially, but maybe some other purplish colors.

It was not gray. It was not maybe the fluorescent plastic colors that you see on, you know, traffic markers. It wasn’t that bright. But the combination of seeing colors of any kind, and also my mental state, and also probably starting to get a little bit of nitrogen narcosis, which enhances your perception, to me at that time was an astonishing, overwhelming visual experience.

And I had another moment of realization. At that moment, just when I saw that, it was – the moment was, “Holy smokes, I am here, I’ve seen it. No matter what else I do in my life. I have seen Cordell Bank and I’m the first human to do so.” That’s what I thought about.

00:24:58

And then I had to stop and I just hovered looking at this, looking down at it maybe 30 feet below me, 40 feet. It couldn't have been much more than that. I just hovered there for a while and looked around and looked at sort of the geometry, the pattern of the colors.

I tried to sort of not look at details. I wanted to see sort of the pattern and I was looking around to see this quarter mile wide so called big flat area where we could wander around, which I knew by that time probably was not there.

All I could see was this very narrow ridge below me, and it trailed off into invisible dark depths off to the edges. My peripheral vision at the limit of visibility it was probably 80 feet or 90 feet or so. And it would go out of focus at the limit of that visibility, but everything inside of that was like a jigsaw puzzle of colored pieces.

And that's when I knew that I had been to the proverbial symbolic mountaintop. This had to be the same experience that Hillary had when he stood on the top of Everest, knowing at that moment you have just done it. And anything after this can never change the fact that you've done it. We succeeded, we are here.

It was an exhilarating feeling. So Larry and I slowly drifted toward the bottom and we got to the bottom and I just sort of sat down on the bottom, kneeled on my knees on the bottom. And I turned to Larry and I moved my hands in and out with this gesture, you know, moving the hands, flexing your elbows back and forth like this. And he did it back to me. This was a statement like, "Do you believe this? Is this incredible or what?" sort of a feeling.

I didn't take an awful lot of time once I got to the bottom to look around, because I immediately became aware that I had very limited time. I forgot that for a moment. I was into this sort of Wonderland, this visual experience.

I wasn't narced so bad. I was clearly conscious, I was clearly lucid. It wasn't that. But I was so overwhelmed with how significant it was. We had worked so long and so hard, and then how rewarding this has turned out to be.

It is not what the biologists had said it would be, dark and cold and deep and uninteresting. It was light and it was colorful and it was fabulously interesting. It was incredibly interesting.

So once that passed, that immediately emotional response, I became aware that I'd better come back with some results or I would be a goat.

So I got my goody bag and trowel and I went around ripping the place up. Of course, you can't do much damage. I didn't feel one bit guilty. And I went around cutting things off and picking things up and putting them in the bag. And I pretty much, maybe half full – a fairly large bag, big chunks of hydrocoral with sponges entwined in it. And all the commensals and obligate commensals that came therewith.

I was not aware of those at that time, but I was aware of collecting big chunks of things, which I did very vigorously. I don't know really what Larry did during that time. I think he circulated around and watched me. He did not have a camera, so we got no photographs from that dive.

And his role basically was safety diver for me, watch me, am I okay or am I in trouble and he was a very strong diver, very responsible, and I felt very secure having him there.

So I went about my business and collected the bag of specimens, watched my bottom timer and when it became time I sort of flattened out and looked downward as I allowed myself to float up. And I watched Cordell Bank sink slowly deeper and deeper, get smaller and smaller features, fewer features until it was hard to distinguish the details that I had just seen.

And I was very aware – I tried very hard to fix that image in my mind. I needed to remember every frame. I wish I had been a movie camera that I could capture every frame. That's what I was trying to do as I slowly backed out of there.

00:30:12

And then suddenly the whole place went blank because I had passed through the level of fish, and all I was looking at was this shimmering carpet blanket of fish. And I floated away from them and they too went off into the darkness and the dive was over.

Livingston:

Getting back up into the boat what were you feeling and thinking?

Schmieder:

Once you've done a dive like this, the physiological feeling is one of extreme power and vigor and strength. And the reason is you have a lot of nitrogen in your body and oxygen. And so you come out with a lot of exhilaration from deep dives like this.

So I broke the surface, the boat was right there for us, and Don acting as the safety diver was there to take my bag of specimens. And I don't remember what I – yes, I do remember what I said. I said, "You're going to like this." Those were the first words I said, I think. "You're going to like this."

They hauled us out. I don't actually remember the mechanics of getting back into the boat. But there we were and I think I repeated, I said, "You're going to like this. You're just gonna love it."

And I showed them the bag of specimens. We didn't really open it up. I reached in and took out a chunk of hydrocoral and I said, "Look, we got it. We did it," or something to that effect.

And we spent perhaps 10 minutes gloating and gleeing and feeling triumphant. And then I had to decide were we going to put the other team in the water or not. You know, should we go home at this point? Because it would be a risk to put in another dive team. This was not an easy dive, although relative to some of the dives we did, this was a very easy one.

So we watched the conditions. The fog was of great concern. The fog had come and gone. While we were on the bottom the fog had come and gone. They had stuck right close to the descent line.

So as the conditions improved again I decided, "Okay, we'll do the second team in." And I said, "Why don't all three of you go? We are suited up; we will act as your safety divers. All three of you go." Which means Don Griffin, Steve Lawler and Dannie Baxter.

And so they did. And they went in and I waited very anxiously on the surface for them to get back. It was a nominal dive, 15 minute bottom time, and they popped to the surface and had some specimens and I was so triumphant in my feeling.

So we got them back on board. And I have a small story to tell about when they got back on board. Once they were back on board I knew that we had not only done what we said we would do, but we would come back over and over again. I knew that I would be coming back for 10 years exploring and describing this place because one thing that I had not known the previous day, and that was, “Could we do this?” And the answer was now, “Yes, we can do this.” So we did.

Would you like me to tell you this little story about the second dive team then? I had given very clear instructions all along that we’re not going to collect artifacts. Like, “If you find any fishing gear, and you probably will, we’re not gonna collect that stuff,” boat anchors, cans, bait boxes, you know? “If it’s gold bullion, yes, maybe, but we’re not gonna collect artifacts. Please do not waste your time doing that. We are here to get biological specimens.”

Ironically, Don Griffin, the fifth diver who joined just the day before had not heard this from me and I somehow failed to convey that to him.

So when Don broke the surface he had in his hand, he said, “Here, can you take this?” And it was an anchor; it was a small, heavy boat anchor. And so we brought it up and we pulled it on board.

00:35:00

And then we got the team out of the water, all three of them, and they got all back on board. “Are you okay?” “Yes, I’m okay, everybody’s fine.” So we’re standing around talking about this and I looked at that anchor and I said – and we have this on tape actually, on audio tape, “You’re not gonna believe this,” I said. And I’m reproducing this verbatim, “That’s the anchor I threw out here with a marker line six weeks ago.”

And what had happened was when we had our survey crew six weeks earlier and I threw out that flimsy little marker I used the only anchor that I had with me, a little boat anchor, I think it was actually Mike’s, threw it – no, I brought it to set out the marker.

Threw it out on this – where we found roughly 20 fathoms, just some place, and we had no knowledge at that time how extensive that place was.

Then when we went back on this first day of diving, I had not told Don to not pick up any anchors, and by the most miraculous coincidence we had dropped our descent line anchor for that dive about 20 feet – 120 feet down, 20 feet away. And not only that but Don, when he saw that, decided to collect it even though I thought that he had known to not collect any artifacts like that.

So I kept that anchor for many, many years and eventually it disintegrated. It was a souvenir for many years. And it was this miraculous – the good luck anchor. We actually brought it out with us on subsequent expeditions as a good luck charm. Not that anybody believed that, but that's what we did.

Livingston: Fantastic, that's fantastic. A couple of technical items about the descent line, for instance. How did you set it and was it marked as you went down? What was your relationship to it when it was set and you went down?

Schmieder: Yeah, on that first dive, and it took us a while to figure out that the topography of the bottom is extremely rough, that the pinnacles and ridges are extremely small. So it's almost impossible to put a vessel on top of it and say, "Okay, it's 20 fathoms right here, drop the anchor right here," and have that anchor fall onto the pinnacle.

It normally drifts off somewhere else, the current takes it 100 feet away and it misses completely. And we had plenty of experiences like that where we went down, in fact, the next year 1979, we only did one dive that year. The team of three went down and they found the line – the anchor hanging loose at about 15 feet above the bottom at 205 feet because it had missed the target.

On that particular day, on the first dive, we learned that the ridge, the pinnacle is so tiny that you can't just approximately drop an anchor on it, you will miss it. And this coincidence with the previous anchor is not such a great coincidence because there was no other place 20 fathoms deep anywhere nearby for a mile or two away.

So having succeeded in dropping the anchor on that place, it's not surprising that the first anchor was right there because that's the only shallow place.

Then recognizing from seeing it on that dive, recognizing that these are tiny pinnacles or ridges, and very often they are ridges, so they are kind of long, but they're extremely narrow. What we figured out was if we would first find the coordinates, find the location, record the coordinates on the LORAN, then we would steam the boat up current, transversely across the ridge, drift backward and at the best guess location drop the anchor, it would drift down and hook on the up current side of the ridge, the line would go right up the ridge and across the top.

Now that's a pretty tricky operation, but we made it work. We learned how to do it. So well, as I recalled earlier, when Cousteau and his group and I went out there I set the anchor for them and I dropped it probably 10 feet from where I – I was very familiar with that particular ridge and I was able to drop it 10 feet from where I wanted to put it.

00:40:05

So it's a skill and it's one of the reasons why we were successful in diving there repeatedly. Whereas if somebody went out fresh, like Cousteau had never been there, wouldn't know how to do this. That was the technique that we evolved for hooking onto those tiny ridges, and it worked very well.

We could do it about half the time perfectly about a quarter of the time imperfectly and about a quarter of the time failed totally.

Livingston:

Now, the descent line, is it marked? And when you're going down and back up, are you attached to it or –

Schmieder:

Yeah, we had a rule, it was one of our safety rules that you could never go out of sight of the line. Some of the divers would carry a transect line which they would hook on to the anchor, or onto the line somewhere on the bottom, and stretch it out behind them. But the rule was you could never, ever go out of sight of your return line.

In addition, we attached flashing strobes at 10 foot intervals up from the bottom. We attached those before we would put the line down, or in some cases actually the – when the conditions were good and the divers were good they would attach – the first team would attach the strobes on their way down for the other teams.

And it was typically Bill Kruse and Tom Santilena, specifically, who were the strongest divers and they would do that. So on the bottom, why would we need the strobes? It is sort of dark, surprising large amount of ambient light but also when you become narced you can't see things as clearly.

And I have an incident that I could recount for you that involved me. But the strobes were there to be beacons to bring us back, and they actually functioned that way. We were saved – stabilized and saved, by having those flashing strobes at 10 feet for about five or six of those strobes.

Livingston: Did the second team for that first day take any photos?

Schmieder: No, we didn't have a camera. Ironically Don Griffin had a camera and he was an underwater photographer, he would have loved to. But somehow the word – he was the last person to join the previous day and I guess somehow we had not told him.

One of the other team members, Dannie Baxter had interacted with him and I guess just had not told him to bring his camera. So there we were without a camera.

Livingston: Now, there you are out there. Did you – other than the dangers of diving that you were well familiar and prepared about, did you think about ships coming through while you were down? Sharks? Things like that? Was there any sense that there was anybody else out there or any dangers?

Schmieder: The team talked a lot about sharks. I didn't get caught up, and I tried to damp off all that talk, not only because it was not productive, but it was a binary decision that everybody had to make. If you don't want to go in the water where there may be sharks, you should not go in the water.

And quite a number of people did not. They didn't stay with the project. Out of the original 40 some of them dropped out telling me, "Well, it's pretty sharky out there. I really don't want to do this."

I took the position that I had talked to the fishermen who go out there and they saw a bunch of blue sharks. They saw blue sharks regularly, but never any Great Whites, never, ever any reports of any Great Whites. And those are the only ones we were worried about.

And the reason for this is that they find their food at the southeast Farallon, that's where the elephant seals haul out and there's nothing for them at Cordell Bank.

So we just didn't talk about sharks much. And eventually we did have an encounter or two. There was an El Niño in 1983, the water was warmer and I was hanging on the decompression line and a very large mako shark came zooming. And they are frightening, those fish. They swim so fast, and they appear out of nothingness because your visibility has no transition. It just goes off into fuzzy nothingness.

And suddenly there's a shark coming at you at high speed and then he gets up two feet from you and veers off. It was a bit unnerving. Other than that, we didn't – over the whole time we were there we never saw any Great White sharks on Cordell Bank.

00:45:10

And on the first dive I don't think it ever entered anybody's mind. We were so focused on the fog which might – first of all, finding the place, secondly, the fog that might frustrate the diving, third, the mechanics of the diving, just carrying it out, and then fourth, just the exhilaration at having succeeded.

So I don't think the word "shark" was ever mentioned the first day. It just wasn't in our consciousness.

Livingston:

Now the divers are back up, this first dive. I assume you head back to Bodega Bay. What was the conversation and the feeling on the boat as you all were heading back?

Schmieder:

You know, I don't remember that as clearly as I remember some of the events that I've just told you about. What I know habitually we did coming back is we would sit on the stern of the boat and we would kind of stare off at infinity and we would congratulate ourselves for being so good at what we were doing.

And we would talk about future plans, "Well, let's do this every weekend." And, "What are you gonna do with the specimen?" We would bring with us manuals, the keying guides for keying out specimens.

Generally, and I believe on that particular day, I would busy myself with sorting the specimens because I was very aware at how quickly they had to be fixed and protected, preserved.

So what I did as we were coming back on that day and on all other successful dive days is, I emptied the goody bag out on some sort of a surface and we brought with us a whole bunch of jars and formalin and alcohol. And so we went around picking the specimens apart and putting them into appropriate sized jars, adding alcohol for the invertebrates and formalin for the algae, and writing out labels.

Because I had prepared little paper labels on non-disintegrating paper, you write on it with pencil, because the ink washes away. And so by the time we got back to Bodega Bay that entire collection was sorted and labeled in jars. And from that I could then – and I did pass it around to a variety of specialists in various institutions, including the Academy, for whatever they wanted to do with them.

But that was our currency. We essentially had sort of like gone to the moon and collected some rocks and now there's somebody who wants to see those rocks. It wasn't quite as big but we felt at the time that it was almost as important.

Livingston: Speaking of rocks, did you bring up a rock?

Schmieder: Not on the first dive, that's for sure. I totally underestimated how hard that rock is. Cordell Bank is made of a granite, or a granodiorite. Those are different just because different amounts of minerals, orthoclase, plagioclase, quartz and biotype mica.

What I underestimated was the hardness of this stuff. Well, it's not as if I've never seen granite before. Somehow I had this image I was gonna take my trowel and chip off a nice chunk of rock and pass it to the geologist.

Well, that was sort of like chipping something off of a marble building that you might see with a – are you kidding? This was incredibly hard. So we got no rocks.

And it wasn't until two years later that the Sacto [Sacramento] team, the real strong divers, assembled a pneumatically driven jackhammer, and all jackhammers are driven pneumatically. They made an underwater jackhammer which they fired with a third scuba tank that one of the guys wore, and they used a jackhammer to chip off a few very small chips of a vulnerable place. And that's all we could get. That's all we ever got because that rock is so hard.

Now, if you're the U.S. Navy or, you know, some big corporation and have resources you can certainly do things differently. But we had no resources to speak of.

Livingston:

Did you or your friends on board have any experience to compare it with or even physically the place you saw there on the Cordell Bank, did it remind you of other places you had dived or was it unique?

00:50:27

Schmieder:

It was unique. I had never seen anyplace like that, but again, I had only dived up and down the California coast, not to the Red Sea and so on. But I was sufficiently well prepared, and I tried to quantify in my view, I tried to sort of quantify what I was looking at, I tried to fix it as images and try to look at it, not just gaze at it, but look at it.

And I did as well as I think could be expected. It was not like any place I had seen before which doesn't make it, you know, superior in any sense. Because every place in the world is unique and intrinsically just as valuable as any other place.

But it clearly was qualitatively different from places I had seen say at Monterey where you're close to shore and up the coast to Salt Point and so on. This was a different kind of community, and that's one of the reasons I knew that I would come back year after year if I could and explore it.

Because clearly this was counter to what had been predicted by a number of professional marine biologists, different from anything I had seen in some years of sport diving. Just obviously, visually different and therefore worthy of exploring and describing.

Livingston:

I want to clarify about the crew. There were the five divers, there was the skipper. Anybody else on board?

Schmieder: There was my wife at the time, she was on board and took pictures. So we have surface pictures. And there was one other person, I think it might have been the skipper's wife, again. I'm a little vague on that. I'd have to check the record. I think she was on board as she was when we surveyed six weeks before.

Livingston: This was Craine who you had gone out with before.

Schmieder: Mike Craine.

Livingston: Mike Craine.

Schmieder: He had the boat, *The Mariner*, in Bodega Bay. I think he subsequently moved into Santa Rosa.

Livingston: Now, you returned to shore and packed up your car, I assume, and headed home.

Schmieder: Went home, yeah. Not too fancy, just went home.

Livingston: So what did you tell people in the days following? And also address the media and what the feeling was as you went back out into the world after this experience.

Schmieder: There were several people I keyed in on that I wanted to know – I wanted to hear, I wanted to tell them right away, and I was very keen on the following. First I called my dear mother and father and said, "I've done it." "Wonderful, we're so happy for you." That sort of family connection. That was number one.

Number two was, I called and I believe I left a message for Skip Garretson at the *Oakland Tribune*, that we had finally succeeded in diving on Cordell Bank and we had specimens. And I don't remember exactly when I got back in contact with him and filled him in. But I gave him an interview, I think in the next week or so, a long talk over the phone and he wrote an article and they made a sketch.

In fact, the sketch that appeared in the paper is in the book, I believe. It's – here, it's on page 29. This sketch of an underwater scene was made by Frank Pinnock, an artist who worked for the *Tribune* at the time. And he

made that sketch from my verbal description over the telephone. And when I saw the sketch I gasped and I said, "That's exactly what it was. It was exactly that." His sketch was so appropriate, captured it so well.

00:55:00

I had two other people I wanted to contact right away, and one was disappointing. It was John Hall whom I had done the first strategy with, and I didn't reach him, and never did again. Never – and I have no idea if John ever knew that we had succeeded in diving on Cordell Bank.

And the other person that was very keen on telling was Don Dvorak. And the reason is Don had started with us on the project and he had been to every meeting and every strategy session and talking a lot.

He and I became close friends. And it was so frustrating out of eighteen times trying to load up the boat to go to Cordell Bank finally he had an opportunity in late October, the third week of October to go to the Grand Canyon, and he went. And it was that weekend we succeeded with our dive. And I had to call Don sort of like the General calling the Sargeant's wife to tell Don, "Don, I have good news and bad news. The good news is we dived on Cordell Bank, and you know what the bad news is."

And he said, "Well, I'm sorry to have missed it." The irony is that he stuck with the project, worked again for a year, then next year, 1979, we made only one single dive and Don was on board, but he was not the diver. And after that first dive I had to abort the rest of it, the conditions were wrong. So it wasn't until the third year that Don succeeded in diving on Cordell Bank.

Livingston:

Now, you've had your first dive and you've described that quite well. So what did that first dive inspire in you in the following days or weeks? Did your goals or plans change after that from what you'd learned?

Schmieder:

Well, as you can easily imagine, we were almost to the point of giddy with our pleasure at ourselves. You know, we were so happy and so proud. So we decided to have a public meeting. And we had connections at the Cal Academy and they made available one of their meeting rooms.

So we decided, I think it was in November, to have a public meeting and display what we had done. And so word of mouth got around and we had slides, not underwater pictures, but other pictures, and we put together a

bit of a program which included introducing various people who had been important in participating in this.

Ironically as we were assembling in that meeting room for this public meeting the San Francisco Microscopical Society was meeting in the small room adjacent. And when they – somebody came in and said, “What are you doing here?” And we said, “We just came back from an expedition to Cordell Bank and we have –”

They said, “Well, may we join you?” So they adjourned their meeting to join our meeting and our ranks swelled. So we had maybe 50 people at this meeting.

And so we described what we had done and it was trivially easy for me to project into the future. So I said, “We want to go back to Cordell Bank and we know where to go, we know how to do it now.” I showed a lot of confidence, some of which was not yet earned. “And we’re looking for anybody who wants to perhaps participate in any way you like.”

So the San Francisco Microscopical Society offered to look at any diatoms we might collect, and I handed them a jar of diatoms, or stuff, gunk, grunge, we called it. But the really important thing that happened was that there were several people there who had been friends before and had participated in diving projects before, in particular an underwater cave diving project.

Now, cave diving is serious stuff. I wouldn’t do that. That’s for really good people. But here were three people, Bill Kruse, Tom Santilena and Paul Hara, and they had carried out this project up in the Sierra and had dived on an underground river and lake and had collected cave adapted specimens, several of which had been subsequently identified as new species and described in the literature and named for one or more of these people.

01:00:19

They came to me after the meeting and said, “We’d like to join you. We’d like to participate in this if you would like us to.” And they explained who they were and what they had done. And I recognized instantly these are the kind of people I had dreamed about finding, project people, extremely competent divers.

I said, "As of this moment you're part of this project." So Bill, Tom and Paul became lifelong very close friends, and at the same time, actually at that same meeting, was another man, Harry Sherman, who was not part of that cave diving group, but Harry Sherman, Bill Kruse, Tom Santilena, Paul Hara showed up or appeared at, I met them, at that public meeting after our first dive, first expedition, and they together with Don Dvorak and myself became the core team that essentially carried out and led and then trained so many others to go out there and do the rest of the project over the next six or seven years.

Livingston:

Bob, could you talk about the next dive in 1979? Tell us that story.

Schmieder:

After our success in 1978, and we were so optimistic and we had this public meeting, suddenly the team swelled in size. I suddenly had what I considered for the first time a competent team both in terms of scientific orientation and diving capability, technical diving capability, as well as team members who were really into the project as a project, not just going along for some other reason.

With that optimism we planned to go back and in 1979 to carry out a much more extensive series of dives, get the first photographs, for instance. We had seen it, now we needed to really document it, and that's what we had in our minds, our plans.

And we planned accordingly, and by that time we'd learned a little bit about the weather and the sea states. So it didn't take us eighteen times to get back out there.

So when we did we got out there and the conditions were acceptable. They weren't as good as the previous year, they were acceptable. What went wrong was we couldn't find a shallow point. And the reason was we decided to go not to the same location that we had dived in 1977, but to start exploring other areas of the bank.

We thought, "Well, this is fairly easy." And in the meantime we had done some surveying, which means we had just driven the boat back and forth recording our positions as we went, and recording the depths on those positions.

So we were doing surveying at a very low rate, but we started discovering other points that were 20 fathoms or less, and we were amazed. They were not on the chart. There was no hint. No one had ever indicated to us that there would be other diveable points.

So by the time it came to expedition time, October in '79, I decided, to go dive on one of these other points that we had discovered, the shallow points.

There's a ridge up near the north which I tentatively called Tor Hakluyt. Tor means "mountain." Hakluyt was a cartographer in the 16th Century, did a lot of the maps that we now know as classics.

So we went for that as a target. Everything seemed to be going just fine. We went out there and we eventually found a shallow place. It was not 20 fathoms; it was something like 22 or 23 fathoms, fathom being six feet.

So, you're talking about 140-50 feet, that was still acceptable. We dropped the anchor. We had not yet evolved reliably the technique of going up current and hooking on the back side. So we dropped the anchor thinking we were hooking on the place.

The anchor seemed to be stable. So I decided we'll get the team in the water. The first team was Bill Kruse, Tom Santilena and Tom's brother John Santilena.

01:05:25

My strongest divers, and year after year I used them for the first dive because they had to be adaptable and resourceful. If anything went wrong I wanted them, more than myself, to be there, because they were better than I was – stronger at handling the diving, the mechanical aspects of diving.

Everything seemed fine. So we put them in the water and watching the watches and eventually the time went by and we were saying, "Well, they're about half way through." And suddenly Bill Kruse came zooming out of the water like a Polaris rocket. I mean, it seemed like he leaped completely out of the water, which he couldn't have done, but it seemed like that.

And simultaneously let out a yell that sounded like he had just lost the lower part of his body. And I muttered, "Shark." And I thought that we would see nothing of Bill but a few shreds. I thought that was – this was a disaster in real time.

And pretty soon John Santilena came to the surface away from the line, but clearly under control, and eventually Tom came to the surface, I believe it was on the line. And Tom came up, but Tom's a very calm, collected guy, and he came to the surface, he says, "Well, how's it going?" or something, you know, like that.

And I said, "We've got a major emergency going on here." He said, "Oh, really? What's the problem?" I said, "Well, Bill's out there and he's probably dead." And Tom said, "Oh, no, no, Bill's all right."

So we went around and we collected these people, got them out of the water and said, "What happened?" And what had happened was they went down the line, John had a goodie bag for collecting specimens, Tom had camera and Bill Kruse was the safety diver, I think.

They went down the line and down the line, the visibility was wonderful, there was no current to speak of, and they got to the bottom of the line and the anchor was floating about 15 feet above the bottom and drifting away.

What apparently had happened was we had dropped the anchor on the down current side of a cliff, as the sea and the current lifted the buoy, which was actually an inflatable boat now; it had pulled the anchor up off of the bottom enough so that it was completely off the bottom.

And as it drifted further the bottom got deeper and deeper, so it never got on the bottom again. Because you have to remember, these are tiny, narrow ridges. So by the time they were going down the line, and there's no visual reference out there. We had no idea they were completely way off of the shallow place.

So they went down to the bottom, or near the bottom, they could see the bottom right below them. John and – well, actually all of them went right to the bottom. They let go of the line and went to the bottom at 205 feet, collected some specimens, not many because there were not many there at that depth, as you know from the photographs.

Tom took some photographs, the first photographs taken on Cordell Bank, at 205 feet. And as they surfaced Bill Kruse's dry suit valve stuck and it inflated him like a dough boy and he came out of the water at an uncontrolled emergency ascent.

And he did the sensible thing, he yelled. It sounded like he was being killed, but he yelled to get our attention. So they had done superbly, this team, incredible. And I just couldn't believe that they had done this. And I didn't even know that they had gotten specimens. I knew that he said he'd taken some pictures.

And we were all just sort of regrouping and getting our bearings and calming down and John said, "Well, did you look at the specimens?" And I jumped up and I said, "Specimens? You got specimens?" And sure enough he had a small collection of specimens which in the overall scheme they were pretty inconsequential, but these were specimens.

01:10:08

So we had not only done it the previous year, we did it again to show how good we were, and we had photographs now. So we could now claim – we didn't want to show the photographs because they're pretty meager, but we could now claim we are capable of collecting specimens and taking photographs at the bottom at Cordell Bank.

That was good enough for us to throw another public meeting at the Cal Academy, which we did, in the same room. And we had about the same number of people. But unfortunately, we didn't have, you know, a huge inventory of, you know, a rich collection of things. And so we made the most – got the most mileage out of the tiny collections that we made.

But the success that they had in doing that under those conditions allowed me to decide, "Okay, we can still do this. We're not going to close the expeditions and stop. We will try it again next year." And from the next year on we did very well.

Livingston:

From what you had learned in the first and here second dive, did you alter your preparations? You must have learned some things to help you prepare.

Schmieder:

Well, I think we learned that it's critical to know how to set the descent line and how to test it. So when we would put the line down, first of all we evolved this technique of hooking the backside. Then we would get the inflatable tied on it. We would test it. We would pull on it. We wouldn't just assume that it was in place. It may hit the right place but it might not stay there.

And these are hooking type anchors, not deadweight anchors. So we did that and that enabled us to get a more reliable descent line.

The gear and the procedures, the rules that we had evolved at the beginning of the project didn't change, they were always the same. Single dive for a team, for each person, twin tanks, octopus regulators and so on. The goal also did not change. The goal always had been, "Let's go and explore. Let's find out what's at Cordell Bank."

I knew at the outset that we could not do systematic science. We had to do grab-sample opportunistic science, and that's all we were ever able to do. In fact, to this day unless you bring in much greater resources that's all you can ever do at a place as difficult to access as Cordell Bank. So the goal didn't change either, just the time frame.

Livingston:

What happened to your first divers in 1978? There are four divers that we haven't heard of yet.

Schmieder:

Well, I should have been more cognizant of the naturalness of people's evolving interest. After all, we had started with 40 people at the Geological Survey and by the time we actually dived a year, plus later, there was only one person, me.

I found that very frustrating, even found myself feeling angry at abandonment, if you like. We would come up to Bodega Bay and the divers would say, well, they would look at the ocean and they would say, "That doesn't look like fun."

My reaction, which I was not always able to stifle was, "Well, we're not here for fun, *are we?* We are here for science." So I should have been better prepared.

After we had the first dive in 1978, and that was so successful, to my surprise and I guess disappointment, some of the people just sort of got – just sort of drifted away and got interested in other things.

I can't really say what their motivation was in the original dive, maybe it was just simple curiosity and then it was satisfied. Of course, by that time, and long since before, I was deep into a lifetime obsession. I was prisoner to my own obsession about this. So there was no question of me drifting away.

And when other people would drift away I would be disappointed and frustrated and a little bit irked that their commitment was not mine.

01:14:58

This was especially astonishing to me when one woman, a potential diver, said, "Well, no, I don't think I can be away from my fish for more than two days. So I won't be able to do this." And I said, "What? Your fish are more important than science?" I don't think I said it to her, those words.

So Steve Lawler, who had been a very important principal in this project, had really taught me a lot about diving. He knew about projects. He knew things like the Latin binomials for species or genus species, you capitalize the genus and you lowercase the species. This is the way you write it.

By that time I understood that, but he knew it. And so he insisted as we would sort specimens, he insisted on getting those things right because otherwise we would look like silly amateurs. Maybe we were but we certainly didn't want anybody else to think we were silly amateurs.

Dannie Baxter was always a little distant. I never got to know her very well, and she had a husband and they had other interests. So I think they just sort of had other interests.

Don Griffin faced some medical problems and I don't know any details about that. But I respected that a lot. He just felt that he couldn't – he stayed involved for a while.

And Larry Pfoutz, I guess was similar. He just sort of had other things he needed to do in his life. And it was sort of that transition – '78 through

1980 – that I saw that people would come in and they had a latency period. They would come in typically for a couple of years, then they would drift away.

The core group which was myself, plus Don Dvorak, Tom Santilena, for a long time his brother, John Santilena, Harry Sherman, Paul Hara for some time, Bill Kruse, Sue Estey. Those are the people who stuck with it from their beginning until the present time and are still deeply involved as witness whenever you have a [Cordell Bank National Marine] Sanctuary event. We all show up. And we're not here just for the baloney.

No, whatever that metaphor was. I should say doughnuts. We're not here for the doughnuts. We bring the baloney and we come for the doughnuts. Okay.

Livingston: So now 1980, you went for a third season. And so could you describe the events of that season?

Schmieder: The third season started just like the others with a fair amount of planning but now less planning, because we didn't have to talk so much about plans. We basically had proven that our preparations were sort of right.

What consumed a lot of time in that year between the 1979 dive and the 1980 dives was meeting new people, getting new people in because I needed a lot of people at that point, and they showed up in droves because the word – the reputation was around there's this project. And there were a lot of people who really want to do things like this.

So we had lots of people but I insisted on doing a practice dive, full gear, 150 feet, decompression, with every new person. He couldn't go to Cordell Bank with me if I didn't do a practice dive with you.

So that consumed a lot of time. I was down in Monterey diving with new people a lot. And then by the time we were getting ready to go back to Cordell Bank in the fall I spotted a boat in the marina at Berkeley and kind of wondered who owned this boat because it seemed to be about the right size and it was kind of a romantic looking boat. It actually had been a shrimp fishing boat.

As I subsequently found out, it was owned by a man named Breck Greene, and he had brought it from Louisiana through the Panama Canal which he moved to California after his first wife passed away.

So I left a note on his window saying, “Would you like to make this vessel available for a National Geographic Oceanic Expedition?” Carefully worded, not a lie, I had a small grant from National Geographic by that time.

01:20:07

And I subsequently found that he and his sons had strategized for days, “How can we get these guys? How can we nail this expedition – this Geographic expedition.” When we finally got to know each other he saw it was really just a group of enthusiastic amateurs doing this. But he decided to do it with us anyway.

So for a fairly nominal charge, essentially the fuel, he agreed to take us out there in this boat. It’s 67 feet at the water line. Shrimp boats have a round bottom. You can imagine how this thing rolls. So everyone except me, every time we would go out on this boat, everyone except me was deathly sick.

Why was I not sick? Because I always had something to do. I had to manage people and take data and stuff like that. Besides I’m not generally sick.

So we got into agreement with Breck, introduced him to the group, we got familiar with the boat, and then we started loading it up with as many as 20 divers plus miscellaneous support people and gear to process specimens and so on, and we would go out to Cordell Bank.

Sometimes we would succeed and sometimes not. One time we went out, we would typically leave Berkeley at 2:00 in the morning or 1:00 in the morning, and try and sail all the way up to Cordell Bank and then back to Drakes Bay.

Well, we got out a little past Mile Rock, actually a mile or two past the Bonita Light, and the engine coughed and died. And Breck went down below and pretty soon we realized he had forgotten to put fuel in the tanks. We ran out of gas, believe it or not.

And there we sat for hours until the Coast Guard came around. In those days they didn't send Vessel Assist which you have to do now, commercial organization that you pay, the Coast Guard would rescue you. So we waited for some hours, almost until dark until the Coast Guard vessel came out and towed us all the way back to San Francisco.

Another time we went up to Drakes Bay and the weather out to Cordell Bank was pretty bad. In addition Breck had the regrettable, and apparently unalterable, habit of sailing around the point right at the head at Point Reyes, right close to shore. Well, even an amateur knows that's where the big swells and surf break. And then he would come into six foot waves and turn around and say, "This is way too rough."

"Breck," I would say, "move out three miles off of the head. It's calm out there." But we were not always successful in doing that. But sometimes we were successful. This was an opportunistic project, after all. So sometimes we would go up to Drakes Bay, spend the night, 4:00 in the morning we would sail around the corner out to Cordell Bank.

And at times during that year, 1980, we would have conditions like the first year, so calm the gulls on the surface would make these ripples that would expand 10, 15 feet out.

You know, we would be in ecstasy with that. And with eighteen divers, say, we would make six teams of three divers. The rule was only one team in the water at a time. We'd get the previous team out and debrief them, and let them make the call, "Is it safe to make another dive."

And on several of the days during that year we got all the diver teams in one after another and safely back to Drakes Bay with our goodie bags chock full of specimens, huge, probably 150 pounds of specimens.

Don Dvorak would take his cameras, he mounted three underwater cameras on a bracket and he would go down to the bottom and come back with more than 100 photographs of the bottom on a single dive.

So that was the year that we essentially used the validation of the techniques that we had evolved to carry out a much more extensive exploration and documentation of Cordell Bank.

And by the end of that year we had a huge number of specimens, huge number of photographs, charts of new pinnacles that we had discovered. We discovered five of the six or four of the five shallow points.

01:25:05

And so that formed the incipient body of knowledge about what Cordell – and I was able to pull together a preliminary summary of what we knew about Cordell Bank, including some species – a beginning species list and the charts and the observations of the divers and some of the history, which by that time I had elaborated all the history with Edward Cordell.

So by the end of 1980 we were starting to get a pretty good idea what was at Cordell Bank, and felt pretty confident that we could carry on as long as we wanted to. And that was about the time that I became aware of NOAA and the Sanctuary Programs Division and that road less traveled made all the difference.

Livingston:

So in these first three dives you were still unregulated really, you were still on your own.

Schmieder:

That's correct.

Livingston:

And did you say how many dives you made in 1980?

Schmieder:

I didn't say and I don't actually remember, but I think there were probably three successful trips that year. And when they were successful they generally were very successful. We went with, you know, all the divers and a lot of specimens.

We had one trip, I think it was actually a later trip, John McCosker from the Steinhart [Aquarium] was with us, and the first team down had trouble, and I had to abort the diving for the rest of the day. John was already suited up, ready to go in. So it was a very great disappointment on that case.

And we had days like that, but we had enough successful days, I was satisfied with statistics. You know, if we have partial success, that's success.

Livingston:

And you dived during 1980 as a member of these teams.

Schmieder: Yes, I was always a diver, '79 I was not – I didn't do that one dive that Bill, Tom and John did.

Livingston: Could you describe your experiences of those 1980 dives?

Schmieder: My dives were generally less exciting, less stimulating than the very first one was. Because as I described, the very first dive was accompanied by this overwhelming rush of having crossed a threshold.

Here we knew that we could do this, and so it was a question not of existence, but of performance. So my task was to collect as many specimens as possible, fill that goodie bag. And sometimes I would take two goodie bags, fill them with as many as possible and as diverse collection as possible.

And I would exhort the team to, "Do not collect multiples of the same thing. We have lots of the *Allopora californica*," the California hydrocoral, "get different things. Wherever you look if you see something that you don't recognize, that's a good candidate. We're not trying to make a plot, we're not trying to survey this, we're trying to collect things."

And we used the words "rape and pillage" and things like that. Of course, we couldn't do any significant damage, just negligible stuff that's healed rather quickly. And so I kind of prided myself, I was satisfied with myself that I would collect large amounts of things.

It seemed like the other divers never quite caught on to how much mass I wanted collected. They would come back having picked a few things and would say, "Well, I didn't want to damage the place." Or, "I wasn't sure about this. I thought about this and I picked a few things very carefully." I said, "Where's the rape and pillage part of this?"

So I was routinely kind of semi-disappointed in the aggression that the other divers would not have when they were collecting. And I ripped and tore and collected huge amounts of things.

Of course, we can wince when we think about that, but it was local in time and space. It didn't harm anything. And after all, as I tell my students on the boat now, "If a few things don't die and enable us to learn about this place, many things will die in ways that we don't want to even think

about. So this is a good use for these materials.” And the students always agree.

01:30:17

Livingston:

Did you continue the rule about no artifacts during those dives?

Schmieder:

Yes, that was the rule. But by that time I had a team that was oriented about science collecting and we knew that we were after invertebrates and photographs. So no one was tempted. I actually didn't have to beat anybody up about no artifacts.

We saw them. We would see a lot of filament. Now and then we would see an anchor, we would see a fair amount of lead. Quite often we would only see those things inadvertently. It was covered with anemones and sponges and things. But clearly there had been a lot of debris.

So I started describing this when I would give a talk. I would answer the question, “Do you see any fishing gear or any gear?” And I would say, “Yes, but the Bank is such a vigorous environment that if you leave something there it will get covered in a relatively short time. And as long as it's not toxic or decrepitous or whatever, it'll be okay. It's just become part of the bottom.”

Breaking things is a different matter because very quickly – and it was during that year, 1980, that I first started noticing how much broken hydrocoral we were seeing. And it was an amazing sight to see all this stuff. And at first I assumed it was fish that were bumping into it and knocking it over. But then I said, “Well, fish wouldn't do this. They're smarter than that.”

And eventually I realized it was the fishermen with the fishing technique of feeling for the bottom with a lead ball that was doing the breaking. And I started talking about that and that I talked about all the way through the Sanctuary hearings and the development process, and in my comments here and there that this was a significant effect on Cordell Bank.

Livingston:

So these 1980 dives is when you first started observing that.

Schmieder:

That's right.

Livingston: I became aware of it, at least. The first dive, of course, I didn't see the bottom and there was not much to see in the second dive in '79. The first dive was exquisitely beautiful as I described and I didn't notice if there was breakage like that. I just simply didn't notice it. But in 1980 I started noticing how much damage there really was.

Schmieder: Now, you had mentioned a small National Geographic grant. These dives of '79 and '80 got quite extensive. How were those funded?

Livingston: By and large with the exception of the NOAA Sanctuary Divisions money during – for two years, I think it was '82 and '83, and small amounts of other things which I will mention; this was just a joint self-funded project.

I would make a budget; a rough estimate of what it was gonna cost us. It was Breck for his boat. I didn't try to buy group equipment or expedition equipment. In my subsequent expeditions many years later I budgeted and we would go out and buy tents if we needed them.

But here I kept the budgets low enough – of course, everybody had to take care of their own dive gear, their own food – not the food, the transportation, and so on. And if someone would lose a camera, I'm sorry, we're not gonna fix it for you. It's just the risk you take.

Then I would say, "Okay, here's what we need from you for this weekend is \$40," or \$80 or some numbers. And we would buy the food and there was generally a wife or another person or some of the expedition members who would do the cooking.

So we would make chili or we would make tacos, steaks usually Saturday night on a barbecue. And the budget was just a shared expense. A couple of exceptions, the Geographic grant was all of I think \$1,500 and it was very valuable in the sense that I could put the note on Breck's boat, say, "Would you like to make this vessel available for a National Geographic expedition?" And it got him.

01:35:12

I also had a small grant from the Explorers Club. I think it was \$1,200. Because they have a fund for sort of Junior Explorers. Well, I was not a junior by any means, but I certainly was not a person of Heyerdahl and Hillary's reputation or stature.

So they gave me a little grant, and of course, I was not a member of the club at the time and didn't even think that I would ever become a member because the Explorers Club has serious explorers in it, at least most of them are.

It wasn't until much later that I actually was invited to become a member. But we were very proud of those grants, small as they were. Then when I got to interacting with the Sanctuary Programs Division they asked if I could use some money. And I had a ready answer. And so we figured out how much – and I think it was about \$15,000 or \$17,000 each year, which for us was big money.

By that time Breck was wanting more money for the boat. So most of that money went to the boat. And I think I started using some of that money to buy alcohol, formalin, jars, things that I formerly had just squeezed out of somewhere.

And I think I just used those small amounts of money to get things that I would have paid for myself personally before. But it was a bigger project by then. We needed more things.

Livingston: And that time that you're talking about where you started to get these bigger grants, this is after 1980. Is that correct?

Schmieder: Yeah, I think that was '82 and '83 that NOAA actually provided the funding. I'd started talking with them in '81 or somewhere close to that.

Livingston: So this is the end of the interview on June 25, 2009 with Bob Schmieder, and it will be continued at a future date quite soon.

[01:37:36, end of audio file 2. Begin audio file "CBNMS Schmieder 3" at 00:00:00]

Livingston: This is July 9th, 2009, and we're continuing an interview with Bob Schmieder of Cordell Expeditions, and speaking about early diving and subsequent dives on Cordell Bank. The interviewer is Dewey Livingston, and with us here is also Jennifer Stock from Cordell Bank National Marine Sanctuary. So this, in essence, is part two.

In context with diving Cordell Banks, and your experiences there, how did it differ or was similar to other areas that you've dived?

Schmieder: Cordell Bank was of course deeper than most places that I had been diving, and that members of the group that I was diving with had normally been diving. Sport divers are normally restricted to less than 100 feet of depth, and in depths like that, and close to shore, there's a community of organisms that we're quite familiar with. And so, getting to a place that's far off-shore, 20 miles, and going down from 100 feet to 150, 60, 70, 180 feet, the community, visually and numerically and functionally, of course, are very, very different. But, there were other places that we could compare them with, because there are other off-shore banks, some of which are far enough offshore to be relatively isolated.

So, there's a bank on the back-side of Catalina Island that is visually very spectacular, as we found Cordell Bank to be. In that sense, it was similar to what we had seen on that bank; colorful, abundant, and so on. But, it's tougher to compare it – of course, anything can be compared, but the comparison to, say, shore-line communities makes less sense than the comparison between off-shore banks.

Livingston: Could you name the bank off of San Catalina?

Schmieder: Tanner Bank. And then there's the Cortez Bank, which is shallower. It's off of Los Angeles. Tanner Bank is the other one that I was thinking of. There's a bank, of course, off Point Sur, and we were the first to explore and describe that. And I can tell you about that at some appropriate time, whenever you wish.

Livingston: Comparing your experiences at Cordell Bank with diving off of Point Sur would be of interest.

Schmieder: Well, the first thing you realize is that, even though the Point Sur Bank is a little closer to shore, it's about three miles off instead of twenty miles off, it's still far enough away to be mechanically pretty isolated. So, the community that lives there, as on Cordell Bank, is pretty much isolated. That's why we refer to it as an underwater island. It's insular. The two banks, Cordell Bank and this other bank are about the same size, and about the same depth. The shallowest depths are about the same, 120 feet or so, and they are both – the topography is a very small number of very isolated shallow ridges or pinnacles.

It's not as if, in either place, there's a large flat area that's at 120 feet. These are extremely tiny, spiky protuberances that stick up, and that's where the most dense communities live. This is in common with both places. Also, both places are along the coast, and so they're subject to the California current, which is a southward flowing current. And they both experience the Davidson current during the right time of year, which is the fall, and which comes up and flows the other direction. So, the environment in which these two places – and there are many other places that are similar – are immersed are very similar, so it makes sense to compare them. And we did compare them, because we did explore the other bank, and we did numerically compare what we saw in the communities on those two places.

00:05:10

Livingston:

Speaking of diving at Cordell Bank now, and again throughout the period that you have dived there, could you address the surface wildlife that you saw in the area, if there were any memorable wildlife encounters, et cetera?

Schmieder:

Well, the most memorable one I described earlier in our discussion here, and that was our locating the bank, a diveable place on the very first dive that we made on October 22nd, 1978. We were searching for the shallow place, which we thought we knew we could find. We thought we could find this place, but for hours we searched and searched, and found absolutely nothing diveable. And then, I said, "Well, over there are the birds," and it was Edward Cordell who located the bank back in 1869, by looking at where the birds were.

So, we went over to where the birds were, and sure enough there was the shallow point. Now, that could be partially coincidence, but it's not entirely coincidence. The birds are there feeding on what is accessible to them. Some of them are diving birds, Cormorants, for instance. And their food is coming from the benthic community. So, where it's shallow, the community is most dense. The fish are there feeding on the invertebrates. The birds are there feeding on the fish. And so, in addition, the whales and marine mammals, which have a larger range and will move around much more broadly, are still going to be attracted to where they will encounter whatever it is they consider food.

So, it's the fact that the topography has these shallow pinnacles that are densely covered with organisms, the community. That's what acts like a magnet for the birds and mammals to be located there.

Livingston: And were you able to observe that in the case of whales, or in sharks, et cetera?

Schmieder: The whales tend to range much more broadly, and we certainly saw whales. We didn't actually try and track them or keep track of them. The reason, of course, was that we were busy trying to carry out dive operations. So, we would make note, and I tried, and usually did, have somebody on board who was a bird/mammal person who would keep his or her notebook. So, those records were made, and some of those were incorporated. Steve Cooper and Mark Webber put together a report on the birds and mammals early on. We certainly saw blue sharks quite abundantly. On some days, we would feel we were in the midst of a huge – let's see, what would it be? A herd of – not a herd of sharks, a – a – a something of sharks. And we dived among them. They were not a threat to us at all.

Blue sharks are just fish to us. We would see a few marine mammals. We sighted a northern fur seal. We were able to sight the tag and capture the number on that tag. And that animal was tracked back to its origin in the Pribilof Islands. And of course, they were right there where we were, and we were there because of the shallow places. Beyond that, we were unable to make any more systematic observations. Were they, you know, hanging out above the pinnacles? Or were they ranging more broadly? I just don't know.

Livingston: Do you have any idea if just your presence there was attracting - ?

Schmieder: I suspect so. We found things like the seals to be somewhat curious, somewhat disdainful. Now and then we would have dolphins that would ride the bow wave with us, but then they would, I guess, get bored and go somewhere else. Once or twice, we encountered a whale or two that seemed to be very attracted to the boat. Now, I don't really know – we thought that they were attracted to us. We were whistling at them and saying, "Gee whiz, look at that", and stuff like that. But, I think maybe it was Jenny [Stock] who suggested that they were actually looking for food in the shadow under the boat, which was a good thought, I wish we had

understood that at the time. But, we found them mildly attracted to us, maybe. Nothing obvious. Nothing really to write home about.

00:10:27

Livingston:

To go back to the Big Sur Bank/Cordell Bank comparison, can you list species you saw that were similar, and species that differed? You know, for instance, in one place but not the other?

Schmieder:

Yes. Pretty much, our goal, our task in carrying out the dives, the field operations, was to accumulate a species list, and for me, that was pretty much the invertebrates and the algae. And so, each time we would go out, that would be our goal, is to collect things that we had not collected before, so that we could extend the species list. Regardless of counts, we didn't attempt to quantify how much of this species versus that species. Furthermore, we neglected – as I've just described, we neglected the birds and mammals because that species list is well known. We documented it, and there was one very interesting example of an albatross, and I'll tell you about that.

So, as time went on, we accumulated this species list. The Cordell Bank list got to be over 400, 450 or so. The list from the Point Sur bank – we didn't spend as much time there, but it was a similar kind of collection – and I think the species list got to 186 by the time we were finished. Now, these were species of all of the invertebrates and algae we could see, of which maybe a quarter of those species were algal species. The rest were invertebrates ranging from sponges to tunicates. Probably the largest group was the mollusks, the largest individual taxonomic group was the mollusks, 'cause they were easy to get lots of. Because, we would collect buckets of the sediment, not necessarily live specimens, but specimens appearing in this bucket of gravel that we would collect as representing the population over the recent past.

So, regardless of what the population was of mollusks at that moment, we would have a collection representing, say, the accumulation over hundreds or thousands of years. And because of that, the species list, the number of those species was very high. Jim McLean at L.A. County Museum processed a good part of that material, and was very careful to identify those. So, there are probably 50 or 60 mollusks in that group. There was a surprisingly small – surprising to me – small overlap overall, for all species, between Cordell Bank and Point Sur. There was about a 50 percent overlap, that is the species in common. The biggest and most

obvious is *Allopora californica*, the California hydrocoral. And some of the algae, *Desmarestia*, and others were very common. The *Corynactis*, the little anemone *Anthopleura*, many of these are very common species, and we found them very, very common on both places.

But, when you look at the numbers, how many species – with different named species there was an overlap of only about 50 percent, which I thought was surprisingly small, because of the similarities that I described between these two places. Because of that, I came to the understanding, or I sort of created a model in my mind which is based on the MacArthur/Wilson model of island bio-geography; and I'll give you just the essential basic of that. What that model says is that the farther away the island is from a source, a continent, a reservoir of species – and the smaller it is – the farther away and the smaller it is, the fewer species can be sustained on that island.

00:15:08

So, the count of the number of species is a measure of those two parameters. It depends on those most strongly. Almost no other parameters, wind, sunlight, don't matter. It's how far it is, and how small it is. So, here we have two banks that are not so dissimilar, very, very similar, and yet they have significantly different populations. How do we account for that? The answer is that the island itself, what we should functionally call this underwater island, is not the size of Cordell Bank, five-by-eight miles or so – both of them are about five square kilometers above the 30-fathom line. We should not call that the island. We should call the island something above, say, the 130 – maybe 150-foot depth contour, maybe even shallower, 140-feet, that area is extremely tiny, on both Cordell Bank and the Point Sur Bank.

So, the islands themselves are nowhere near the size, functionally, as an underwater island, nowhere near the size that you would draw a circle on a chart and say, "Okay, it's this big oval, here." Because of that, the MacArthur/Wilson model is consistent. It says, "The smaller the islands are, the fewer species can be there." So, what happens is that if you have a very tiny island, and it's supporting a small number of species, but there is a reservoir of a much larger number of species that could live there just as well if they happened to perch there, then that population will change with time. A good visual image is, you've seen a bird sitting on a post – say, a seagull sitting on a post. Along comes another seagull, flies in, and the first one goes away, and the second one sits there. He now occupies

that post. That's what's happening at Cordell Bank and Point Sur, and many other places very similar to this.

These populations – I use the word “Scintillation” – they are scintillating. It's like starlight. You look at a star, and it's not a constant brightness. It's scintillating. That's what's happening to these populations. You have about the same number of species, maybe 300, or 400, depending how you define your counting method. But, the specifics, 20 years from now – 20 years ago, certainly 500 years ago, 500 years from now, the specific list of species will be completely – not completely – it will be significantly different. Because of that, the recognition of that in a place like Cordell Bank, and now having the ability, or at least potential ability, to monitor those populations over time, to take samples visually or with divers or imaging or submersibles, that's a really critical and valuable function that the sanctuary can perform as a monitoring function to essentially make our observations over and over again at sensible intervals.

It would be nice once a year, but even once every ten years, like a census, would give great insight as to what's happening in the populations. And because this is a dynamic system, managing it properly, as is the charter of the sanctuary, and protecting it, part of the charter, will depend critically on understanding how those populations *scintillate* in time, and how they change in time. So, that emerged from comparing those two banks, those two underwater islands, if you like.

Livingston:

Now, would I be correct, then, in looking at your criteria of islands out there that, then, Cordell Bank, rather than being one big island, is actually a number of smaller islands?

Schmieder:

Yes, and there's actually a whole subject called “Meta-population theory”, the theory of meta-populations. A meta-population is a population of populations. So, if you take, say, one island – take the southeast Farallon Island, and you say, “What lives there?” Well, if it were populated nearby with other islands, and of course there's the middle Farallones, which is – and the north Farallones which is just a rock and a small number of rocks. That becomes a meta-population, and part of the dynamics – and this is captured in mathematical models that are – that are part of what professionals in this field do, they'll set up differential equations for the rate of change of these populations – the populations will move. So, if, say, one anemone, or one mollusk is living on this particular pinnacle, and

not on another, you might say he has existed on this pinnacle, but extinct on that one.

00:20:36

Come back next year, you might find that reversed. So, it's a critical part of the dynamics – it was a very good insight in your question – to understand the detailed topography of Cordell Bank, or the bank off of Point Sur, and to build that into the model, what are the areas of these specific places? What are their distances between each other? What is their relationship to the reservoir, which is the mainland, say, the coast? And all of that has to be in the model. There's some job security there for someone who's really interested in it.

Livingston:

Getting back to your experiences on Cordell Bank, what changes did you observe, year-to-year?

Schmieder:

It was difficult for us to do anything like systematic observation year-to-year. And I have one example that we did do, but essentially all of the time that we were going out there, we were in sort of opportunistic exploration mode. And furthermore, I drove the whole project to be as broad and opportunistic as possible. In spite of advice that we would get from people who had the luxury of –maybe they're studying rodent populations on the desert, and they will take certain transects, or they will take random samples, or grid samples of certain plants. We did not have that luxury. So, I deliberately biased the sampling for diversity. I strove and drove our project for diversity.

There was one case that stands out. We were able, because we were forced – because we ran out of new places to go to, because essentially, in our surveying, we discovered the other four or five places that are diveable, besides the one that led us there, which we called "Craine's Point." We went back over and over to the same places, and in some cases like the shallow ridge on the northeast side, the northeast corner, we became familiar. I have a mental image of what that looks like. I could walk you around it and describe a shelf on the west side, and so on. And so, on one occasion, we decided to – believing that we might be able to see this again next year, we decided to clear – completely scrape clean to the best of our ability, one patch. It was about one meter square. And this was done by the diver with a garden trowel, our standard collecting thing. He just scraped and scraped and scraped, and it all just went away, whatever it was that was there. And I don't actually know what was there.

And we took photographs and documented this bare space. It wasn't totally clean and bare, but it was essentially scraped of any erect organisms. We were able to go back the next year, and rather easily find that place, and document it again. And so, there was a one-year interval – and this is a good example of the kind of thing that could and should be done – we were able to document what would be the first colonizers of that space. What would arrive first? You know we're familiar with forest fires and what springs up. Well, Redwood trees come right up, because they actually need the fire, and so on.

In this case, it was *Corynactis*. We found that square patch almost uniformly and solidly covered with this bright red anemone that's about a centimeter across, the *Corynactis*. We know that *Corynactis* is quite an aggressive organism. It has competition with other small anemones, *Epizoanthus*, and so on. But this is what we found. And so, that was a data-point for us, an interesting observation. Probably more interesting, because it indicates this is the kind of thing that can be done, and so I am able to relate what we did in hopes that, perhaps with sanctuary support or the research community in general, at large, can carry out such things in the future. And I believe that that's exactly what can and will happen.

00:25:40

Livingston:

I would assume that you would need to do a number of those tests, depending on depth and the direction it's facing, or a flat spot, a vertical spot?

Schmieder:

Well, in field science, there are all levels in terms of what you define as, shall we call it, quote, "Good science," or "good research." If you're going to a place that has never been seen before, just observations are really good science. After all, Richard Burton and John Hanning Speke and others, searched for the origin of the Nile in the late 19th century. Just locating a lake, or a river, or a set of lakes as the source of the Nile would be – I mean, that's just an observation, simple observation. No measurements taken of any kind, except maybe elevation and barometric pressure for elevation, or something like that.

We were very much in that mode. It depends, if a person is interested and has the resources, perhaps an indicator species – you might pick the California hydrocoral, *Allopora californica*, because so many other organisms depend on it; they are commensals, or obligate commensals.

So, someone might take an interest in studying that, as we have studied populations off the Channel Islands, I've been part of those studies, systematic studies. I think any scientist who does that is going to have to concentrate on a – one or more indicator species, and define his project. If he wants to see how the *Allopora* is going over time, we will learn that.

That's not what we did in our project, of course, with the exception of the case that I told you about, and minor other observations.

Livingston: Any other changes that you might have observed?

Schmieder: Yes, there is – there is a significant one, but I can't defend, scientifically, that is quantitatively, I can't defend what I'm about to say. Qualitatively, I felt that we saw fewer populations of fish around the places that we were diving. The very first dive, which I described last time in great detail, had so many fish that it not only obscured our vision, it completely covered our ability to see the bank, until I actually passed through the fish, and then suddenly there it was. As the years went on, I felt that we were seeing fewer. Now, that's about all the documentation I can give you. We didn't make any quantitative measurements of it. The photographs don't give any real valid information, although if somebody went through the photographs – we have so many photographs, many thousands of underwater photographs – if somebody went through there, they might be able to examine – or they might be able to pay attention to the fish in the environment around there, and maybe make some rough – roughly quantify that.

It was my impression, only, but it was a strong impression, and I remarked on it at the time, and I've remarked on it since.

Livingston: What was the span of years that you're talking about?

Schmieder: Well, we started in 1978. That was the first dive. And I think it was through 1985, then we made one more dive in the mid '90s, 1995, I think. And so, it was that period. The dive in '95 was a difficult dive. I didn't have all of the same team. We certainly didn't have the momentum and the edge up. So, mechanically, it was harder. And so, the documentation was poorer, and it was well separated from 10 years earlier. So, it was kind of a weak data point in all of that. But, over the time from '78 to '85, I thought the trend was to fewer and fewer fish.

00:30:38

Livingston:

Did you note whether they were juveniles, or adults, or - ?

Schmieder:

Yeah, in the early days, there seemed to be more juveniles. In the later years, it seemed to be mostly adults, and fewer of them. Now, maybe my impression of fewer fish was that there were fewer juveniles. And I can't tell you, for sure. There were fewer fish, perceptibly, and it seemed to be more adults than in the earlier years. But, I've seen the video that was taken with the submersible, by the sanctuary, over the three years, and there are many, many fish – sort of, that evoked the images that we had in the first few years of our diving. So, I wouldn't be at all surprised. I wouldn't in any sense claim that there's a trend toward fewer fish. I would claim only that that was my perception, and that it's probably a chaotic function as most detailed observations in nature are. They are chaotic. Only on broad, statistical grounds are they regular.

Livingston:

Based on your experiences diving there, what kind of questions came up for you – for example, abundance or absence of species, and over time did those observations shift?

Schmieder:

Well, there was one case, and this is a rather narrow answer to that question, which maybe I could speak about the broader issue. But, there was one case that was very interesting to me, in particular, because it serviced my interest in characterizing, describing Cordell Bank as an island. And that was this diatom called *Entopyla incurvata*. It's a very rare diatom. It's rather large. And it's considered a relictual species. It's a relict. The reason is, it's normally a shallow-water diatom, but we collected it at Cordell Bank in what you would call deep water. So, here it was, very abundant in our collections. And in fact, we were able to pass the specimens on to a person with a scanning electron microscope. And we got the first real detailed images, and they're in the book, a full page of those images of that diatom.

Well, the reasons that's such a significant diatom is because, if it truly is a relict, then it apparently is known from only a few places – three, four, five places in the world. What we're seeing is, that diatom has survived on Cordell Bank, even though the water depth – the water is rising now. The bank stays more or less where it is. The water rises and gets deeper and deeper. So, this plant, the diatom, finds itself in deeper and deeper water. And in most places in the world, it just becomes extinct, because it

needs higher light level, or whatever it needs. At Cordell Bank, it did not go extinct. So, is there a reason for that? Would there be some other member of the community there, maybe an alga that this diatom attaches to, it would be an epiphyte, a plant living on a plant. Would it be the abundance of some other algae that would enable *Entopyla* to survive this terrible depth-increasing event? And if so, what is it?

Let's say this is alga-X. Well, alga-X is going to depend on other features, or factors, or parts of the community. Maybe there is some other organism, maybe it's a starfish that preys on this particular alga, or does not, and that starfish is or is not present on Cordell Bank. And why would that starfish be there? Because maybe there's an absence of marine mammals, sea otters, or something, because the sea otters can't survive in that deeper water, but that enables the starfish to. And then, that cuts down on the algae, or some process like that, some chain like that. Well, that's a very rich concept to explore. And that's why *Entopyla incurvata*, that little diatom, in my mind, was and remains so significant.

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We were able to get a loan of the specimens that were collected by Edward Cordell in 1869, as he made the first discovery mapping of Cordell Bank. And one of those, we, with permission, opened and examined the materials under a microscope, to see if that diatom was present in the material that he collected. Disappointingly, we didn't see any, absolutely zero, not one single *Entopyla incurvata* diatom. In fact, we didn't see diatoms at all, which may be because he didn't collect any. He would not have known, of course, because these are microscopic. And more likely was because the diatoms that he collected, being glass, are absorbed into the glass vial that he put them in. So, sadly, our record is lost. It should've gone into polyethylene, or something like that, which he didn't have.

But, that was a – for a moment, a nice possible opportunity to see how – now, and maybe it's significant. Maybe there were no *Entopyla incurvata* diatoms 100 years ago, and there are now, which would raise an even more significant question. How in the world can a relictual species get there if it didn't hang on and hunker down, and be a relict? So, these are really interesting questions.

Livingston:

I want to get back to looking at the Cordell collections, but I think there's a better spot for that. Anything else come up, though, on that same

[previous] question, then? If there were other questions that came-up for you as you were diving that might be of interest for this interview? Even if it's more about the changes through the ten or so years?

Schmieder:

Yeah, there were many organisms that we were familiar with in diving at other places, especially along the coast, that we did not see at Cordell Bank, and we remarked about it at the time. For instance, we never saw an octopus. But, in the video tapes from the submersible, there are the octopus, very, very prominently. It probably doesn't take any leap to explain that. We probably scared them away. We were there in the day time, they like to come out at night. And so, that's not too important. We didn't see any large kelp, and we came to understand from Paul Silva at Berkeley, who accessioned and described all of the algae that we collected, that the light, as a function of depth, is really the critical factor for plants; less so for animals.

But, for plants it's really critical, so the big kelps have to have 100 feet of depth, or less. And so, what we found very prominently at Cordell Bank was an alga that sticks up like a single leaf, sort of like an elongated oak leaf, and it's kind of brown. It's called *Desmarestia tabacoides*, because it's like tobacco. So, we found in a zone from maybe 140 to 160 feet that was pretty common. Below that, was an alga called *Maripelta rotata*. And this is sort of like a little mushroom, but not with a thick cap. It was like a single vertical stalk of a couple of centimeters high, and then a flat disk perpendicular on the end of that stalk. Well, that was a light adaptation. It's red so that it can absorb whatever blue light is available. And it's flat and faces upward, so that it has the maximum projection exposure to the light. And we found that, and that was consistent with the general models of what should live where, and not only where in a longitudinal sense, like up and down the coast and out in the ocean, but where up and down in the depth. The depth variation of these various organisms was a critical part of what we were aware of and trying to document.

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And in fact, in the collections that we made, there are hundreds of new depth records. We collected these specimens, or observed them and documented them, deeper than they were ever known to live before. And that demands – that begs an explanation. And we have a partial explanation for that. So observing these various species and groups of species, and documenting where they were, was all part of this process of

trying to understand what lives there, and why does it live there, which is captured under the title “Ecology of an Underwater Island.”

Livingston: And so, based on what you saw in the shallow spots, did you have assumptions on what the rest of the bank looked like? Did you spend time thinking about that?

Schmieder: Not really. As divers, we had a limitation. We certainly didn't want to dive to 200 feet. We did on inadvertent occasions, and I described that last time with the 1979 dive. But, we had to stay shallower than about 140, 50 – 160 feet, say. And that's really all we were really concerned with. We could document – because, we could look down and sometimes photograph deeper, but as the community tapered off there, the density of organisms, and it became, you know, solitary corals and brittle-stars, and things that are okay living in deeper water, but pretty thin, basically our interest tapered off, because we had no opportunity to document anything there.

We tried very hard to document the very shallowest points. So, on the northeast ridge, the shallowest point was 114 feet or so, plus or minus tide. And we photographed the blazes out of that place, in trying to see what was – and in fact, discovered in the process, that the top four, five, six feet of it is covered with barnacles, not *Corynactis*, not the anemones. You just go down five feet below the top of that ridge, and it becomes very quickly a different community, and the community that's familiar in so many of the photographs. But, the very tip-top of that ridge is solid barnacles that seem to compete successfully for all the space against almost everything else. And that's a significant observation.

Livingston: When you dived there, did you feel like you were near shore in terms of diversity of species?

Schmieder: Oh, absolutely not. We always had the feeling that we were very far away. Certainly when I dived, I – in my head – you know, you can carry on several thoughts simultaneously in your head. You're aware of this, and because you have various senses, I was always very aware that I was way out in the ocean, and that just over to the side over there is darkness and death. And that, of course, is captured in the idea that Cordell Bank is an underwater island. If you move away from it, you die. That's why we had rules for stretching out transect lines. Divers were never ever to go

away from visual sighting on a line, and preferably stay within arm's reach of a line that returns you to the surface.

So, we knew, and we felt that this was very far away, and it was quite different, visually, and of course in the numerics, very different from the shoreline that we were familiar previously from dives.

Livingston: Did you observe evidence of human activity? And we'll get into the holes, so –

Schmieder: *(Laughter)* Yeah.

Livingston: Maybe first, if you saw evidence of marine debris, fishing gear, disturbances, and then let's get into the holes.

00:45:14

Schmieder: Sure. Well, the answer, of course, is yes. At first, we didn't see anything, and I have to say I was surprised. I kind of expected to find anchors, and shipwrecks, and skeletons, and whatever. But, we didn't see anything. It seemed to be just the community, the natural community, the plants and animals that live there; and that surprised me. As we did more dives, and I became more familiar with – and we started looking more carefully, and we started seeing debris. A lot of it was – or very often, we would see the lead balls from fishermen's weight. Attached to that, often, was the monofilament line, and sometimes loose hooks flying around on the ends of those lines. I can't say that it was in – that was really totally wrapped-up in lines.

I've dived a place off of Baja called Rocas Alijos, also what we consider an isolated underwater island, and one of the pinnacles there was wrapped up in so much monofilament, it would have been dangerous to even come close to it. And you can't see that monofilament in the water. Cordell Bank was not like that. Now and then we would see a boat anchor, maybe a fishing pole, some of those lead balls, some monofilament. Not terribly often, but often enough for me to be disturbed, because I would see a lot of broken hydrocoral. And I felt that it was not natural process – it was not fish bumping into it in the night. They don't do that.

To a great extent, this debris was getting covered over by the organisms, by the cover. So, imagine that some fisherman loses his tackle box, and it sinks to the bottom. Well, suddenly there's a chunk of surface that's

unoccupied, and the organisms that live there have no choice. They gleefully jump up and colonize it. The water is just – it's a soup of – they're called propagules. These are larvae, or other, you know, nascent organisms that are capable of growing into an adult large organism, if they find some substrate. Almost all of them don't. They float away and they die. It's an island after all. But, some of them do.

And so, whenever there's a new piece of surface, it gets very readily colonized. And because of that, when you see Cordell Bank on the shallow points, it's not like a desert with a bunch of junk. This is not an automobile junkyard visually, even though I suspect that there's a lot more junk than we would see visually, because it gets covered. Same happens in the Caribbean, or other places where there are coral reefs. You know, the old Spanish ships, to a great extent, have been just completely smothered in coral. It doesn't happen to that extent out here, but it's the same process.

Livingston:

Any other debris that would not have been related to fishing? For instance, something that might have been dumped out of a ship?

Schmieder:

No, I don't think so. You know, the Cordell Bank has been a target for fishermen, sport fishing out of Bodega Bay, sometimes out of San Francisco. And this activity is one of taking fishing lines with lead weights on it, and banging around, and feeling for the bottom, because that's where the ling-cod, and the other rock-fish are. If you were to dump something randomly, probably it would not land on a place that we had access to as divers. They are so tiny. It would fall somewhere else. And maybe the submersible videos, or ROVs if that can be deployed, will reveal those kinds of things.

There was one exception that was really significant to us, but we didn't collect it as divers. We hung around Bodega Bay a lot, and people would talk to us about Cordell – we would try and engage people about Cordell Bank. I'll tell you a little funny anecdote about that after I tell you this. We were sitting at a restaurant having a sandwich or something, and someone came up with a bit of a pot. This was a pottery jug. And said, "I got this on Cordell Bank. What is it?" And we didn't know exactly what it was, but we surmised that it was Chinese, and that it was utilitarian. This was no great museum quality discovery – well, that is, art museum quality discovery. And so, I subsequently took it off to – and found some

experts who knew what they were, and said, “Oh, yes, we recognize this.” This was a jug made in thousands, many tens of thousands, and brought with Chinese when they came across the Pacific.

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And it would contain oil, or perfumes, or other things that could be poured out of this jug. It was about one liter volume jug. And then they would throw it over. And this was one of those. So it – and others, essentially identical, had been found at China Camp, and other places on land where the Chinese had worked.

Livingston:

Why wouldn't it be covered with - ?

Schmieder:

Well, that's a really good observation question. The rate of sedimentation is probably so low over geologic time, it's sufficient to bury things maybe hundreds and thousands of feet deep. After all, that's how we get sedimentary deposits. But in historic time, since the discovery of Cordell Bank, and certainly the incursion of population from Asia into California across Cordell Bank, unknowingly, any items that might've been dropped in the last hundred years are probably just sitting down on the bottom, maybe looking a little dusty, but probably right there; just uncovered and waiting to be observed.

Livingston:

Now, you had an anecdote about Bodega Bay?

Schmieder:

Oh, yeah. *(Laughter)* Thank you. We made our first dive in 1978. And in those years, I was vigorously pursuing any lead about information about Cordell Bank, including anecdotes, and other people who conceivably might have dived out there. Because, we believed, with some justification, that we were the first humans ever to see Cordell Bank. I would be the first person to see Cordell Bank. So, in part of doing that, part of what I did was I tracked around Bodega Bay, and I would just grab somebody randomly out on the street, a fisherman, or somebody in a restaurant who looked like he would be willing to talk. And I would say, “Do you know anything about Cordell Bank?”

And generally, they would say, “Oh, yeah, well – yeah, we go out fishing now and then,” stuff like that. So, this one guy, who was a fisherman, apparently would go out on the sport fishing trips, and he seemed more willing than others to talk. So, we talked for half an hour or so. And I asked him, “Did you ever recover anything? Did you ever pull up

anything unusual?” And he screwed up his face, and he says, “Ah, let’s see. What do you mean unusual? You mean, like, unusual?” I said, “Yeah, unusual.” He says, “Nah, not really. Let’s see, I pulled up a torpedo once. I don’t know, you think that’s unusual?” I said, “Yeah, that’s unusual.” He said, “Well, yeah, we pulled up an airplane, too.” I said, “Well, that’s pretty unusual.” I said, “Well, did you ever hear of anybody else – any unusual things happening out there?” He said, “Oh, my God. Oh, my God. The craziest thing, last year – you won’t believe this. There were some crazy people out there diving.” (*Laughter*) And it had been us from the previous year, but I did not tell him that it was us. (*Laughter*) Whoever he was, I’ve forgotten now, had no idea that he was talking to the crazies.

But, he editorialized. He said, “Oh, my God, those crazy people, I would never dive out there. That’s shark city. That’s where they live.” And I just kept quiet and thanked him profusely for his information.

Livingston: You proved him wrong about the sharks, we hope?

Schmieder: Yes, I think that’s right. Yeah. There are sharks out there, but not sharks that were dangerous to us, that we know about.

Livingston: That’s good. Now, the holes that you found?

Schmieder: Oh, yeah.

Livingston: Could you discuss that?

00:54:45

Schmieder: Well, let me set the stage, briefly, for that discovery, which changed our mental/emotional state. We believed all this time, as I preached to my group, that we were explorers. Every time we saw something, we were the first humans ever to see it. This stimulated the group. This salved my hunger for doing exploratory work, as I described in a previous session. And was a carpet underlying everything that we did. Then, we made a dive on – I think it was 1981 – on the shallow pinnacle that we had discovered, a shallow ridge, on the northeast corner. And what we discovered, and got excellent photographs of, was a hole that was about a meter in diameter, and probably two or three meters deep, and almost perfectly a right circular cylinder. Almost perfectly round, and with a flat bottom. And I instantly said, “That cannot be a natural feature.” Now I’m

aware of potholes, they're ground by rocks. I've seen them many places in Hawaii, for instance. You get a boulder, and it grinds around with the surf. And it can drill a hole. But, that's not what happened here.

The location of this hole was right at the shallowest point on a razor-sharp ridge, right on the razor's edge. Imagine a razor-blade, and now you're going to drill a hole in it. You're more likely to drill a hole, you know, on the side somewhere, or – you know, on an edge, and it's gonna be an irregular, imperfect hole. This was smack on the razor's edge. It was smack straight down, an exactly right circular cylinder. So, as I have spoken and written, apparently, obviously, somebody with a lot of resources and a lot of motivation went out there and made that hole. At that time, we knew of only one such hole.

As we carried on our diving that year, and subsequent years, we discovered more of those holes, including some that were much larger, and much less perfectly circular, but still, to my eyes at least – and it's documented in the photos – in the book there are, I think, six or so photographs – clearly not natural features. These were man-made. What happened to us? The team, after that first dive when we discovered the hole, we just went – we finished and we went home. And a week or two later, we kinda compared notes, and we found that all of us, including myself, had experienced real depression, real pensiveness about this. We were very tentative. We were very unsettled about this observation.

We didn't know what it meant. We didn't know if we were in danger. And we didn't know what to do about it. It certainly violated the concept that we were the first humans ever to see Cordell Bank. And so, as I said a few minutes ago, it just qualitatively changed our image of the project we were doing. So, there was an issue of what to do about these holes, if anything. And there was an issue, and so I'll describe that. Let me take just a breath. Let me just get a drink, and then ask me to take it up again, and I will carry on with this story, because it is interesting.

Okay, so I'm going to now sort of complete, or give you the story of what happened after we discovered the first hole, and how I feel I pieced together what I think is a rational explanation for them, supported by data from several independent sources, which for me, makes it credible. So, after the discovery of the first hole, we were very disturbed. I said we were depressed. We were pensive. We were kind of sad. For me, as

expedition leader, I had a task. The task was to know what it was those holes were about. For instance, one possibility is that there was something dangerous in that hole. I shouldn't say, "Those holes" yet, because we hadn't discovered them all, yet.

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Was there anything threatening in that hole? The bottom of that hole was filled with some sort of debris, but we were frightened from even digging into that, for fear there would be something – something terrible. Now, what could it possibly be? I don't know. That was part of our fear about the unknown. So, I started tracking into every source that I could to try and get some information about it. And I had a friend, Hal, who had obtained for one dollar the tektite habitat, and for a while had it on display down at Fort Mason. And Hal was interested in collaborating with my group to document the exploration of Cordell Bank.

Hal was quite a mysterious guy to me, but he seemed to be very knowledgeable about inside information. So, I asked Hal – I showed Hal a picture, the photograph of the first hole that we discovered, which is the clearest example. And I said, "Hal, do you know anything about this?" And he paused for a very long time. He clearly knew, but did not want to say. But, then he finally capitulated, and said, "Yes, I do." He said, "Those holes were made by commercial divers for the U.S. Navy in the 1960s. And I said, "Any of those commercial divers still around?" And he said, "Yes." And he gave me the name of one such person.

That person was an employee of a commercial dive shop in Oakland, and I instantly tracked off and found him. And his first response to me was, "I can't tell you anything about that." And so, I cajoled, and I – you know, I sort of pulled teeth. I did everything I could to get him to talk, and eventually he loosened up a little bit. And he said, "Yeah, we – several of us commercial divers were contracted by the Navy. And we went out to Cordell Bank, and we made those holes for them to put instruments in." "Well, how'd you make those holes," I said. He said, "With shaped explosive charges." I said, "How many are there?" He said, "There are holes all over." "All over what?" He said, "There are holes all over Cordell Bank, and all over other banks all up and down the coast." I said, "What? You mean this is a big project? What kind of instruments? Were they measuring water temperature?" "Oh, no," he said, "those were hydrophones. They were listening for submarines."

And that's pretty much the whole story that I got from him, but it was very, very credible because of the way he described it to me. I did not believe for one second that he was trying to impress me. He was trying to hide it from me. He said, "I'm legally restrained from talking to you about this. This is classified." I said, "I have a security clearance. I work for a national weapons laboratory. I have a security clearance, and I have a need to know, because I have divers that I'm taking out there. I need to know if there's anything dangerous. Is there radioactive material in there?" And he said, "No longer." (*Laughter*)

And so I felt even more unsettled than I did before, because for all I knew, since this was part of military and defense, and was clearly a clandestine project, that it was possible that there were things in there, even though he said, "No longer" – I think he qualified it. He says, "Not to my knowledge," or something like that.

It was not enough to assure me that these – that this hole, and the ones we subsequently found were benign. I thought, maybe, if we dug into that, we would trip a land-mine, and the thing would explode, or something like that. Now, some of that is in hindsight or retrospect, needlessly melodramatic. But, at the time, I took it all very seriously. So, what I did was, I used resources that I had available to me working in a weapons lab, quietly, to find out where this project might have originated. And it turns out that it originated in San Diego. There's a Navy group, it's called Group-something – Group-One, or something like that in San Diego. So, I drove down there. And I went in the front door with my photographs of this hole.

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And I said, "Good afternoon, I'm Bob Schmieder. I have a group. We've been exploring Cordell Bank with divers, and we have run into a situation that I need your help with. I need your advice on this, because there is a safety issue involved, potentially also national security interest involved. I work for a national lab. I have a security clearance. So, I'm hoping that you will talk with me about it." I'm kind of reconstructing the conversation that I had with the young officer who met me at the reception area. And he looked at my photographs, and he was obviously startled. And he said, "Could you wait for just a minute?" And he went out of the room with the photograph, and he was gone for 20 or 30 minutes. And he came back and he said, "Where did you get this?" I said, "We took it." He said, "You mean you were diving on Cordell Bank?" I said, "Yes.

We're – we're diving. We're exploring Cordell Bank. This is a scientific project. We are describing it." And he left the room, again.

And he came back another 15-20 minutes later, and this cycle was repeated over two or three hours. After about an hour and a half, he came back and he said – and I'm practically quoting him – he said, "I need to tell you that you might not be allowed to leave here this afternoon, today." I said, "You mean I'm going to be arrested or confined?" He said, "I don't want to say anymore. I need you to wait here." (*Laughter*) And I – my feelings were in bifurcation. I was scared, and I was elated, because I knew that, right down the hall, he was talking with somebody who knew about Cordell Bank. And in those days, finding anybody who had ever heard of Cordell Bank was a great triumph, because there was almost nobody. So, I was thrilled that I had found the right office, and I was panicked – not panicked – I was frightened that I was in some kind of legal trouble.

And I was a bit bewildered, but I was secure in my motive, and my procedure. I went to them as a safety issue. I have divers in the water. Their safety is at issue here. And as far as I know, we are legally entitled to do this until somebody else – somebody tells me that we cannot. And after about three hours, he came out and he handed me my photograph, and he said, "Thank you very much, you're free to go." And I went – I did a double-take, and I said, "Well, what can you tell me about the – you know, about this project and what happened?" He said, "Nothing. I don't know anything about it." He said, "You're free to go." I said, "I'm – am I being – said, 'You're going now', is that – am I being sort of ejected or something like that?" I didn't use that word. And he said, "Yeah, you need to leave." And as I walked out of the building, I realized that I had learned one thing, and that was I had not learned one other thing. They were so good.

But, there was even a name of the project. It slips my mind at the moment, but there was a name of that project. Okay, so after that, I went back to my commercial diver and I talked with him. And I told him that interaction. And then, I talked with Hal, my friend with the tektite. And I talked to some other people. And I also did a little more research in the lab's libraries. These were files accessible to me with my security clearance. And here's the story that I pieced together, which seems to explain it. And by this time, a year or so later, we had discovered in our

diving – we had discovered, I don't know, maybe a dozen of these holes, in various places, on various ridges, on Cordell Bank.

And I was told by this diver, that they were in other places. But, we didn't see them in any other places like Point Sur. Although, he had mentioned Point Sur as well. So, here is the story, as I understand it, and I believe it's consistent, and I believe it's correct. During the 1960s, the Department of Defense funded a research program, pilot program, to install hydrophones. In fact, it was a whole chain of connected hydrophones, connected by cables on the sea floor, to listen to traffic out there, including ship traffic as well as possibly submarine traffic. And this is part of the defense of the United States.

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So, there's nothing surprising or unexpected about the military carrying out secret projects. That's what they are chartered to do. They should be doing that. And this is what they did, but no one knew about it. These were instruments that were placed in holes that were constructed for their protection, because they had to be powered by some sort of a power source; not from a cable from the shore, but a local power source for about one year of running time. And the power source was an RTG, that's a Radio Thermal Generator. It's a small, electric generator, powered by radio-isotopes. These are used on spacecraft. How do spacecraft go to Jupiter, and Saturn? They have an RTG onboard. Because the radioactive materials last for hundreds of years, and they provide enough electric power generation to power these.

So, these instruments, these hydrophones, were powered by RTGs. The RTGs were manufactured under contract by Sandia National Laboratories, where I worked. That's how I was able to get access to the information. So, I actually saw the design, the drawings for these RTGs. And this came, of course, in – like I said, independent source of information. And they operated this project for about a year or so, until they – the project – the funding was stopped, and any activity was stopped. The instruments were left there, because apparently there was no motivation to remove them. I subsequently found in the records that they were removed from Cordell Bank on October 21st, 1978, one day before we made our very first dive on Cordell Bank.

So, apparently, the Navy – now I'm inferring something. This is an inference. Because there had been newspaper publicity about – we were

going to go to Cordell Bank and explore it as divers, that was an article that Skip Garretson had written in the *Oakland Tribune* – the speculation – my inference is that the Navy saw that we were going to go there, said, “Wait a minute. We can’t have those guys fooling around with our RTGs that are still sitting out there”, and they went out and removed them, one day before we were there.

Now, this whole story may not be true, but it is consistent, and I deal with data that – and this is my career – when you get data coming from various sources that are consistent like that, it’s much tougher to find some alternative explanation. One day in advance? After 15 years of no activity? That’s more than a coincidence. That strains credibility to be a coincidence. It could be. So, finally, after, you know, all these years of pulling this story together, it seems to be reasonable. It’s not sinister. It seems to hang together. It’s consistent, and it’s all part of a very interesting picture of what goes out there. Sadly, it turns out, apparently, I am not the first human ever to see Cordell Bank. It was the commercial divers, Frank was his name, and the other – I spoke to another person briefly – who were the first humans, actually, to see Cordell Bank. And that’s the story of the holes.

01:15:00

Livingston:

Is there an indication of how many of these instruments were there on Cordell Bank?

Schmieder:

We found probably as many as a dozen, but some of those dozen are poorly – are not as clear. You look at the pictures in the book, those are maybe the most clear examples. And when you look at those pictures, I think it’s quite easy to agree, well, gee whiz, this looks like a set of holes in the rocks. I mean, it’s not an accident. Something happened there, with some – either it was some humans deliberate motivation, or it was God playing – fiddling with us, or something. So, let’s say that there were – you could easily imagine that they tried to make these holes with their explosives, and maybe it didn’t work every time. And so, they weren’t good enough for the Navy. The Navy didn’t like them. But, the one that we discovered first, which was the most clear example, was perfectly placed. Maybe it wasn’t the first one. Maybe it was the last one they made. They finally got it right, or something like that. And so, the Navy said, “Okay, yeah, let’s do that.”

But, I was told, and I believe, that this project was done all up and down the coast as part of a much larger project. So, even though I've never heard of reports of holes on, say, the Point Sur Bank, or Tanner Bank, or Cortez Bank, or these other places, I do tend to believe that the project was done there as well. There are probably the holes there. It's just the remnants. It's the footprint of a project that was sensible at the time, appropriate at the time. But, because of the mystery surrounding it, really caused us to have a significant wiggle, or warp in our psychological and project timeline.

Livingston: About the timeline for figuring this out – did you continue to dive when it was still a mystery?

Schmieder: When we discovered the first hole, I went into concentration mode to solve that, because I was not a – what I told the team was, “We’re not going diving out there unless – until I get an answer.” Are we going to run into something dangerous in those holes? Because, we couldn’t resist going there, but now, everywhere on the bank was suspect. The whole place was a bit of a fright to us, knowing that we were not the first humans walking into a virgin area. We were afraid of everything. So, I said, “We’re not gonna do anything.” But, within a fairly short time, I talked with Hal. I talked with Frank the diver. I talked with the Navy guys. And I started to believe this picture that the project was long ago, that there’s nothing out there that’s going to really be a threat to us. And we went on diving, and we got kind of comfortable, as you do with things. We kind of got excited, and interested, and we were thrilled when we would discover a new hole.

Livingston: Okay. Thank you. Let’s take a break.

[01:18:35, end of audio file 3. Begin audio file “CBNMS Schmieder 4” at 00:00:00]

Livingston: We’re continuing in the afternoon, July 9, 2009. This is the second part of the second session of the interview with Bob Schmieder. Coming back, a few more questions about diving the bank: It’s a fairly large area, but you’re talking about these smaller pinnacles, so to speak, and ridges. Can you give a brief overview of how many of those places you think you dived, some sort of geographical reference? I recall you named one, even. It was Craine’s Point. Is there a way you could describe the places you have dived?

Schmieder:

Sure. The first one, of course, was in the southern – it was in the bottom, if you like, or the southern tip of the oval that kind of just encircles Cordell Bank, and that was a mark on the chart at 20 fathoms or 120 feet. That's where we did our first dive, and we've done multiple dives there, and just to give it a reference, I started calling it Craine's Point for Mike Craine, the skipper of the boat that took us out the first time.

It has a characteristic shape or depth profile when you go across it in a boat with a depth sounder, and it has a ridge. It seems rather flat on the north side. Then it rises up a ways, and then it falls abruptly to a rather flat place. So this profile is easily recognizable, so when we would search for it, we would be looking for that profile, and when we found it, we knew that we had found this place.

The ridge itself is maybe 100 feet long with a profile like that, so it was relatively easy to find in spite of our experience of having such difficulty finding it. Nowadays, with GPS navigation, you could go right there, steam across it, and you would see that profile.

So that's where the first specimens came from that led to the beginnings of the species list. Then after that first success, we spent a fair amount of our time doing surveys, so we would run as straight lines as we could run, which were a little wiggly, looking for shallow places, and we would get a hint about a shallow place, because as I was plotting the position of the vessel, I would notice that we were suddenly off to the side, and then a few minutes later we would be suddenly back on our line again. In other words, we had a little bit of a side shift and then back again.

Then we would come back on an adjacent line or nearby, and none of this was very precise, but it was enough to be recognizable. We would be thrown out the other way, a bit of a shift out the other way. When you stare at that long enough, you realize there is what looks like a high place in the ocean that's pushing you away. It's a mountain or a high barrier, and you're deflecting around it, sort of like a pinball would be deflected off of a mountain.

Well, the water isn't piled up. The water is flat, but the current, when there's a current, the current is being deflected, so the water is being deflected to the left and the right of the central flow line, and the vessel

went with it. So that was an indicator that we had a shallow place, and once we got an indication, we would go back to that place.

We found if the vessel went too slow, we would never see it. We would never get to a shallow place. But if we would run fast enough, maybe six, seven knots instead of one or two, where we were trying to find it by hovering over it, instead we would run across it and, boink, there would be a shallow place.

So once we kind of figured that out, we essentially surveyed on a fairly coarse grid the entire bank, the central part of the bank, and in doing so we discovered a place in the center that was about 22 fathoms that was divisible for us. It turns out to be a rather big, very flat plateau that shows prominently as a polygonal terrace on the bank. Then the shallowest place, which is in the northeast corner that turns out to be about 115 feet, 19 and a half fathoms, and we dived on that repeatedly, and it forms the most characteristic place, and that's where we discovered the first hole that we discovered.

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To the west of that shallow place is another sort of mountain that leaps out of a flat plane and plateau, and we dived on that only once. It's also about 22 fathoms. In assigning names, I think I gave that one the name Tor Hakluyt. Hakluyt was a mapmaker from the 16th Century. Tor means mountain.

And then further to the west is a point which I think is one of the most exquisitely beautiful and interesting places. We did not dive on that enough from my point of view. I wish I could see that more. It is extremely steep-sided and complex. It's like a structure that's been constructed. It seems to jut out. I don't think it actually overhangs, but as we would swim around it, it wasn't simple to comprehend its geometry.

It had ridges, and it had gullies, and it had the rock slabs that overhung this place or that place and big cracks, a really complex place, and among the densest and most interesting of the cover of the plants and animals, and that also was at about 20 fathoms, 21 fathoms or so. Between all of those places, we knew about the first one to begin with and discovered the others, which were subsequently confirmed by the high resolution surveys that Davidson in 1986 and then the even higher resolution surveys done in the 1990s.

Livingston: That parallels, in a sense, a question that we had for later that I think fits now: on the subsequent dives – you’ve explained in quite a bit of detail the first dive, and you have referred to the dives that followed that – could you tell us a little about those dives? So, for instance, were you looking for a particular place the next time you went out, or were you planning to revisit a place you’d been before? How does that relate to these areas that you just described?

Schmieder: Yeah, the question sort of is what strategy would we use to pick targets, and, yeah, I understand your question. It was, shall we say, an adaptable strategy or *adapted*. When we had a scheduled diving expedition, I would have a target, a tentative target, but sometimes it occurred that maybe the conditions were different from those that we expected. So maybe the sea was higher, and we knew that this place would be tougher to find, so we would decide on the spot to go to an easier place to find. Because of the depth profile, we could find it more easily.

Very often or numerous times, we would survey, do surveys, and we would find a shallow place, and we would dive on it on the spot on that day. This happened, I think, with at least two of those other new places that we found. We would say, “Holy smokes, we’ve got a shallow place here. Let’s dive,” and we would do that, and we would do that all in one day.

In retrospect, that seems rather miraculous to me that we were able to get out there, do those surveys, and everybody except myself was sick. I wasn’t sick, because I had a job to do, and it was very tough. The divers had to overcome their exhaustion, their boredom, their sickness, and we would establish a line and carry out several dives in one day. Those were really good days.

Livingston: Is there a way you could describe almost chronologically the dives from beginning to end? Not that you can’t skip one or something, but to give a sense that we started out doing one dive. Then we would do three or four or six dives per season.

Schmieder: Well, what we scheduled was three diving expeditions in the fall, and I think we typically would succeed on two, maybe, of those weekends, three possibly, when we were lucky. On a good weekend dive, we would have

three diving days. We certainly didn't get those all the time. On each of those successful diving days, we would get as many as five teams of three divers in, one after another, one team at a time, and that completed the day.

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And on a number of weekends, we would have all 3 days and all 5 dive teams times 3 divers or 15 divers. In fact, sometimes it was 6 teams, 18 divers, 6 dive teams, 3 divers times 3 days in one weekend. That meant a lot of pictures and a lot of specimens, so very productive events like that.

We didn't succeed in doing that, partially because of the sea state. It's unpredictable. In one case, on one day we had a problem with a diver who had an emergency on the bottom, made an emergency ascent, and I decided to cancel the diving for that day. We came back the next day and had a beautiful day and a very successful series of dives. So that kind of shows you how the statistics of the diving went, and you can multiple all those together, and that's how many we did.

In terms of the flow from the first year to the last year, we started at the 20-fathom mark on the chart that we knew that attracted us out there, but very quickly we got into the surveying. Now, that was 1978. In 1979, we had only one dive team, and I described that before. It was enough to keep the project going, but it didn't produce much useful data, the first photographs so we could say, "We now have photographs," and a few specimens but from too deep to be of any great practical use.

But the following year, '80, then '81, '82, '83, and into '84-'85, those were years where we had the strategy. We had the team. We had plenty of people. We had plenty of equipment. We had a good platform, and we carried out the dives as I described them.

We sort of moved according to my feeling for, "Have we covered this? What's the competition between wanting to go back and see something that we've seen before because it's reliable? We know we could do it. There were more things we wanted to see." That competes with, "Let's go to someplace new that we've never seen, but there's a risk that we will not succeed in doing that." There were just judgment compromises all the way.

Livingston:

And you mentioned '83, '84, '85. How long did these expeditions go on?

Schmieder:

The last in that major series was in 1985, and then we got interested – by that time, the sanctuary nomination was well underway. The species list was starting to saturate. That is, it was approaching sort of a constant list, although if we had worked as hard in the last years as we worked in the first years, we probably could have extended the species list by another 100 or 2 species, 100 or 200 species.

But by that time we were getting interested in going to other places to try and elaborate this idea that Cordell Bank is an island, an underwater island, so the bank of Point Sur was a very attractive target, and in 1987, then '88 and '89, I took the boat down to – by that time, I had my own boat, the *Cordell Explorer*, and we took it down to Monterey and then to Point Sur, and we did our basically the similar kind of series of expeditions out to this bank, collected specimens, passed them to many of the same specialists that we had been passing the Cordell specimens, collecting their identifications, doing our own surveys, and we did exactly the same on that bank that we did at Cordell Bank.

We surveyed back and forth. We got rather good at it, recording depths and positions, and identifying, and we discovered all the shallow points there and dived on all of them, and the description of those points and those dives is very, very similar to the experience and the physical layout at Cordell Bank. They are very comparable. As I described earlier here, they are sufficiently similar that a comparison makes sense.

00:15:15

Livingston:

Thank you. Well, moving along to Cordell Expeditions, could you give us a brief rundown on the formation of Cordell Expeditions as a non-profit entity?

Schmieder:

I described before that when I pulled the project together, we called it Cordell Bank Expeditions. It seemed perfectly sensible, but by 1980 or so, it was clear to me – even though it may not have been clear to anybody else in the project, it was clear to me that what I wanted to do was go beyond Cordell Bank. That is, I saw – once the sanctuary was nominated, that became a project with an end on it. Rather than a lifetime of personal exploration of Cordell Bank, this became – it started transferring the ownership to something else, namely a government entity, so that when the final establishment of the sanctuary was done, essentially I had no more ownership other than intellectual ownership in that.

So, looking toward broadening what it was we were going to do – and what I wanted to do was explore and describe other places on the California coast. After all, we had a great team. We now had a boat. I'm sorry, that was a little later, but we had access to a boat, and we had the procedures, so I looked into and then established a non-profit organization and simply called it Cordell Expeditions.

For a while, I toyed with the idea of forming the Cordell Society, and this is unabashedly a copy of the Cousteau Society. The basic idea is that the Cordell Society would be an organization, a membership-volunteer kind of organization that would go do expeditions to remote places with the driving purpose to describe them, to enable rational management and protection of the resource. That was our charter.

But the Cordell Society as an organization never flew, and just as the name Cordell Bank Expeditions persisted and still persists –things like photo credits and so on, we still see the name Cordell Bank Expeditions. The documents that I wrote and sort of the things that I – sort of the ideas that I circulated about the Cordell Society, once in a while someone asks me, “Well, how goes it with the Cordell Society?” And so the lesson of this is you want to be very careful what you say, because whatever you say, somebody always remembers it and forever.

But it became the Cordell Expeditions, and we completed the exploration and description of Cordell Bank by 1985. Then we went on to Point Sur. We dived at Middle Farallon and a lot at North Farallones and made some discoveries there, and after that, Cordell Expeditions as the sort of umbrella, parent organization was the lead in a whole bunch of other expedition projects, Rocas Alijos off the Baja coast, Antarctica, Easter Island, and so on.

Livingston: You mentioned a dive on Cordell Bank in 1995, so what drew you back ten years later?

Schmieder: Addiction, I guess. It was stimulated by a person who was a very energetic and very competent diver whom I got to know after 1985, after our main interval there, and he was very keen on diving at Cordell Bank, and so I toyed with the idea of going back. After all, there would be really good motivation for going, namely to compare ten years later what we

would see, and I was not so much interested in just the pleasure, and it's a lot of work having fun like that. I was not so much interested in just the adventure of going to dive there. Maybe he was. I think he probably was interested in that, but for me the attraction was the opportunity to make some comparisons over a ten-year interval.

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So we, in fact, prepared, and I pulled some of the same team together. We got some new people, and we went out and dived on Cordell Bank. It was quite successful. We had really good conditions, extraordinarily good conditions.

Unfortunately, because we didn't have the ongoing momentum of a larger project and a larger group of people, the collections were not as extensive or as well documented. The debriefing was not as well done. Did as well as we could do, but I think not everybody really – it didn't have the same character that it had had before, and because of that, the information that resulted from it was weaker.

We were able to show consistency, collect specimens, and so on, but we can't point to it as a source of major new discoveries, and we essentially dived on the one place that we had dived before, the shallowest point, which is easy to find now and the most, I guess, the most interesting at this point. It's certainly the place I took Jean-Michel Cousteau in 2005, when he and his team went to dive there.

Livingston:

By that time, 1995, did you know of other people diving Cordell Bank?

Schmieder:

As far as I know, there is only one other group that's ever dived on Cordell Bank, and that's Cousteau's group, and I was there with them. I've heard a lot of people claim that they've dived on Cordell Bank. My usual response is, "Really? How deep were you diving?" But when they say, "Oh, really deep. It was 60 or 80 feet," I know that they are mistaken. It's somewhere else they were diving.

I don't know of anybody. I've heard stories. I think maybe Jenny related a story of somebody who attempted to dive there but not very successfully, so it may depend on what you mean by a dive. For me, a dive is you get the people down. You get to the bottom. Get their job done. You get them back safely, healthy, and alive, and so on. That to me is a dive.

Livingston: Well, you mentioned diving with Cousteau in 2005.

Schmieder: Yes.

Livingston: Can you briefly tell us that story?

Schmieder: Yeah, it was such a pleasure. It was more than just the pleasure of the moment. It was validation to a great extent, independent of the sanctuary, the existence of the sanctuary, which is a fantastic validation of what we had done. But Cousteau and his group, Ocean Futures from Santa Barbara, was pulling together a video documentary of all of the National Marine Sanctuaries, 11 or 13 of them. So he and his team had been going to every sanctuary, diving, and video documenting this, and it was pulled together as a very handsome two-part, two-hour PBS documentary called “America’s Underwater Treasures.”

So Cordell Bank was one of the sanctuaries, and they contacted me many months before and asked, probably with the guidance from Jenny [Stock] and Dan [Howard] and the sanctuary people, that it might be useful to have me involved with them because of my experience. And, besides, I had been a friend of Jean-Michel Cousteau for many years, anyway. I had seen him, I guess, two years before at a NASA conference in Monterey.

So I got in contact with the expedition leader, Cousteau’s expedition leader. It turns out, ironically, he and Jean-Michel and the others were in the Bay Area with their boat in the early eighties while we were going out to the Farallones. In fact, it was 1986, and we interacted with them on their boat, on the *Halcyon*, and it was still the same expedition leader, so I interacted with him.

We planned to go out to Cordell Bank, and I would go with them, which we did. And so the project, that was successful, although there was a bit of irony and a bit of satisfaction on my part and pride in my own team. The Cousteau people are fantastic professionals in what they do, but Cordell Bank is different from anything they had ever done before, and I think that they had not understood in advance how difficult it is to dive there, even how difficult it is to find the places to dive there.

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I knew how tiny these places are, 20 feet across and 120 feet down in unknown currents that might reverse below the surface. How do you establish a descent line there? And this was far more difficult than any of the other sanctuaries, presented more difficulties than any of the other sanctuaries had presented to them.

So it was very good that I was on board, and they did allow me – and I felt privileged – allow me to set up the vessel and say, “Okay, drop the anchor now,” and this is a technical procedure. I described it in the earlier part of the talk here, the interview, where we can establish.

So I put the anchor right on the middle of the shallowest ridge, exactly where I wanted it. Probably I was ten feet away from where I thought it would be. I actually was quite proud of it, but it was the result of a lot of experience, and Cousteau’s team did their dives. We had to come back another day. The day got too late to complete that.

It took several more days to get the weather in alignment, then a successful day of diving and videotaping, and they stitched it into the program, which is magnificent. So I came away with a great deal of pride in my team, which had been able to accomplish this when Cousteau, as well as they were prepared, still had great difficulty, and they acknowledged that this was very difficult for them. So that was an affirmation that what we had done over those years had not been easy and that we had had to have a really good team to do it, and we did. And we did.

Livingston: Jumping back, I wanted to ask about the situation of getting your boat. Could you tell the story of getting the *Cordell Explorer*?

Schmieder: Sure. I don’t think it’s terribly interesting, it’s pretty straightforward. We had used several boats. We started with party fishing boats from Bodega Bay, and I was constantly soliciting boats, because that was critical to what we wanted to do.

At one point, I connected with a boat in Berkeley, which was a previous shrimp fishing boat, 67 feet long at the water line, and I thought, “This is about the right size for the team of divers.” We wanted to have about 15 divers or so. I was able to come into agreement with the fellow who owned it, Breck Greene, and for quite nominal cost, essentially the fuel

cost, he would take us out, and he did over the years – I think it started in '81 and all the way through '85.

As time went on, I think everyone transitioned out of the early on intense romance into more of a feeling like, “Gee whiz, this is really a lot of work. Do I really want to do this?” This is quite natural in all relationships and all circumstances, and we experienced that, including Breck experienced that, and so the price for using his boat went up and up and up, and I kept saying, “Okay, Breck. Okay, Breck,” you know, and we would go out.

We also suffered a little, because he would bring us up to Drakes Bay and go out in the morning, and he would, what I thought was almost slightly deliberately, run too close to the head, where the waves are always very high, and he would say, “It’s way too rough. We can’t do this,” and turn around and go back, and so it became increasingly difficult to get Breck to do what we needed to be done, and at one point I said, “I’m finished with this. I’m gonna get my own boat,” with a few other words.

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And so I had a number of friends, one of whom had a boat in Bodega Bay. He had several. He had taken us out to Cordell Bank, diving, on a successful dive trip before, Wilson Landrum, and he had this boat called the *NanB 2*, and he said, “Boy, have I got a deal for you,” and he sold it to me for \$6,000.

The seagulls owned it at that time. It was a wreck. I thought it was beautiful. He got it down to the Bay Area, and we spent one full year refurbishing it, almost all new woodwork, took all the electrical out, all the fishing hydraulics, everything off, refurbished it, and boy, did it shine at the end of the year. We took it out to the Farallones, and that’s when I met the Cousteau people out on that maiden voyage, and I’ve used it ever since for either the expedition projects off the coast, down to Point Sur, out to the Farallones, and what I do with it mostly now is I take students out from classes at nature centers on education/research cruises in the Bay Area and up the river. In fact, I have three trips tomorrow, Saturday, and Sunday.

Livingston:

Where is she berthed?

Schmieder:

Berkeley.

Livingston: If you could describe your relationship with the science community and how you dealt with all these specimens you were bringing back, and I think I'd like to actually start that with how did you know what to collect and bring back?

Schmieder: Okay, part of it is easy to understand, because I've already described this is an opportunistic exploratory project. It is not systematic, statistically meaningful research. That takes a different kind of skills and resources, but what was important here was to strive for as great a diversity in the documentation as possible. What is going to be there? We wanted to collect as many different kinds of things as possible, and that was my instructions to the team, and usually it worked well.

Now, how did I know what to look for? I didn't need to know what to look for. We were going to look for and collect and document in whatever way we could anything that we didn't have before. That's the diversity, and so it was not necessary for us to be marine biologists in any sense.

After all, biology now is done to a great extent in a laboratory and has to do with complex biochemical dynamic systems and so on. Here it's much simpler. You see something you haven't seen before. You grab it and put it in your bag and take it home. What happens after that I'll describe in a moment.

For us in the field, it was relatively simple. It was rape, pillage, plunder, and so on. Could we hurt the bank? No, not significant, in negligible, trivial, non-existent harm, and what I argue regularly is whatever tiny amount of harm we ever did is easily eclipsed by the knowledge that we are gaining. That's what we mean by sampling, after all.

So we would come back with, on a successful expedition, perhaps three or four cubic feet solid of materials, already separated and distributed into a variety of jars, typically. We spent a lot of money on jars with black screw-on lids. What we did was we knew enough or learned enough so that we could perform a basic sort.

In no sense did anybody, including myself, attempt to claim that we were biologists or even taxonomists, but we learned enough and knew enough to know what the basic phyla are. We knew a sponge from a crab, for goodness' sake, and so we could separate these into arthropods and

mollusks and porifera and cnidaria and so on, basically the major taxonomic groups, because we knew that, and we either knew it because we knew it all of our life.

00:35:07

Somewhere we learned it, or we were studying the materials that we had, and we had many very fine handbooks. Dan Gotshall has a whole bunch of well illustrated books. [Joel] Hedgpeth's book, *Between Pacific Tides*, was a major important handbook. We studied those and learned enough so that we could perform an initial processing of the specimens.

We would have sorting parties in my back patio, and we would further divide as far as we could, to whatever taxonomic level we could, and we would apply unique numbered labels to each of the bottles or containers of whatever specimens they were. There were a lot of duplicates, and we got to know a lot of the species that are common, like *Corynactis* and *Allopora californica*, the California hydrocoral, and so on.

A lot of these we already knew from our sport diving. Most of them we learned as we went along, and we became rather expert at the common species, and we use the Latin names. We almost never called them by common names, because we learned, you know, *xanthrogranicum*, *Anthropleura xanthogrammica*. We learned these names, and that's what we did.

Then, once that secondary sorting at home, say, was done, I would parse these, parcel these out. I would separate these, send these to specialists, and I used both my personal knowledge of friends and friends of friends, my reading of the literature. I would find people who were the most visible specialists in an area. If they were polychaete worms, I found the person who was the polychaete expert, and I would ask other people, "Well, who knows this category?"

So, for instance, Cadet Hand popped up as one of the experts on West Coast cnidaria. It used to be called coelenterates, and so I would then contact those people, tell them that we were exploring Cordell Bank. "I have specimens. This is from a previously unsampled area. Would you be interested in receiving these specimens?"

"You can keep them and accession them into your collection if you wish. All I ask is for you to give me back your identifications and whatever

documentation and optional comments, if you like, as well as identify any new discoveries. Discoveries would include undescribed species, depth records, range, extensions, and that sort of thing.”

And so I assembled probably 25, 30, maybe more such professional specialists. Almost all of them are well known, were at the time, and many of them still are extremely well known specialists in their areas, highly visible and highly regarded in the community. Routinely I would ship them off, and they would give me back within a few weeks a list of the species with all the documentation that I asked for and the citations and so on, and usually they kept the specimens. They accessioned them into their collection.

So, for instance, specimens went to the National Museum of Natural History in Washington, D.C., this is part of the Smithsonian. A lot of them went to Los Angeles County Museum of Natural History, Santa Barbara Museum of Natural History, the California Academy of Sciences, Bodega Marine Lab, and many other institutions around the country, some in Texas, Mary Wixton at Texas A&M University.

In some cases, they would return the specimens to me after the identifications, and so almost to this day I have had possession of them. I no longer have possession, and I will tell you what happened to them, but the result of all of that was an accumulating, ever-growing list of species identified by professional specialists in their own field.

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All of that documentation was carefully preserved. The names were extracted to form the species list, which I think ended up about 450 or so species by the time I stopped adding to it, and now forms – and we are just in the process of going back to re-encounter or to encounter these documents to provide the fully documented account of the species that were collected and identified from Cordell Bank during that period of time.

And that process worked extremely smoothly. I believe that many of the people were appreciative of the specimens. After all, in some cases there were new species described, and there are all together, believe it or not, more than 1,000 new records. These are range extensions, depth extensions, first observations, new species, new genera, and that sort of thing.

Livingston: Are there any undocumented specimens?

Schmieder: In the sense that are there any buckets that contain things that have no identification, no, there is nothing. Everything had a number, but not everything has been examined in detail, and certainly not everything has been identified. In fact, in many cases, the specialist would say, “Unidentified brown alga.” Paul Silva at Berkeley would say, “Well, I have an alga here. It’s new. He might say, “An undescribed species,” meaning he recognizes it as something he doesn’t recognize, but it’s not yet described in the literature.

So it’s a new species, but you can’t refer to it yet, because he hasn’t described it and may never. There are many, many – you know, there are a million species discovered every year or something like that or 100,000, some large number of new species discovered every year, but most of them are not described. They just recognize them as new.

Livingston: Earlier, you referred to going and looking at Cordell’s collections. Could you talk about that?

Schmieder: Oh, my gosh, what an exciting time that was. It was a period of a year or two years. It was a discovery, I think, as electric as the actual physical exploration of Cordell Bank. I told you that I got my first hint about Edward Cordell from the San Rafael Civic Center, and from that I went to the Bancroft Library in Berkeley and then eventually to the National Archives, and each of these places had some documentation. In some cases, it was the original handwritten documents, say, by Edward Cordell or George Davidson to or from Cordell or about Cordell.

As I did that, every time I would come across something new, it was with trembling hands. How poetic can I be? I probably can’t be poetic enough to capture my feeling at the moment. This process, which historians like yourself, Dewey, know very well, is not only exciting, but it has its own geometry. You may come to a place where you think you are at the end of your exploration here, and yet there is a little crack of light. And you follow that, and you squeeze through it, and suddenly you’re in an entirely new, huge chamber of vast proportions, and that’s what happened repeatedly with Cordell, exploring Cordell’s life.

I would think, “Okay, I’ve got everything there is,” and then suddenly I would find this trove of new materials, and every time I would learn something new, it would be like a birth. Besides going to the archives here, I went to Germany. Edward Cordell was born in the area around Baden, Germany, a town called Phillipsburg, in 1829, and it turns out that there is a state archives in the state. It’s sort of the same kind of state as California, Arizona, and in the archives are various documents relating to not only Edward Cordell but his family, including the report cards of Edward Cordell from his school days.

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So I know every course he was taking, every class he had. I have the reports on his discipline. Was he well behaved? No, not particularly. Did he attend classes? No, he was always absent or often not attending classes. His grades were mediocre to not-so-great, but the problem there was that as he was growing up, he was getting distracted, because Germany was having a revolution. He was getting interested in that, being sort of a liberal student kind of a person, and eventually left Germany and came to America, as I described before.

So the process of discovering that was maybe like the process of discovering the love of your life. The excitement of that is just beyond description, and I know that you know how that feels. That’s the way it felt for me in discovering and sort of bringing Edward Cordell back to life.

Livingston:

Did you say that you actually had physical specimens that you could compare notes with over the century?

Schmieder:

Well, Cordell himself, when he discovered Cordell Bank, collected eight specimens of the bottom. He had a lead called the Stellwagen Lead. This was Stellwagen that he had worked for. Cordell had worked for Stellwagen when Stellwagen discovered Stellwagen Bank out of Boston Harbor.

So Henry Stellwagen had designed a sounding lead, and that had a little cup on the bottom that could capture some specimens. So Cordell in his log records the collection of eight such specimens during that week in June when he discovered Cordell Bank. Those specimens were put into jars and sent to the archives, to the Coast Survey Office in Washington, D.C., and now they reside – at least four of them do – reside in the National Museum of Natural History.

I found those four, or staff there on my request found those four. We don't have any indication of where the other four are, and that's what I referred to earlier when I said for about one year I had loan of those specimens. I had them in my possession, and we ultimately opened one and examined the contents of that one, looking for those diatoms that I talked about.

Livingston: For the most part, were the specimens similar to what you were seeing then?

Schmieder: They were pretty paltry, dried-up little things. Cordell described them in the log as red, slimy things. Well that, now we know, is *Corynactis californica*, the little anemone, and, sure enough, in the jars were a few, two or three, five little dried up pea-like things, and those were undoubtedly the remains of *Corynactis*.

It was, I must say, a little disappointing. When I got the jars in the mail and looked at them, there was just sort of some dirt and dust inside. Of course, that's a totally scientifically incorrect description of what was inside, and to me it was treasure beyond measure, almost, but visually it was maybe disappointing, and someone who is not keyed in at an emotional level with this might have said, "Oh, God, what a crappy bunch of stuff that is." And then it was disappointing when we examined the contents of the one and couldn't find those rare diatoms that were so interesting.

Livingston: So we'll change gears now and ask about your relationship, cooperation, et cetera, with NOAA, National Marine Sanctuaries. So first, at what point did you think about promoting Cordell Bank for conservation? How did you act on that?

Schmieder: In retrospect, it seems so totally natural, but I remember the instant that I heard about the sanctuary program, and I think it must have been 1980, and I was somewhere in Marin County, and I think I came somewhere either to give a talk or hear a talk. And so I was engaged, and I don't remember who it was, but I was having a bit of a conversation with somebody. I should recover that person, because it was pivotal in this.

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He remarked to me, almost quote, “Well, you know, there is a National Marine Sanctuary Program sponsored by NOAA. Do you know about that?” and my response was, “No, I don’t know anything about that.” He said, “Well, you might think about it. Now, that sounds very prosaic, and in retrospect, it was. It was very, very prosaic, but I tracked after it.

Now, how would I have tracked after it? That was 1980. We weren’t connected on the internet. There was no personal computers, so I guess I must have – and I just don’t recall, but I must have simply called some sort of federal government directory information and looked after, tracked it until I found a Sanctuary Programs office, and I guess, sure enough, there was NOAA and a Sanctuary Programs office within NOAA.

And what must have happened, and I’m confessing I’m a little vague on the details here, but what must have happened is that I got their address, and I wrote, because that’s what we did in those days. I wrote a letter, didn’t even send faxes in those days. I wrote a letter to them saying, “I’m exploring Cordell Bank. It’s been suggested that this might be considered as a sanctuary. Are you the right people to tell about this? Would you be interested?” or some generic stimulus like that.

What I got back – well, again, I don’t remember the specifics. I remember that it was surprisingly motivating, because the response I got was, “Oh, yes, we are *very* interested in that.” It was enthusiasm for that, and it was very quick, a very short time after that that we were exploring with the possibility of nominating this place to be a sanctuary.

I mean, suddenly our vocabulary changed. It was as sudden as when we discovered the holes, and we knew that we were not the first humans ever to see Cordell Bank. Suddenly, we were talking about the sanctuary, and so what I did at some point there was I assembled a short report – I think it was 15 or 20 pages – providing the basic geography as we knew it. It was called “A Preliminary Summary of Knowledge of Cordell Bank,” where it is, roughly what’s known about it, our species list, the dives that we’ve done, the history that I knew so far about Edward Cordell and so on.

And apparently it was enough to get them to respond more positively, saying, “Yes, we want to know more about this. Would you consider nominating Cordell Bank to be a sanctuary?” And this came surprisingly

quickly. I was amazed, and I felt almost a little empowered, you know. “Whoa, look, I’m affecting something.”

My response, as I think I’ve told you, was, “No, I will not consider nominating Cordell Bank, because we don’t know enough about it, and I would not want to” – what’s the metaphor? Hamstring? Hogtie? Emasculate? Whatever the verb is – “any such possible nomination by having it not complete,” and I was really serious about that.

So they said, “Well, okay. We’ll talk to you later,” and so sometime, I think, in the next year, they contacted me again and said, “Will you nominate Cordell Bank?” I said, “No, I will not. We still don’t know enough,” and at that point they said, “What would you need to learn enough about it to nominate it as a sanctuary?”

Well, I have to take a little credit here. I was together enough to say, “I need money. We need resources. We have so much we can do but not at zero level. If you can fund us at some level – can you?” I didn’t even presume to say, “If you can.” I said something like, “We would need some funding. Are you in that area? Is it possible?” or something like that.

And very quickly they picked it up, and we started negotiating. I think this must have all been done by letters and maybe some phone calls, although I’m not a telephone person. I’m a written document person. And they agreed to provide some funding for us, which they did for two years running. It was about \$15,000, \$17,000 each of two years, I believe, maybe \$12,000 and \$17,000 or something like that, which when it finally came –

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I remember – this is a little selfish. I remember feeling, “Oh, gee whiz. This isn’t as much as I thought it would be.” Of course, I was very grateful for it, but I worked for a – you know, I worked for a national lab, and I was used to spending big bucks to do government business, and I didn’t realize that things like the Sanctuary Program are chronically strapped for money, and so I thought in terms of government programs. And so I kind of expected maybe \$75,000 or something like that.

However, it was enough to placate Breck, who had the boat, and his rising demand for more money to carry out these expeditions, and that’s what

enabled me to say, "Sure, Breck, we can do that." And, in addition, it provided money to buy more bottles, buy alcohol, things like that, so it really enabled us to expand and flower and, even more than that, to be successful.

We could design the project in such a way that the probability of success was much higher than what we had done before. With zero resources, you suffer a certain fraction of success. With that \$15,000, \$17,000 from NOAA, the success rate went way up, and that's when we were able to collect the large amounts of specimens, have successful dives, and so on, so it was very critical seen in retrospect.

Livingston: What was the date of that first report that you sent to them and then these subsequent grants?

Schmieder: Well, that had to be about 1981 or 1982, and I don't recall the exact date. It's in the documents, which are in the sanctuary office. Jenny knows exactly where those are. Whatever date I applied to that was probably the day I typed it. All those were typed on a typewriter. There was no such thing as a word processor.

Livingston: So who was involved from NOAA that you were corresponding with? And then if you'd continue the story.

Schmieder: Well, not surprisingly, I corresponded mostly with Nancy Foster, who was the Director of the Sanctuary Programs Division of NOAA, so it was her primary responsibility to manage the projected development of new sanctuaries as the sanctuary system was expanded. So I interacted with her in various ways, and she was the one, I believe, who authorized the financial support for us.

For one reason or another, I would find some excuse to be in Washington at least once a year and I always made it a policy to go and go to visit the people in the office there, so I interacted with a bunch of staff people there whose names I don't have at this moment, but one of them was Nancy Foster. I did not see her as much as I expected to and thought maybe I should, since we were the most important project going on anywhere. You get the sarcasm? But whatever the details were that I didn't see, the project went ahead.

That is, the apparent desire, and supported actual realized desire on the part of NOAA to establish a Cordell Bank National Marine Sanctuary was there, and to my surprise, NOAA took this seriously enough to give us money to do something. I don't want to call it official, because it wasn't official yet, but we converted from being a sort of a closed group of people who were just exploring and describing with some vague concept that what we were doing was pushing back the frontiers of scientific knowledge into being part of the bureaucracy of the federal government of the United States of America and having just excavated or exhumed all of the records of Edward Cordell, the records being there because Cordell worked for the federal government.

01:00:38

Suddenly, everything we did, I knew, if this ever happened, would become part of the permanent records of the federal government of the United States of America, would live forever. And so we were no longer explorers, we were part of destiny, part of history. As tiny and unimportant as all of this is, it has those labels on it, and we took that very seriously.

So, I responded as formally and as completely and as well as I could to the request from Nancy Foster and the Sanctuary Programs Division to provide them with whatever information they wanted and to do it – one of my requirements as a scientist – I am a professional scientist, I know what data means, I know how to collect it, I know how to document it and describe it. All of that skill which I used in my regular research and physics was applicable to all of this and ensured the integrity of the data that we got.

I believe that people had the confidence that we weren't over-describing or distorting the records of what we had, that it was genuine. I think the evidence for them respecting what we were producing is that the sanctuary actually came to be, because that initial document, "A Preliminary Description of Knowledge of Cordell Bank," became the sort of core documentation for why Cordell Bank should be protected as a sanctuary. So, both – we did the best we could, and I ensured the integrity of the data. I think they accepted it on face value and properly so.

So, as time went on, to my pleasure and some surprise, there became these other activities. Now and then we would hear somebody else that we didn't already know and was not part of our group utter the words

“Cordell Bank,” and every time I would hear somebody else say the word “Cordell Bank,” I would be amazed.

It would be an astonishment that someone else knew about it, and even in those early days I couldn’t quite come to grips with the idea that anybody else would think it was important, because, after all, Cordell Bank is a little place way out of the way. Who would consider this important?

But then a big event occurred, and that was a bill was introduced in Congress to establish the Cordell Bank National Marine Sanctuary. Now, that’s not the way NOAA normally did their sanctuaries. Those are established by regulation. All of the other sanctuaries to my knowledge in the system are established by regulation within NOAA, and, to my understanding, each of those could be undone if some administrator somewhere – and I’m not making light of this, I’m trying to describe what I understand is the structure – could simply delete one of those sanctuaries off of the list without too great a consequence. An Act of Congress is tougher to get around.

“Well, why did we have an Act of Congress?” I said, and the answer was, apparently, during the two terms of the Reagan administration, not a single sanctuary was designated. Somehow, the SPD of NOAA went into cold storage. Maybe you can associate it with the politics of the Republican Party or something like that. I don’t know what the truth is there, but by 1988-89, there were people, and I will name them, who were getting rather irritated that there were no more sanctuaries being developed.

Well, what was available? Cordell Bank was available. It’s in the pipeline. My original letter that I had written was stimulated by a direct request from – I think it was Nancy Foster, and that might have been 1983 or so. We could check the record on that, a short letter nominating, and it’s a trigger to start that process. So that was five years earlier, and all that time Cordell Bank had been sitting on somebody’s in-basket.

01:05:30

Well, Diane Feinstein, Doug Bosco, a Congressman, and the current Speaker of the House, introduced a bill in the Congress to establish the next national marine sanctuary, the Cordell Bank National Marine Sanctuary, and it was passed. And it went to the President, President George Bush, Senior, who signed it as the first environmentally oriented law in his new administration early in 1989.

The years leading up to that were for me a period of transition out of it. I not only caused myself but I watched myself kind of exit from this ownership, this total exclusive ownership of Cordell Bank. Every time I would say – in the early days, I would say “Cordell Bank” to someone, and they would respond with a blank look. I had the semi-satisfaction out of saying, “Well, Cordell Bank is a rocky bank off the coast of Point Reyes.” And then as time went on, I would encounter someone that I didn’t need to tell that to.

Here is an example that was both sweet and slightly bitter to me, so there is that combination. It was Maxine McCloskey who founded and ran a thing called The Whale Center in Oakland. It was an environmental activist volunteer organization. Maxine not only mastered what it was Cordell Bank was, where it is, and what it’s about, but provided a lot of support and stimulation and education to people, to the public who were needed to support such a nomination to actually bring about approval of the sanctuary. After all, if the SPD threw a sanctuary party and no one had ever heard of the place before, it might have fallen flat.

So, for me personally, I watched these things happen with increasing pleasure that other people were learning about this place and a bit of a decrease, a kind of a letdown, kind of a deflating experience that I was not the only word in town, that there was somebody else who was also worthwhile listening to about the phrase “Cordell Bank.” And that process continued right up until designation. There was a still slightly bitter – not bitter. That’s too hard a word, but a disappointment.

I knew in advance when the President was going to sign the bill, and one of the – somebody, I actually don’t remember who it was who said, “Well, I think you should be there when he signs it.” I said, “Well, yeah, actually, that’s appropriate, isn’t it? Gee whiz. How did this come about? This would be appropriate. The President usually has somebody ceremonially around,” and until the day before, I thought I was going to be at the White House for the signing of this bill.

And then suddenly the connection seemed to break. It was sort of like a radio station going off the air or a phone clicking out. Suddenly, I couldn’t get any response. I would call and leave a message, or they would say, “Well, I don’t really know. Things are changing around.”

I understand all of this in the sense that the President's schedule changes a lot, and they have to do things informally and quickly. I think I also understand it in terms that I was not quite as significant and important a character. By the time it got to the White House for the President to sign, my role, Bob Schmieder's role in all of this, was not terribly recognizable. That is, the Diane Feinsteins and the Barbara Boxers and so on were the personalities associated with this, and I am not ungrateful at all.

01:10:25

This wouldn't be a sanctuary if someone else hadn't taken it up. I was not able to make a sanctuary out of it. I was only able to nominate it and do the field work that provided the scientific justification for it, but the politics had to be done by people who carry around big political hammers.

But, for me, missing the chance to go to the White House to stand by the President of the United States as he signs this bill was a real disappointment, and I wanted that picture to take back to my team to pay them, to reward them for what they had done. It was a small thing, and this is the only time I've ever described my own personal feeling at that. It would have been nice, but it's okay, because look what we have now, this fantastic sanctuary, and so the satisfaction is there even if this particular event was missed.

Livingston:

Did you have any personal involvement during that period when the legislation was being prepared?

Schmieder:

Practically not at all, and it was a bit of a surprise to me that I didn't, and part of it was my own fault for not doing anything, but, after all, I'm a scientist. I am not a politician. I don't think I would have been very good at the politics, although I was asked to come back, and I did go back to Congress, and I testified in front of the committee that evaluated and approved this nomination.

So I had a chance to play the role of a technical expert, which I did. I showed pictures and said why this should be a sanctuary, but I felt outclassed in the political arena. I didn't think I knew anything about politics, and I certainly didn't know any of the players.

To be honest, I didn't particularly want to do that. It's not my interest. My interest is the science, and I did the science well. I did it reasonably

completely given the resources we had, and then my interest waned, and I got interested in going to other places, which is exactly what we did.

Livingston:

Could you describe briefly how your book came to be?

Schmieder:

The book originated in an idea from NOAA, and that was how to reach the public concerning a sanctuary, Cordell Bank, that was so inaccessible. So, what they proposed was that we create a book that would be distributed in public and appeal to a general reader, a general interested reader, and they approached me about the project, and I readily agreed to write the book, and it was appropriate.

And so I did, drafted the original manuscript for the book, and then over some period of time, maybe the next year or so, I think some things changed. Perhaps priorities changed. Perhaps funding changed. I don't really know, but what came to me was that NOAA was not interested at this time in publishing this book, and they made it clear that I had complete rights to what I had written, even though originally it was done under contract, that I was free to do whatever I wanted to with the manuscript.

So I consulted with my good friend at the time and still good friend, Dan Gotshall, about what could we do with this. He supported the idea that we could turn it into a book and publish it, and so I worked for perhaps five more years in completing it, laying it out. I did the entire layout on my Macintosh computer, page layout and finding a publisher and so on and having it proofread by a whole variety of technical specialists. Paul Silva at Berkeley in particular put in extraordinary effort to make sure that every phrase, every implication of the words was correctly done, and then I published it, and now we have copies of the book.

01:15:20

Livingston:

Ecology of an Underwater Island.

Schmieder:

Yes. I might remark with some bragging that my younger son, Randy, who got a combined scientific illustration/biology degree from University of California, did a lot of the illustrations inside of this book as well as this cover, the color cover which, as you see, folds. The front cover and back cover fold out as one large image, and he assembled this, synthesized this from examining literally hundreds and hundreds of our underwater photographs. And it is an extraordinarily accurate representation of what

we saw as divers, maybe a little more colorful than we saw it under most conditions, but it's really quite an accurate representation of what Cordell Bank actually looks like.

Livingston: You mentioned this while the recorder was off, so I want to get back to it. You last dived Cordell Bank in 1995, I understand.

Schmieder: Yes.

Livingston: And did you intend that to be your last dive there?

Schmieder: Every year that we did the diving, we would evaluate whether we were going to do it again the next year. Usually, my team said, "That's the last dive, right, Bob?" and I would say, "Yes, that's the last dive," but inevitably we would come back and do it again.

I will confess here for the first time that I lied. I never intended it to be the last dive. I always knew that from the moment, as I described it for you, from the moment I saw Cordell Bank, the first one second, I knew I would be there for ten more years, and I was. So I humored them in their last dive comments, but I knew I would carry on. It was only when it sort of became a *fait accompli* with the sanctuary that the motivation to go there tapered off, and therefore the team energy tapered off.

The return in 1995 was stimulated by some people who were very eager and very technically competent, and for me it was a chance to return after ten years to observe potential changes that had happened in the bank, but in 1995 I knew with almost certainty that I would not dive there again. The only hope that I still have is that someday I might be invited aboard a submarine so that I could go out and see it again.

Livingston: Good luck with that.

Schmieder: Thank you very much.

Livingston: So we've talked for quite a while here about your overall experience of diving at Cordell Bank. So how does this experience rate with other adventurous experiences you've had in your life?

Schmieder:

Well, a distant second after meeting my wife, Kay. We'll take that as a calibration. You do understand that Cordell Bank was for about ten years an obsession. I was slave to that obsession. There was no way I could not do that. I thought about it day and night.

I was immersed in it. I pulled together and pulled along and pushed and carried the team, not unwillingly, but it was my obsessive driving interest to see this project through to what appeared by 1980-'81 to be the potential for establishment of a national marine sanctuary. It would have been wrong to do anything else.

It was also very exciting. I want to make sure it's clear. We did not do this for the adventure. You can throw yourself out of an airplane or anything else. Walk on hot rocks if you want adventure.

We did this because we believed in the validity of the scientific pursuit. This is field science. It's not field fun. It was fun. It was adventure for us, but that was ancillary to the deeper, wider purpose, namely to document what's out there to support the rational management protection of whatever it is that's out there.

01:20:20

By the time it got to be the mid-eighties, I think my obsession had solidified. You know, living things calcify, and they become solids. My obsession with Cordell Bank has become a calcified, solid thing, not dead, but not going away, not diminishing, not changing, but also not an urgency. I sort of evolved into other urgencies, and we carried out a lot of expeditions to a lot of other places, but it clearly was a life – not a life-altering, a life-swamping experience for me.

Livingston:

How does that experience influence your interests today?

Schmieder:

Well, part of my interest is in what we're doing right here at this table at this moment, and that is capturing what it was that happened then, and for that I am deeply grateful that you have provided this opportunity, that the Sanctuary Program has underwritten this, that you're taking your time so that we can capture that, because not only does it help complete this process and because as a scientist I want this process completed, but also it's helping me to relive the excitement and the interests that we had there.

Right now in my life I'm concerned about other things. I have a startup company involving a whole new architecture for computers, nanotechnology embedded in it, so I spend a lot of my time thinking about that. We're remodeling our house, so my head is no longer filled with the details of Cordell Bank. Thankfully, those details are in the competent hands of sanctuary managers and, I hope, some scientists who would do really good science. I will be thrilled when I see any kind of scientific reports of work or any other data.

We mentioned high resolution surveys. I don't think I've ever had the chance to look at side-scan survey data. I would love to do so, and I would actually love to be involved in research projects. I no longer have the capacity to lead or carry out – I have the capacity – I no longer have the position to carry out any kind of extensive ambitious research program, but it's right there with me every day all day.

Livingston: What image or thought about this experience sticks with you after all these years? Is there any one something?

Schmieder: As I've described before, the most intense image is that very first glimpse of Cordell Bank, October 22, 1978, when I broke through the fish and saw the place, but, of course, that image is compounded or enhanced by the extensive preparation that we had had to go through to get there. So that was partially the same exhilaration that Hillary must have felt when he summited Everest or Armstrong and Aldrin felt when they landed on the moon, and we likened ourselves to that. It was a giddy kind of a feeling. I think that will always remain the one most intense visual, psychological thing or image that stays with me.

There is, of course, Don Dvorak's famous photograph of the rosy rockfish that is reproduced on the sanctuary documents and many other places. That's an image that never goes away. It's become a semi-classic photo, if you like, and, of course, there are literally thousands and thousands of other images that are there.

Livingston: What do you tell your friends or family or colleagues about Cordell Bank today? For instance, how would you describe it to somebody?

01:24:53

Schmieder: I tell them that I am absolutely astonished and thrilled that there is a national marine sanctuary in really good hands and that long ago we did a

project that was tough, and we were tough, and that it doesn't always work for it to come to a good or a productive end. Sometimes, the plane crashes. Sometimes, the ship gets frozen in ice in Antarctica, and the expedition leader has to row over 1,800 miles to get his men rescued and so on.

Here, the process worked, and I was the beneficiary of a good employment situation which gave me vacation time, a sensible salary that gave me money, a great team of people that did it, and then it all resulted in what appears to be a permanent part of our historical environmental culture. That's what I tell people now about Cordell Bank.

If they care to know what's at Cordell Bank, I have a few things I can say, but what I tell my friends is how proud I am that what we did – we did something that led to something. What we did can never be undone, and we hope and believe that what is there now will never be undone, either. So we're part of history.

Livingston: Based on your experiences and what you saw there, what would be your biggest concerns in terms of the use and potential harm to the area?

Schmieder: I don't fear any harm to Cordell Bank itself. Part of it is its natural isolation, insulation, because of its remoteness. I don't think there's any threat, although I may be naïve, and I'm certainly not keeping up with the threats. I don't think there's any threat from somebody trying to drill an oil well out there. The threat of fishermen dropping their lead balls on the bank has been effectively dealt with, and I am extraordinarily pleased that they've taken that step. I advocated it in my comments on the draft management plan when the sanctuary was established, and I was not terribly popular with the fishermen, by the way, in that.

So I think that the threat is not going to be mechanical. The threat is going to be political, economic. It's going to be one of – if there is a threat, it's going to be lack of interest. There has got to be people who care about the national marine sanctuaries, just as there are people who care about the National Aerospace Museum on the Mall.

If people sort of drift away and don't – if nobody is an advocate for the sanctuary system – and they have to be smart about it, and they have to be in powerful places. It can't be just people with throwaway comments,

“Oh, well, we need this nice place.” It has to be people with enough clout to not only preserve the system as such but keep it growing at a sensible rate.

America is founded on sensible growth rate in everything we do, so that means funding at some appropriate level to keep staff on and the important work that Jenny does in communicating, in pulling together, codifying materials and reaching out and so on. I think that that’s critical. What we’re doing here today I think is part of what is necessary to keep Cordell Bank protected.

If I were to be more activist, I would say what it needs is some research funds. It needs some research programs. It needs some scientists. It’s a beautiful laboratory out there. It’s a little tough to get to. There’s a bit too much water around it, but somebody needs to designate some funds to support somebody to do some – look at all these “somes” in here – somebody to study, say, the – say a ten-year study.

Here’s an example, a ten-year semi-quantitative – it could be photographic study, using divers, of the cover. What are the plants and animals that live there? It would be – scientifically, it would be trivially simply. Mechanically, it’s challenging. It’s going to take resources but simply photographing what is there at known control described intervals to see what changes are happening.

01:30:15

Surprise is the most powerful tool of a military organization. If you want to win, surprise your enemy. If we want nature to win, let her surprise us. If we want to win, which means we want to keep on living here and live in a safe, secure, beautiful environment, we need to not let nature surprise us, and the way to prevent that is support these sanctuaries to some extent so that we can observe, collect, analyze the data, and understand what’s going on there.

This, of course, is the charter and the motivation of the sanctuary and the people who run it. It’s just that this has to be done, or we run the risk that the sanctuaries will get old and dusty, and eventually they’ll be moved into the hallway, and finally someone will say, “What’s this for?” and they’ll ship it out, well, metaphorically speaking, of course.

Livingston:

Well, when you broke through those fish and you saw that first view of that beautiful color with the Cordell Bank, did you have any idea that this would turn into what it did, the protections, the national marine sanctuary?

Schmieder:

I did not, because at that time I did not know a thing about the sanctuary program. I didn't learn that until 1980, but, as I've told you in a couple of ways, I knew instantly when I saw that that I would be back, that this was my own personal obsession, and I spoke, and I think I wrote that. I've written that in articles that I've published about Cordell Bank, that my obsession with, commitment to – with the knowledge that we could do it. We succeeded with the first dive. "See, we can do this," and therefore, for me, it was reflexive. "We *will* do this. One way or another, I will do this."

The arrival of the sanctuary option in our project changed the project, and I think, even though from the beginning I believed that if you go somewhere and explore someplace on earth that has never been characterized, you are guaranteed to make discoveries, discoveries never get undone. They don't get undiscovered, by and large, and forever after you are the one who did it first, and that the world has changed for having made the discovery. That was there from the beginning.

The actual embodiment of that in a working national marine sanctuary I didn't foresee, and it was only as it evolved and then when the President finally signed it and it became a reality that I drew a breath and said, "Holy smokes. This really happened," and this was a surprise and a really good one.

Livingston:

Do you have any last thoughts as we're wrapping up here –

Schmieder:

Probably that was my last thought on how I felt, how I felt about this, except that I will just repeat what I said a few minutes ago, how important I think what you're doing is in this process, how effective Jenny and Dan and the rest of the staff are being, and how important you, Dewey, are in capturing this little piece of it, how important it is, because Cordell Bank is an important piece of an important chunk of an important country and an important world, and I'm thrilled to have been a part of that and to have perhaps left a footprint somewhere that might still persist long after I can no longer make any footprints.

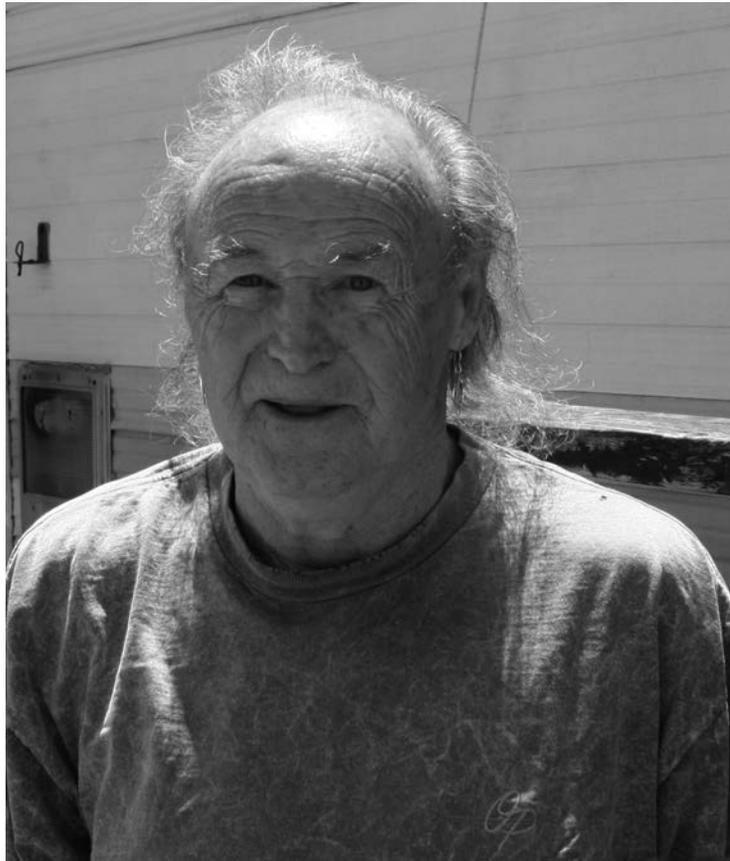
So thank you very much for giving me the chance to share how I felt about this, what we did in some detail, but especially how I felt about this and what it meant to me and, to a great extent, to some of the other members in my group and my team. So thank you very much.

Livingston: You're welcome. Thanks for taking so much time with us.

[01:34:59, end of audio file 4; end of interviews.]

PIONEER DIVERS OF CORDELL BANK
II

Oral history interview with
Harry Sherman
July 23, 2009



Edited Transcript

Interview by Dewey Livingston
with Jennifer Stock

Interview length: 1 hour, 26 minutes

National Oceanic and Atmospheric Administration
Cordell Bank National Marine Sanctuary
PO Box 159, Olema, CA 94950

Dewey Livingston: This is July 23, 2009, and this is an interview Harry Sherman in Redwood City. This is for Cordell Bank National Marine Sanctuary's Oral History Project about Cordell Expeditions. The interviewer is Dewey Livingston, with help from Jennifer Stock from Cordell Bank National Marine Sanctuary.

So the first question is just briefly, could you tell us about yourself, where you came from, and how you got to be here in the Bay Area?

Harry Sherman: I was born in Napa, September 13, 1932. In one month, it'll be my 77th birthday. I was the oldest guy on Cordell most of the time. I went to Napa up there and both my parents worked at the Napa State Hospital, my mother off and on, and my father up to about 30 years' service and my mother about 15.

And when I graduated, I went to work for the state hospital myself, and I was there four years. The last two, I was attending junior college in Napa up there. And then after junior college, about 1955, I moved down to San Francisco to go to San Francisco State. I finally graduated from there in '58, a BA in sociology and half in business.

Never got to my occupation of what I wanted to do mainly because up there my feet ended up claw-foot deformity with hammertoes. And so I've had six operations on each foot over the years of all that caused problem. When I was 15, my hip separated from the socket, so I had a lot of problems with that. Right leg ended up three-quarters of an inch shorter. So I lost out on the physical thing.

Always wanted to be a cop. Even tried for a couple a times for the state for something like that, but I couldn't go into the service. I've been 4F since I was 17. So up there I tried several times for service and never could make it up there or something like that. So after that I was going to college and just working part-time with the Bank of America.

Got married. Lasted a year. *(Laughs)* Didn't work out at all. And since that time, I worked as a special police officer in San Francisco for a private company, and also worked in some bars. Arrested a car fire. The guy kept setting fires in cars. I staked out and I caught him one night doing it. Never got any credit for it. Fire department took over that

because he'd been causing car fires down in San Francisco where he worked. So they solved about 30 car fires.

Later on up there, I worked with a guy up there I met. I was starting to go law school at Hastings. Only went one year. I didn't like it at all. But during that time, I met a guy and we ended up kinda ended up as special deputy sheriff in San Mateo working some drive-ins or something like that, and also the Eichler Highlands down in Belmont or something like that. And up there I even caught a house burn one time, so that's when I actually experienced for arresting anybody. But since that time, after that I moved down to San Jose for a year.

Worked with a guy setting our barricades for construction. In fact, that was the time when 101 was changing from a two-lane to a three-lane up there, so we were covering the entire freeway up there while working on projects, and also there was a lot of building in San Jose for putting up barricades for construction and manhole covers and every other bloody thing.

When I came back, ended up on unemployment for two months. I couldn't stand that. I went to work for a process serving company. So I was serving summons and subpoenas all over San Francisco up there, some of the worst neighborhoods that you can think of, of serving the summons to people up there and things like this. And during that entire time, no matter how bad the territory I was in, I never had a damn bit a problem, (*Laughs*) not one single problem I'd go – and these were the worst neighborhoods in San Francisco, also Hunter's Point, and few other places up there.

00:05:26

But I ended up there a couple a years, and finally I end up working for the post office. And I just retired four years ago after 34 years with them. So my total working time is a little over 51 years, so I got tired. (*Laughs*) And also that last part up there, I ended up with some problems with my heart. It wasn't a heart attack or anything. It slowed down. It started slowing down, and it was making hard to work. And I had one episode, I went into the hospital and they thought they had it okay. Went back to work up there after a week, but week later, I had another episode. They ended up putting a pacemaker in me. So that was –

Livingston:

And how'd that –?

Sherman: Yeah. Put in a couple of years. I hadn't had a bit of problem for it. I've gone in checks three times, and so far nothing has ever happened. And I just decided – at that time I was 72. It's time to quit working. So I left it, retired from the post office. I kept my insurance. Retirement is not that really great. It's not great up there. And my Social Security isn't good because even those all those years I worked – and they took Social Security out – if you worked for the Federal Government, they cut it in half on your Social Security, so mine was cut in half. So I get a little tiny check for that. Otherwise I'm getting by.

But the insurance I kept with my Blue Cross that I had all those years, which is nice because I've had both knees replaced two years ago.

Livingston: So that helped.

Sherman: I've had the both of 'em because my kneecaps completely wore out.

Livingston: Well, what got you interested in diving? When did you get interested into diving? And where did you dive before Cordell?

Sherman: After I got back from – it was two things. After I got back from San Jose, after the year down in all the barricades and everything, and I was working as a process server, I started getting interested in karate and Jiu-Jitsu up there, and I was going up for a couple years and that started in '63. So now I've now had about 45 years of it, the training, and everything.

So there – but also '68 I got interested in diving. Not only been actually in the ocean once on a sea scout trip to Catalina Island, so swimming out there in the water up there like that. So I got into diving, and it was '68 when I started diving.

Livingston: Where did you dive? What type of diving did you like to do?

Sherman: I've got at least 50 dives with Club Hammerheads. San Francisco Hammerheads was a diving club. It originally started out at Giddings School up there, so Giddings was mentor up there a lot of times.

Livingston: Art Giddings?

Sherman: Al Giddings.

Livingston: Al Giddings. That's right.

Sherman: The guy who does all the underwater movies, right? He even came by our club one night and showed his movies he made on the Andrea Doria. And he went on some other movies up there. But the Hammerheads were a lot of free diving, abalone fishing, anything like that. All the entire North coast; covered it from one end to the other.

Livingston: Was there something specifically you were interested in diving like abalone or exploring?

Sherman: Well, at the time up there I got a little interested in photography. We did two dives in Lake Tahoe, and I've got movies from both of 'em. One of 'em was underwater at Lake Tahoe, and the second was a funny movie we made from the beach, which cracked everybody up when it came out.

The biggest part of the thing was that there unloading to go down the beach, had this phony tank made out of papier-mâché. And this girl and guy is unloading the back of the truck, and he's standing out there. And here comes this tank from flying out, banging _____ to the ground. We had things like that all over to make it funny.

00:10:15

And during that time I made at least four or five boat trips out of San Diego, Los Angeles area. Dove along the Channel Islands mostly. And also during this time – I guess it was about the same time – I could look it up here. Just a second.

Oh yeah, it's also in October '72, I took the NAUI course down at the pool in Palo Alto up there, and that there – and the swimming, I got through everything. Every single test they threw at me, I made, even though it practically killed me. I made it even in the long swim because I'm the worst swimmer in the world. In fact, I'm the only guy in the world who can lay in a pool, put a paddleboard on, kick like crazy, and go backwards. So my kicking is completely fouled up or something like that.

But I took the NAUI course up there, and I screwed up on the written test, so I flunked – they flunked me out up there. Two questions up there – one of 'em was on artificial respiration. I'd gone through every single Red

Cross training course there is, from first aid to instructor, from swimming to instructor, and everything like that. And at the time up there, they weren't using the breathing method. Red Cross was not.

So I go down there in NAUI, and they put on the thing of, "How many breaths do you take?" and, "How many pumps do you think?" I didn't know a bleeding thing. That was one of the questions that screwed me up. But anyway, a friend I went to the school with, got a job as an instructor, scuba instructor, at San Francisco State.

So in '72, I was his assistant. So we went through all the swimming and trying to think of all things to – we went for it was about a three or four-week course. We couldn't think of anything else to throw at the people who we made several dives and Monterey, and also in the north coast and few other things like that. That was one of my big experiences of there.

Lake Tahoe was up there. '75, I made a dive in the Bahamas on a three-masted schooner called the Phantom. It's a ship they'd hire out for diving take 'em from the time they go from island to island, or something like that. Got a movie out of that one, and also, '76, I dove Baja, ten days on a trip down to Baja on a boat, living on a boat. So I dove all over the southern part of Baja, California up there.

Let me see. '76, Cayman Islands again. This was another boat trip, ten-day boat trip or something like that. In '77, later that year, I went through Washington and British Columbia. A friend of mine who's originally from Washington, we went out on a diving trip. We practically dove the entire Washington Coast and all the way up to as far as the road goes in British Columbia and did some diving all over there up there. That was interesting diving or something like that.

I'm trying to remember. Another trip or two down to here, Channel Islands or something like that. Let me see. Where do I – a couple of other boat trips. '83 Kona. Friend of mine had a timeshare apartment over there, so she lent it to me for one week, and I went over there and I dove on the boat out of there – it's just a small boat, but they take you to the most interesting places.

They say if they can't take you to a place where you spend an hour underwater and not get bored, they don't go there. And up there, this was

– I swam into a cave where about – reef sharks were swimming around and they're passing by you back in fourth up there. And another one was lava tube up there. One other guy – we were two experienced enough, so he took us up there, and we're crawling through the rocks and all over in little tiny, tight spaces. And we come to this one place that just blew your mind. It was a shelf. It was only about this high and was about maybe 20-30 feet long. And inside were the largest puffer fish you've ever seen in your life.

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There were about 20 of 'em in there in that one little spot. That's the only spot they ever found up there that these things hang out at. It was interesting dives up there. I had a great time.

Livingston:

When did you first hear about Cordell Bank?

Sherman:

1968 [1978]. Bob had his first dive in 1968 [1978]. He started in '77, and they made that one dive in '68 where they found one pinnacle by accident and everything, and then they got pictures and collected of samples. In November of that year, he came by the UPS meeting, Underwater Photographic Society in San Francisco, and he gave a lecture on that. And it intrigued the hell out of me.

I was the only one out of that meeting who ever came to one of his meetings or anything else, the only one, and up there – and that was it. That was when I got interested. It was November that year.

Livingston:

Had you heard of Cordell Bank before that?

Sherman:

Nobody had ever heard of Cordell Bank before. In fact, is what you do up there when Bob described it, it's 20 miles out to sea, and you go down 150 feet. And this is – people in UPS looked at anybody – throughout the entire time we dove there – looked at us as complete idiots. They did not take us for granted – believe us or anything.

And when we told 'em stories of going down and diving 150 feet and you saw red and yellow, nobody in the world believed it till they finally proved it, that this actually happens down there. But nobody believed us. When I – this is – I got notes up there of theirs.

The first meeting we ever had I went to was in March of '79 up there.

And we did a March and an April up there meeting. The first diving practice we did was in June of that '79. And what we did was the time up there is getting a whole bunch of together to go down to Monterey, find a deep spot. We finally got to about 80, something like that. And we had this time-lapse camera. Lee Tepley had a time-lapse camera. It set on an A frame this tall, bars on each side, frame. And this camera, which is about this size, just hung from it. And it takes pictures every second, or something like that.

And we were going to use it on Cordell bank, and we took it out there, and we had a hell of a time trying to get this thing organized and everything. Before we even went on this dive, Bill Kruse, who was another member down here, lives right down here in Palo Alto, he took it home to his house and was trying to figure out to make it work. Something was not quite right.

So I went down there one day and he's working on the thing up there, and I go down up there. And we're playing around with this thing. And no matter what he does, it doesn't work. And I made a mention. It says, "Why don't you turn this thing around, the way it doesn't go?" It worked perfectly. So when we took it down to Monterey – this was on a dive up there – we set the thing out there, takes pictures. Then we went out to dinner.

Finally around 9 or 10:00 at night, we go back to pick it up. This is the night dive up there. This dive finally ended about 12:00 or 1:00 in the morning. We did get pictures up there, actually up there, the pictures up there. And it was a starfish crawled inside an anemone. Those little tube anemones, he crawled inside of there. We got this picture of him doing it out there, and that's about the thing that ever came of it.

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We finally decided, "This is too much trouble to do anything with." We made a few other practice dives up there at – let me see, in August, early, one in September when we practiced putting out a transect line.

Livingston:

And those were all not out at Cordell Bank?

Sherman:

No.

Livingston:

Your practice sites were Monterey –

Sherman: All these practice dives – this is the first time have we ever got together and tried to do actually just something underwater and a few things like that. Now is what I want you to do is stop for a moment, and I’m gonna have you go back.

Livingston: Could you tell the story then of that dive?

Sherman: Well, 10/10/79 – I’ll tell you the truth. On all these dives, I wasn’t even mentioned in the film, right, even though I’m filming, right, because I was just an added passenger. I talked myself into going even though – there. And this is a – I’d say most of the dives, I was not a particular member that I had to be on that boat or something like that. Most of this time I was just a guy that was sitting around who helped everybody else get ready for their dive and everything like that.

And when I got in or something like, I’d try some of my video or film that I had at the first time up there until my camera was complete – I ruined about three cameras up there during this entire time up there or something like that for the whole time up there. So I was really not a major member of this whole thing.

Like, Tom and Bill were always the first. They’d go down, set the transect light and everything like that. That was their job. That was their main thing. Bill took a lot of photography, so that’s why you see a lot of pictures of Tom in it because Bill took all those pictures up there like that.

Plus the other thing, the others, Sue Estey and Don Dvorak are great picture takers, and a few other people like that, but I was never really the major person in this thing. I’m the guy that came along. I was there all the time and the thing like that. But after that dive on 10/10/79, Bob made a decision. And so up there – we started going out on boats.

We were doing about five or six trips. We did nothing but drive back and forth, back and forth, back and forth, back and forth. And we write down the Loran readings constantly, the depth readings constantly, back and forth, back and forth. We did this on several trips. And it gets boring out there doing this thing like that. But that’s how we found the pinnacles before we’d go out and dive on ’em again.

Now during this time, there're two little stories I'll tell ya. First one is up there is – let me see, on – December 30th. Let me see, yeah – let me see. Let me have – well, yeah. This was about '80, something like that. We brought a boat up there and we were gonna do some diving, a fishing boat some guy from San Francisco brought up there, brought it up to Point Reyes.

When it got up to Point Reyes, he came up there later. He was having trouble with his boat, or some engine, or something. And he came up to the dock and we were standing there, waiting up there for him and everything like that. And we was a little – starting getting frustrated trying to dock there because the pier was high at the moment. And this is where the big joke came when he said, “Would you throw down a tire?” And Tom Santilena leans over the top and says, “Radio lindias pligue,” which cracked everybody up but didn't make the boat happy or anything like that.

But anyway, up there, we decided to load the boat anyway that night, so we loaded it up so we'd be ready to go in the morning. We come by in the morning and the engine is not running, does not run at all. And so John Santilena was sitting there trying to get this – find out what's going in the engine. And he's sitting there with the engine. The only way you can keep it going is by using a spray on the carburetor to keep the engine going because there was little – find out there's little air in the gas line.

And here's my little dog. This is Soosie. And I went down there next to John, and I'm sitting down there. My dog's on my lap snapping at flies that are flying around there. We're sitting there with this air in his gas line. We can't keep this goddamn engine running. And I'm sitting there, and all a sudden I look over to my side over here and see this little air filter. I reached over and turned it. It was loose.

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Turned it, the engine started running perfectly. Air disappeared from the gas line, but we can't go anywhere because it's too late for diving or anything. This guy wants to go home. So we find out there he's having trouble with the intakes, too. So I made the only dive at Point Reyes dock to clear the seaweed out of the air intake, which I wasn't very happy doing the dive, but I had to go down there anyway 'cause nobody else was about to. But that was one big thing up there.

Another thing happened, too, is my small dog – the piers up there on one morning. I'd drive up there at night. I had a pick-up truck with a shell on it and I'd sleep overnight in the thing on the thing to get an early start in the morning. And I'm getting up there about six o'clock in the morning. I wake up. I take my dog out for a walk. Another guy was there, too, and so we're walking. Walked out on the pier where the boats are docked, and my dog walked off the pier. It walked off the pier into the water, fell about six feet up there. And all I see is this little tiny dog paddling like – with his eyes wide open. And I try to call him, but the echo, he couldn't tell which direction I'm coming from.

So I had to jump down, strip off my clothes, and jump in the water and go after him. And that's where I discovered how cold the water is. Because you know they say you hit cold water and it sucks everything out? That's exactly what it did. I only had to swim a short distance to my dog and pull him back in, or something like that but it was one of the most tiring swims I ever had in my life. And it was so cold. It's foggy. It's dark. It's cold.

I go back to my pick-up truck. I'm standing there in my shorts and I'm warm. That's how cold the water was. I was warm. But that's another trip on the things up there, going back and forth all the time.

Livingston: Now was that at Point Reyes at the fish docks there that you're talking about?

Sherman: Yeah, Point Reyes fish dock. Most of the time we went to Point Reyes up there or something like that.

Livingston: That's your stop-off point or it's your staging point?

Sherman: It's the stop-off point – no, so up there where you spend overnight. When we go back there, we come back all the way to Point Reyes and do the anchorage up there, because you just can't anchor outside or something like that or just float around all night.

Livingston: Can you tell about your first dive down to Cordell – are you ready to tell that?

Sherman: Yep, yep.

Livingston: And while you're looking there, I'm taking it that then this 10/10/79, you don't dive, right?

Sherman: No.

Livingston: And that's the one where they found that their anchor wasn't in the right place?

Sherman: That's where we needed to find a pinnacles, and that's why we did all the boat drive back and forth and a few other things up there.

Livingston: Okay. So your first dive?

Sherman: 9/14/80.

Livingston: Could you describe that in as much detail as you're willing to go?

Sherman: It's going to be a very short dive. (*Laughs*) Here's what happened. I dove with Don Dvorak and Sue Estey. I was the first one down. Don was behind me and Sue was the last one down. Well, this was their first time on Cordell Bank. She didn't feel good, so she went back up. So Don and I are sitting on the bottom looking around at Cordell Bank. I'm gonna get my camera ready and start shooting, or something like that.

And we look around. We're looking all over the place. Where's Sue? We have no idea where she is. So what do we have to do? Go back up. So my first dive down there, even though I had a view and everything, saw all the fish coming down – when you dive Cordell Bank, when you come down there, you first think you're there, but it isn't. It's a school of fish, just large blue fins – little fish up there. It's a large school of 'em. You just have to swim through them.

Then you swim through the smaller fish that are on the top of the pinnacle. Then you finally get to the pinnacle. So it takes a while to get down up there going this deep. But Don and I both had this short dive. So we came back up. So that was it. Even though it was beautiful and I loved it, we made the only honest decision to go back up, because we didn't know where she was.

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Livingston: So what were your impressions of that first look of Cordell Bank?

Sherman: Beautiful, gorgeous. I've told this to several people before they go on their first dive to Cordell Bank. You're gonna go down there, and you're gonna come back up and you gonna tell me that Carmel, Monastery [Beach] is a desert. And that's exactly what they say. You come back up, Monterey just does not even compare to what you see. There's so much life down there.

That cover of the book that they did on – I said on my last dive was it looked exactly like that. And most of the time it looked like that. There were few places where there was just rocky places or something like that. And there's one dive which you'll – especially see, especially in this other film up there, of how the rocky part of it here, and the holes that we found, every single one of 'em.

The second dive was 10/10, believe it or not, 1980, comes up October, those great days. And this was off the Landrum's boat, too. We went down there, got to 160 feet. I got my movie camera out. I'm sitting down there and I'm happily filming along for something. And after a couple of minutes, Bob comes over, taps me on the shoulder, and goes like this 'cause what he did was he went down there and he didn't like the way the anchor was sitting, so he tried to move it. And he spent a couple of minutes there trying to move this bloody anchor, and ran out of air.
(Laughs)

He was running very low out of air, so is what happens up there. I had to go back up again, right? This would – both two dives on there were short dives. Still beautiful because I was sitting there. I was enjoying the scenery up there with my camera and everything like that, but it was both short dives.

Livingston: So that second dive, who was involved with that second dive?

Sherman: Bob Schmieder was even there when, I don't remember who the other guy was at the time. In fact, I don't even think I wrote it down in this dive log up there, this covers all the – practically everything. You don't even get over to here before you get to Cordell up here, up there.

Livingston: So on that dive that you were pulled up by Bob, did you do any data collection or –?

Sherman: No, I was all filming. At the time up there, my movie camera was working fine up there. It was only on a later dive did it broke the lens on a decon lens, ruined camera. So it took me a while to get another one up there, which I still flooded on ruined another camera. But I did gets a lot of photography off there most of the time.

Livingston: So was your role mostly taking movie footage?

Sherman: Yeah, movie footage of something like that, or video later on, or something like that. But that – and also is what Bob said is every time – I don't know if you've ever seen his collection of reports that he made every single year after that thing. He says, "If you don't write it down, it ain't there." So that's the one the thing he meant. When you came up from a dive, you wrote everything down that you could possibly remember. And that's – I've got more of that in those books than I do in my logbook, or something like that.

But there was – '81, made five dives, and during this time, a couple of times was that we'd be wiped out. We'd make a long trip out there and you can't dive either day, and you come back. There were several of 'em like that. One time we went out there, started to go out there and Pisces had trouble with the boat. We had to turn back. We couldn't go out at all.

One time we went out and he ran out of gas. (*Laughs*) About halfway to the Farallones, or something like that, he ran outta gas. And we haven't even started yet, so that was one long day, or something there – that was an experience and a half, because is what happens up there, the Coast Guard took a while to find us. We kept giving them Loran readings, but they didn't know what the hell they meant, so they couldn't – took us a while. Finally a cutter came by and started towing us back. Halfway back the line broke, they had to do it again.

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We came into the Fisherman's Wharf and we're docking along side there. And the skipper of the boat didn't know – he needed to pull the boat in and pull the back in this way. And the guy says, "Port, go port. (*Shouts*). Where are you going? Starboard." And during this time, Bob had these long bamboo poles with a flag hanging on 'em. Those were the marker buoys used at Cordell Bank. I kept one of the flags.

Livingston: “Cordell Expeditions.” Yeah. Oh, that’s great.

Sherman: These were on bamboo poles, and so half the bamboo poles got crunched next to the pier because this guy’s – this Coast Guard skipper didn’t know which way he’s going. We spent the night at wharf there. Next morning, I had to – the only – I was the only guy who knew San Francisco, because I’d lived there for a while.

So twice I had to go find a diesel station – it was out by Hunters Point area – and get a couple of cans of gas of diesel fuel because it was the only station around that sold diesel fuel at the time. And I had to make two separate trips to get diesel fuel to get back to the boat so we could run back to Berkeley so we could go home.

So a lot of these trips like that were like that. One of the best – two examples. One up there, when we were doing the survey of the lines, one of those trips the water was so flat. I mean, absolutely flat. In fact, it was so flat that every time we went across the pinnacle, there was a slight movement in the boat because of the current, or something like that, or a difference in the water temperature or something. Not a big difference, but it could be felt, especially the guy who’s up there steering a boat up there. All of a sudden his wheel goes like this.

But during that time while that water was so flat, I looked over the side, and here’s this seagull swimming along and left a wake 30 feet behind him. That’s how flat it was. I don’t know if you’ve seen a Plexiglas thing Bob made of the scroll that was made that day. You could see the pinnacles. They’re just close together up there. He made a three-dimensional thing out of it, but it came out beautifully.

Another time up there in initially on Cordell was we – oh, they’re two times up there. I – yeah, the first one up there was we went out, and it was a little bumpy out there, and we’re not sure if everybody was gonna dive or not. But Bill Kruse, Lee Tepley – I can’t remember the other guy – were going down. And Lee Tepley sat on the boat and was going backwards and banged his head on the way down, so he had a slight headache or something.

They got down to the bottom and the current was so bad, they just couldn’t do anything, so they canceled the dive. Bob Hollis was on that

trip up there, and some other guy – I can't remember who. He was famous, or somebody, couldn't remember his name. But when we came back, they decided they didn't like this. This is too rough; can't do this. Bob Hollis stayed overnight, parked at Point Reyes.

Go back out the next day and it's practically flat. There is practically nothing out there. Everybody got down. Everybody got down and Bob Hollis loved it. Said it was – he would give us some equipment later on another trip, _____ helped us out. But he thoroughly enjoyed up there. But this – the change in the weather was just absolutely amazing.

Livingston: Did you notice other changes from one dive to another down on the bank?

Sherman: No. There was only one time, which I'll tell you about in a little bit. But I want to tell about the other experience up there. We were on Breck's boat and we were going out, and almost got run by a tanker just before we got to the Golden Gate Bridge. He passed within five feet of us. I don't know whether he had any radar or not, but he's just floated by us or something like that.

And during rough times of the weather, if it got a little rough, you'd follow the fishing boats and they'd go along the coast. Instead of going out, they stay along the coast all the way to Point Reyes before you go out. Well, we were out there one day and we were going out there. Got to Point Reyes and we're going out, and it's rough waves, and this is automatic steering.

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So I'm sitting up in the wheelhouse, and I'm sitting there watching these waves, and we're bouncing around a little bit. And all of a sudden one wave came this way, one of 'em came this way, and one of 'em came this way, and hit us. I just looked at those things and I yelled – I turned around and yelled at the back says, "Hang on."

And Breck has always got seasick. So he's in his cabin. He's always got seasick. He was throwing – every single time we ever went out in a boat, he's seasick. So everybody else steered the boat, practically, except when we were on the bank. Then he was alright. He had a can up on the pilot bridge, heaving into it all the time.

But we hit that bloody thing, and everything in the back – it sounded like

somebody opened a closet and everything fell out. It was just a mess. And Brett comes roaring outta there, and he said, “Where the hell are we?” He immediately turned the boat back. We went back to Point Reyes. I think we made a dive the next day, but it was a little rough at that time.

Livingston: So am I right then that you would go up and settle yourselves in at Point Reyes, so to speak, and then go out for a number of trips out from that one trip?

Sherman: Yeah, or we’d go straight out. If the weather’s nice, we’d go straight out. A couple of times it wasn’t. You’d be bouncing all over. There was a couple of times you’d get wiped out completely. That happened also on the other dive down in Schmieder Bank. They used to get wiped out and we couldn’t go anything.

Livingston: How long would you be prepared to stay up at Point Reyes for attempting to dive? Three days, five days?

Sherman: No, it was only a two-day dive. It’s always the weekend or something like that. It was never a three-day thing, or a four days, ‘cause most everybody worked. I was still working. I had to get back to work. Everybody had to get back to work.

At the time, I had Saturdays and Sundays off while I was working for the post office. I was inside doing – well, all the time when I was in – so I had Saturdays and Sundays off, so I could do it no problem. A lotta people couldn’t. So if they’re – that’s why dives were so different of who you’re diving with, or some – but most the time, I dove with either Don or Sue, most of my dives.

And what happened down there at the bottom, there was a couple of memorable dives. One of them finding the holes. One time somebody had taken down a big brown pipe and was gonna bang into it, see if you can select any sediment. I was set down at the bottom of one of these holes banging on it and it just sounded like you’re clanging – hitting it with a hammer. Bang, bang, which we found out later up there, the Farallon Islands, the entire Cordell Bank is nothing but solid granite.

And it came from L.A., (*Laughs*) millions of years. It keeps floating up.

The entire chain up there is entirely solid granite when we did the survey for the geological survey. They couldn't ever get samples off the rock because they couldn't drag anything. There was no loose rocks. So that's why we went two days down there banging on rocks to pull it back up there.

(Whispers) Fantastic diving, Farallon Islands, the upper islands. Fantastic diving. But the other thing, most of the diving up there – one memorable dive was there is – I'll always remember it. It was a sort of a rock face like this, and there was a deep channel into another rock. And on top of this rock's face was a coral that big [*indicates about 2.5 feet with hands*] sitting right on the peak. And down in this valley, sand valley down here, must have been 20 lingcods just sitting there.

Livingston: You don't see those too often.

Sherman: You don't see those, no. When we dove out there, I've seen – I'm trying to think of my whales, humpback whales. In fact, one time while we were doing this survey up there and two of 'em swam underneath the boat, came up real close to us. The guy was a different skipper than Tom Landrum, but he said he could attract 'em. So he has this little flute. He gets up there and he starts playing it and both these humpbacks came up to the boat and swam under it. He's playing on his little flute or something. They're swimming around him.

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After he quit, they went away. And I've seen the humpback whales, the other thing's up there, and a blue whale. Blue whales, monstrous thing. First time I saw one of those, I couldn't believe it. Saw the humpbacks do the jumps out of the water and everything like that. But the report on there you could see every practical sea lion there is, several different types of porpoises. Saw a pod of six killer whales come swimming by one time.

And on way back one time, I looked at – I was doing something in the cabin and I looked out over the side and here's a big sea turtle swimming along time. That was on the way back, about halfway back. So I've seen all sorts of animals.

Livingston: So what did you tell people when you got home, or friends, or whatever of these experiences that most people probably can't relate to? How did you describe these?

Sherman: Well, I described it to friends or something like that, but not one single one would ever volunteer to go with me out on a dive. They would not do it. You go out there and you get 20 minutes bottom-time. The people dive on computers and everything like that, and you think, you don't need – all you need is a watch.

You got your pressure gauge, or something like that. You dive down there, and I had a dive timer. There's a little old tiny dive timer. That was what I went by. I'd go down there, and when that thing got either between 20 and 25, I looked to make sure I still have enough air for everything, and then go back up. You decompress, take your time, always be conscious of where the hell you're at.

Livingston: So what did you tell people about what you saw when you're diving?

Sherman: Well, the first thing was you saw color in the water. Nobody believed you. Probably there's a lot of people who still don't believe you because they have never read the record of the Corynactis transfers color or some _____, and everything like that. Different species change color, so nobody believed that.

Everybody kept thinking you're crazy, you're crazy. Nobody dived past 100 feet. In fact, I don't think any of the UPS members have ever gone deep up there. They most they're even dives in Monterey are very seldom. But their main things are trips. To Indonesia, Australia, you name it, somewhere. That's where they go on trips. So let's – they didn't have any use for us at all. You're crazy.

Livingston: So yeah, so what was in it for you? Why did you want to keep diving there?

Sherman: It was so beautiful. You can't beat it. There's no way you can beat that dive. There's no way. Farallons comes pretty close. There's a lot of things in the Farallons come pretty close to it. One part of the Farallon up there on the northern, between the last rock and Noonday Rock are something that's underwater that's sorta they blew the top off, because ships were hitting it.

Right in there there's sort of a flat area. It's about 120 feet, something like

that. We tried to collect rock samples. You had to dig through that much growth [*indicates about 6-8 inches with hands*] in order to get it to a rock. And it's green, and it looked like green rolling hills, just like this underwater. Visibility is 100 feet. I look over, and here's the Medusa, the big, large, long ones, ten feet long swinging over my head. So you can't beat things like that.

You just – there's no way. I dove with – one dive I did up there was – I can't remember what year it is. It was – what the hell? I don't even have it written down. Oh, here it is. In '84, I did a dive in the Orkney Islands, just above Scotland. And up there, we dove on the German World War fleet that was sunk there.

00:50:05

Livingston: Must have been cold, and really interesting.

Sherman: Nope.

Livingston: No?

Sherman: It's exactly like Monterey. There was no difference in that diving from Monterey. And the strangest thing's Scapa Flow, the Germans after World War I, all the German fleet was transferred to Scapa Flow. One of the greatest movies I think that would ever made was all this line of German ships, battleships, cruisers, destroyers, submarines, in one single line traveling across the English Channel to Scapa Flow, and there's no footage of it.

I tried to get some, 'cause I made a movie on the whole place up there. And what they did up there on one single day, the Germans didn't know what they were gonna do with the fleet and the people up there that was just skeleton crews. And they were roller-skating around on the decks up there. The place was falling apart, so they decided to scuttle the entire fleet. So they sunk it.

Battleships ended up upside down up there because of the heavy weight and everything like that. And during the time up there, the British thought they were trying to escape or something, so they sent out their – and actually killed seven of the people up there because they thought they were trying to escape. They actually weren't. They were just scuttling the

fleet.

In fact, there was a woman up there I met who was with schoolchildren that day, and they took a boat trip that day. And that's the day they decided to scuttle the fleet. So they were sitting in this boat watching all these boats sink all over the place. I shot some footage of there that they – the ships were really originally – they sunk caissons into the ships, and people crawled into the caissons into the ship, divers working outside, inside, cleaning out all the boat, closing up all the holes.

They raised the ship upside down, then towed it down to the shipyard in Northern Scotland where they tore 'em apart. There's still five of 'em still sitting there, large ships. I dove on 'em.

Livingston: Now at Cordell Bank, how many dives did you make?

Sherman: Twenty-three total.

Livingston: Twenty-three? And why did you stop, or why did it stop at 23?

Sherman: That's because we ended it. We quit. '80's – what is it – '83 – no '82. '82 was last – was 11/14 was the last dive on there – and that was the – oh, the one I gotta tell ya this other thing up there. You'll see it in the movie up there but the dive was to made on one pinnacle, and there was another pinnacle nearby. And they were gonna drop the anchor here and tie a transect line to swim over to this one.

Well, during the movie you're gonna see Tom Santilena carrying the transect line across the side. Bill Kruse looks like he's about 50 feet away from 'em, swimming. Shot the picture of him; 100-foot visibility. The next dive I went down, following behind Bob, came down to the pinnacle, grabbed a hold of the transect line and walked into complete darkness.

A plankton bloom came down and went right through the middle of that one little area. So the entire time I'm crawling across this line, I can't see a bloody thing. I can't even see Bob in front of me. So I'm going across here, and we find get to the other side, and we find this other pinnacle which had this big monstrous hole in it or something like that.

We got some – and coming back was fine. But that one particular moment

coming across there was a plankton bloom that came in and you couldn't see nothing. You're just trusting your strength. That's what Cordell Bank's like. You trust up there. When you go down 160 feet or something like that, it takes a while, and you're wondering, "Where the hell is it? Where in the hell is it? It's gotta be there somewhere."

That was like it is on your first dives up there. You're trying to get to it.

Livingston: Was every dive different?

Sherman: Yeah. Every dive – senior year's a lot the same, but every dive was – there was something, always something slightly different, or something like that, the rock formations, the holes we found, all of those holes. We dove every single one of 'em. I've seen practically every single one of 'em up there at the time up there, so that's one thing up there. And you're wondering what they were for and everything like that.

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Livingston: Were you among the first people to find the holes?

Sherman: No, I wasn't the first one that found out. I think Don, Tom and Bill found the first one. Then we found the other ones nearby it, a few other places. But you couldn't figure out what it was. We finally figured out what it was. It was the Navy. Somebody had been there before, diving up there and blow holes in it – because there's no way. That thing is solid granite.

There's no way you could chip it at that thing and get anything out of it chipping it. It had to be blown. It had to be shaped charges up there and blown out. And probably they put sensors in it. Because at one time we were trailed by a destroyer coming back, one of our earlier dives. It stayed behind us all the way coming back to San Francisco. I don't know if they wanted to do anything or not.

Coast Guard came over one time and was taking pictures of us. I guess they take pictures every once in a while of boats all the time out in the ocean or something like that, but they came by and flew around us a couple of times. And now a submarine I think was behind us at one time, too. And during the time, we did a – Lee McCarran– you remember him from the KGO? He was the specially reporter. At the time Van Amberg was the news man at the time. Lee McCarran, he came out with us several

times and made several dives on the whole thing up there. So he was familiar and we were on Channel 7 twice, reports of that. And at one time up there, they were thinking of canceling the dives up there because whether the Navy was insisting we were in the wrong place, we shouldn't be there, or something like that.

There was little controversy or something like that where we first found the holes. So up there – but Lee McCarran did a good job on reporting up there on the Channel 7 reports. He did it twice. I've got copies of it, too.

Livingston: Well, so it sounds like you did run into other people out there now and then.

Sherman: No, never. Never saw another person the entire time. Late – now up there is what happens is a lot of fishermen have found the pinnacles and they know where they are, or something like that, so they're fishing. Let me see. The one time we went out there, it was the only time Bob let us fish. We fished for 10 or 15 minutes, 10 minutes at the – all he had was a pole, three hooks hanging on it, no bait.

Drop 'em down before that thing hit the bottom, you'd had three hits. Just like that, boom, boom, boom. You take more time pulling the damn thing up than you did up there. In that short time, 10 or 12 minutes – it wasn't very long because he wanted to get back – we filled up a garbage can full. We filled up the garbage can. It was only three of us fishing. And we've hauled – as soon as he dropped the thing, as soon – and before it even hit the bottom it'd be a fish hitting on it, things like that. And that's how the schools were at that time.

On this last dive that I made, the schools were not that thick. There weren't that many. Before it was just you had to plow your way through 'em, but it wasn't this last time.

Livingston: Did you have any scientific interest in this, or knowledge about it, or did you –?

Sherman: Not really. I'm just an enjoyable diver. I was thinking of pro diving one time in my life. There's no way, or something like that. It's too much or trouble, or something. Just have fun. I don't look at diving as a work or something probably is a biological thing.

We had a couple of dives up there in the Hammerheads where we did a survey. We put down a plate with some different metal on each corner, and we set it down in Point Lobos. And we watched of the growth of how growth was going on of something like that. We did that for about a couple of months. In fact, we got – while everybody was trying to get into Point Lobos, we had a free access. So we were just diving at Point Lobos for a couple months there for practically free without any hassle. And that's where they were only letting ten divers in at a time, or something like that.

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But other than that, the scientific thing up there, I've gone through all the samples. Several times go over to Bob's house to separate samples or something like that, and do all that work or something like that, and try and note everything like that, but that's about the main part of my scientific thing.

Livingston:

What's your impression of Bob as a leader, and how did he assign you particular roles?

Sherman:

I don't think it was ever assigned. No, is what happens is like I said, I was not a major thing. So even though – well, let's put it this way. Even though I'd dive all those dives with Cordell Bank and I dove the thing down there and we'd go to Rocas Alijos – twice I went there – and Easter Island. He appointed some guy he just met who was running a dive school as the head master.

He was gonna tell us what we're doing, if we had to do a check-out dive to satisfy him. And we had to make sure we're doing everything right in order to satisfy him. And, Christ, we had, I don't know, I had 20 years experience diving over him. So that's the way Bob was. He'd always picked somebody out of the blue or something like that was over us all the time up there, and it got me a little bit so – but it didn't bother me. I just sat and went along with the tide in order to get my diving in.

Livingston:

Did it appear to you that preparation and all of that for these dives was done well?

Sherman:

Yes. Before every season, we had to do a practice dive. Everybody who was going on that dive had – going off that season, had to do a practice

dive, and the practice dive to 150 feet with double tanks in order to get down to see how you _____ up there. We took people out. A couple of 'em decided this was not for them, even off Monterey, go on up there near close to the end up there and take 'em down to a 100 feet or something like that, and it's a difference experience.

Some people react to it well. Some of 'em just totally panic out, or they just can't do it. But we had to do it every single time. I even dove down to the Monterey trench, went down to 150 feet in the Monterey trench sloping down. All it is, is dirt. It's not very interesting. Went down there just for a practice dive one time. I went down with Bill Kruse, and I think Tom Santilena up there. We went down there just for the hell of it, just to get a practice dive in. We did it a lot of times. Every single year, you had to go out and do that practice dive.

Livingston:

And so you felt that the safety precautions were adequate?

Sherman:

Safety precautions were better than average. You had to – when we went down there, Bob would have to find the pinnacle. Then he'd have to find the current. Then he'd have to find everything else and make sure that when you drifted over that thing, the anchor would go down and lay over the top of the pinnacle. It had to be that way. Otherwise it didn't go.

It takes a while. You're sitting out there waiting to drop the anchor all this time up there. Then you had to set the buoy, the raft out there, whatever it is. Hang the T-bar off it. Get everything ready. Everything has to be ready first. You know what the T-bar is? It's a pole, hangs down ten feet with a crossbeam on it that's exactly ten feet and there's a tank hanging on it. So that's if you run out of air or something, you gotta a tank when you come up for decompression.

You have to hang on this line for about 10, 15, 20 minutes sometimes, depending on your depth and time below. So you had to have those. Had to have a safety diver out there. Besides somebody that's in the boat, there had to be a safety diver in order when you came up, he would go down and take your equipment from it, and put it in the boat so you wouldn't have to hang on to it or stuff like your cameras and whatever dive bag you had. You gave it to him and he'd put it back up there.

Then when you went down, you went down in teams of two or three. It'd

have to be ready, get everything set, check your tanks, your air, everything before you got down, sit on the edge of the boat. When you get in, drop off right next to the buoy up there. You have to be down. Then you'd check your gear before you go down. This is time-consuming as hell. This takes a lot of time, so that's why up there we'd only get _____ a day, or something like that, and the last one is late or something. You don't wanna – you want to get back to Point Reyes before its dark or anything like that. You don't want to run any trouble.

01:05:15

Then when you're ready to go down, you go down. Then you do your dive _____ thing. When you come back up, you do your decompression. You do your decompression first. Then you get in the boat, and you come back and you tell exactly what happened. Then, the second team gets to go in. Then, the second team gets go in. Not until they're back on board that boat do the other party leave. This is pure safety up there.

Nothing is put – there is only one time there were three dive teams in the water at one time. The water was calm, peaceful, over a 100-foot visibility. And I remember the time because up there when I got down the bottom, here's another team sitting down there waiting for us, or something like that. And one was going up and another one was starting to come down. That was the only time there was more than one team in the water at any other time, and it was just because the conditions were absolutely perfect and it happened that way.

Like we said, never an accident. One guy did have migraines, so when he came back from diving, he had a migraine headache or something like that. So we – but that was something he already had before and it was no problem. It's just that he wasn't in very good shape at the time. But he was a firefighter. He was an emergency firefighter from Redding. But that's the only incident. Not one single – except for Bob.

One morning we're going out – or evening – when Breck was going out on there, I'd usually come down to Berkeley and stay overnight on the boat, so we'd get an early start. I came down there and Bob came down there. Breck hasn't been there yet, so the gate's locked. So Bob decided to climb over the fence and go over and unlock the door, right? So as he's going over, he slit his hand open. So I had to drive him to the emergency ward to get his hand sewn up. And had to fight to keep him back on the

boat. He wanted to go diving anyway, but we argued like hell to keep him off there.

Livingston: But what were the major dangers out there? Was there something that even you were a little wary about? What were major dangers?

Sherman: No, no. Some guy said they saw a shark one time. Said it was mako or something like that up there that was swimming around before. But never – I’ve never saw anything. I’ve been – I’m dying to see a great white shark. I’ve never seen one in my life, and I’ve been on the Farallon Island twice. That is something people do not get to do.

But we were invited on it twice, because the sanctuary people came out with us on several trips to document the animal life and everything. So they invited on us, the island. I’ve been on it twice. Nobody’s – that just doesn’t happen. You know how you get on the island?

Livingston: Yeah.

Sherman: There’s a crane. Crane that goes over and drops down this little basket with a hand-hold – (*Makes Noise*) that’s fun.

Livingston: On Cordell, what was the deepest dive you made?

Sherman: Probably 160-170, something like that. I coulda gone deeper one time. I was watching two of ’em and pulled a transect line. They were about ten feet below me, but other than that, I was just watching them. In fact, I filmed them a little bit. But mostly up there – there’s one thing I did get to – what was it? A hundred and eight-five feet in the Cayman Islands.

I’m swimming around the Cayman Islands seeing scenery all over the place, so I’m was feeling good. I decide to go down a little bit deeper to see if anything was different. The only thing different, those big barrel sponges that peep up, they’re a little bit bigger. They’re a little bit bigger, but that’s it. I just dropped down there and turned around and went back up. When I got back up, there was some guy about at about 60-80 feet above me. He says, “What are you doing down there?”

Asked me later, said, “I’m just taking a peek.” But that was the first time I

ever got that deep up there. But mostly at Cordell, it was 160-170. That's about all. My depth gauge was perfect.

01:10:10

Livingston:

Did you find much difference just in the 10 or 20 feet, differences in depth on the bank?

Sherman:

It thins out as you get deeper. Now one time, we had a small remote camera hooked to a tether that we took out there. And Bob did some filming up there and saw one sponge up there that was different than anything it else. It was a tubular sponge about this big around [*indicates about 8-10 inches high by 3-4 inches wide with hands*], about this high, purple. And that's the only – one other time I saw was on the last dive, on that white pinnacle, I saw that same bloody sponge. Surprised the hell out of me because mostly this other one was about close to 200 feet. I'll show you this other movie, and you'll find out exactly what the bottom looks like, some part of it anyway.

Livingston:

Now while you were doing these dives, and perhaps especially, as they went on and on up into the '80s, did you ever think yourself about, "This place should be protected," or, "This place should be some sort of conservation effort"?

Sherman:

Oh, we knew that from the beginning that it had to be protected somehow. I didn't do the work on that. Some other people did the work on the conservation and everything. That wasn't – like I said, I'm the guy off here on the corner up there, standing around, looking around up there. So other people did it up there, but I knew it should be preserved. I wish the preserved the fishing out there.

They preserved the diving. You can't dive on it. You know why? You can't put an anchor on it. You can't drop an anchor. That's why they set about a world's record on diving out there, because nobody else can beat it because you can't do it. You have to do it free-diving or something like that, or something – a free up there trying to pinnacle and then dive down and try to find it while you're on your own. But you can't drop an anchor anymore. They put that law in there?

Livingston:

Wouldn't that be too dangerous to go without an anchor, without a line?

Sherman: Oh, yes. You'd get lost immediate. You get off a pinnacle, you got several hundred feet. That thing is sitting right on the edge, on the northern edge of that thing. That's where it drops.

Livingston: Was that the general consensus amongst the people diving? Was it this place really needs to be protected?

Sherman: Yeah. There were sanctuaries going up in Monterey Bay thing up there like that, that there should be a separate one up there. It's a shame, though, that more people can't see it, what's it's actually like to go down and do a dive on it because you just can't beat it. I've never seen any other place in the world that even come close. I've seen lot of the UPS shows or something, the underwater stuff from the islands or something.

I dove Hawaii, and I've seen these other stuff from other countries, or something like that, where you see these little – the flowering and the coloring. It just doesn't compare because Cordell Bank is so thick. Everywhere else it's thin. Cordell Bank is thick. You got things growing on top of things. It's so healthy out there, the growth. Everything is sitting on top of everything else. You just don't see that anywhere else in the world. It's unique.

Livingston: So how did this experience, up till '83, influence you after it was completed, when it was all over? How do you feel that's influence to you?

Sherman: I wanna go back! I still wanna go back. If somebody said up there we'll go Cordell Bank, I'd dig out my diving gear and my double tanks, and I say, "Let's go." Any day of the – any day. Of course, I haven't dove for a couple of years now. I had a thing kept my insurance good because I had both knees replaced, so my knees don't bend the way they used to. And so it'd be a little tough.

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In fact at the last dive I did was a couple of years ago. Went down to Monterey with Don Dvorak, and not only I couldn't get down, I couldn't swim in a straight line. I was veering off all over the place up there. I couldn't swim in a straight line, so my diving is not that good anymore. I'd still love to do it. I've still got my gear. Still got a dry suit and my wet suit up there. I could still do it, but I just haven't up there. But I'd still go

back. Another place I'd go back to is the Farallon Islands. Have you seen all the islands?

Livingston:

I've seen the big islands, the south islands.

Sherman:

I've got a map up here, the Farallones, if I can find it. There's the big island. Then there's the middle rock. Then there's a little bit here, then Isle of Saint James which is a group of rocks. Then you go further up in northern rock, and then the other pinnacle that's underwater something like Isle of Saint James. Nice diving up there. It's nice photography up there. You go down. It's fairly shallow up there where you can dive up there. And you can swim through the entire rock, the largest rock over there.

There's a cave. It starts about this far underwater, and it's about, I don't know, about 15 feet wide, and it goes through the entire rock. Goes in, and there's a slight curve, and it comes out the other side. When I dove inside this thing up there, I tried to film it. My film turned out over light, too bright, because everything in it is white. You gotta an anemone. You got a starfish. You've got all these others. They're white. There's no sunlight in there, so it's totally white. And if the waves are breaking on the other side, it sounds like an explosion going off at the end. Boom, once in a while. Boom.

But it's – I'd love to get back in that cave again, just another peek or something to photograph it correctly. There's one rock out there – I think middle rock. It's curved. One side of it is curved. It's got a – on the northern. Yeah, I think – no, western side. It's curved. You could take a boat up to within five feet of that rock, and it's still got 100 feet beneath ya, because the _____ goes (*Makes Noise*).

There's two or three little tiny ridges about this wide [*indicates about 1 foot wide with hands*] on the way down. The bottom is just rocks on the bottom. But the thing, you can come up right next to the bloody rock up there with a boat, and you won't even see the bottom. I dove on that thing with Bob up there. Fantastic rock to dive on, and that's just plain rock.

Livingston:

Now when you were diving Cordell Bank during those times, did you have any feeling that this was gonna lead to something, that there was some importance to what you were doing?

Sherman: I think we were exploring something that has never been seen – before other than the Navy – it’s never been seen before and we were documenting the hell out of it. We had more documentation on that bloody island, I think, than any other island around anywhere from all the trips we made back and forth, and all the pictures and diagrams and notes and collections of every conceivable variety, things that never – people haven’t seen for years, or something. And we’d think up there is so – it’s unique in the world. And this movie up there I’m gonna show you explains why it is.

Livingston: Can you repeat something you said earlier before we started recording about people don’t belong there?

Sherman: I don’t belong there. As a human being, you do not belong 160 feet underwater with just a little breathing tank on your back. It’s the unknown up there that you realize that you could be in serious trouble at any moment in time. In fact, I was down there – oh, I didn’t tell ya. One time I was down there and my – it was towards the end of the dive. My regulator free flowed. I was totally out. The thing is – I couldn’t put it in my mouth. It was blowing so hard up there, the pressure pushing it out. I couldn’t even get with it.

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So I had to go over to Bob who was close by, tap him on the shoulder show him that, and I had to use his octopus till we went up, or something like that. So they’re like that. So you can get in serious trouble. It’s always say the buddy system, the buddy system. You know what the buddy system is? It’s a fallacy. On Cordell Bank, it’s total fallacy. There’s no way a photographer can sit there and try to take a picture while somebody is banging on ’em or bumping into ’em or bothering the hell out of ’em. You do not want anybody near you.

If you’re trying to shoot a movie underwater, trying to hold a camera still is one of the worst things in the world if you’re following something like that. It’s really – you don’t want anybody bumping you. “You get the hell away from me.” So you know they’re there, but they’re not that close to you. So real close buddy systems – it’s nice. You’re down there. You know when they’re down there, and they’re close by except for that one time when I got lost from everybody else up there. That was the only time I was ever lost. I knew where they were all the time. “He’s over there

taking a picture.” I’m not going to go near ’em. I’m not going to kick up any sediment, or something like that, disturb the water.

Livingston: So what happened with your films? Were they yours or did you hand those over to Bob?

Sherman: No, I’ve got all of mine up there, the ones I have or something like that. But I did turn some of ’em to Lee – no. I can’t even think of his name now. The guy from TV, KGO, Lee McCarran. I turned some footage over to them. They used some of it, not much. They had some other things. They mostly used the slides up there. Slides were the best really things up there that went on, except for one dive which you’ll see in the movie here.

The one guy borrowed a Sony camera, full-size Beta with an underwater housing. And he talked ’em in to taking out on a dive to Cordell Bank, and he shot some video down there. So my original filmage you’re gonna see, there was an intersperse of film. Most of it – a lot of it was mine. Some people – some other film, or something like that. But then when this video was shot – we originally put this whole thing together to show it to the UPS to provide for one of their shows they had. We presented it. They said, “No, it’s no good.”

It was a combination film and slide show, perfectly timed. Everything worked out great. They didn’t like it. They didn’t like it. We didn’t make anybody happy. Well, a little while later they took that video and interspersed it where the film was, and it came out beautiful. We loved the movie. In fact, everybody was enjoying it, I think. The members up there that saw the thing, thought it was great. I think it was nice.

And then UPS came up one time. I took the video and entered it under Bob’s name. It won second prize. Bob and I are sitting in the audience or something, and they announced the winners of the prize or something. He’s looking at the program. He sees his name written in for second prizewinner. He didn’t even know it. I entered it under his name, and it won second prize for the UPS after they turned us down two years before. So that was – it cracked me up. It cracked him up, too.

Livingston: So let me see if I got this right, that you took the films for your own purposes, that you weren't really doing it for Cordell Expeditions as much, or were you?

Sherman: Well, I tried to put movies together for Cordell. In fact, I made one on the Rocas Alijos one, too, up there. The camera I had when I went to Easter Island screwed up terribly. Shutter went outta sync. They used some of that film in the movie that somebody else put together on Rocas Alijos. There was a professional photographer along on that trip and shot a lot of film that Bob's still got, but it was never put together.

I've only seen one little part of it. It even had me in it swimming around there with one short part. Just like the film that they showed at – did you see the Film Festival? The first Cordell Bank one, the one when he was shooting around on the underwater thing up there? Do you know the guy who was jumping off the boat? That was me doing a header, flopping off the boat. But that's the only one part of that little movie. I might get a copy of it just to keep it around.

01:25:00

Livingston: Well, now that Cordell Bank's a national marine sanctuary and you were part of that whole process. So how does that feel to know that you're part of this process that resulted?

Sherman: Great. When I found out I made the most dives on it, that really surprised the hell outta me because I thought somebody else would be, too. But I know a couple of times people didn't go on dives or something like that because of some reason or other. That probably up there – Bill Kruse must have at least 20 something dives on that thing, and I know Don must have close to that many.

Sue had a lot of dives. After she got through that first experience, she was one of the – she was an experienced diver. She's been all over the place. She was on the bank out here and then the Rocas Alijos, and also on Easter Island up there. So she's been around a long time; very good diver.

Livingston: Well, is there anything else specific to Cordell Bank that you don't think you've told us that you think would be of interest?

Sherman: I'm trying to think. Other than the other trips or something like that up there like this, not really at the moment that I can think of.

Livingston: Well, why don't you show us the movie, and thank you for this.

[01:26:22. End of Audio]

PIONEER DIVERS OF CORDELL BANK
III

Oral history interview with
The Sacto Team
Steve Williamson, John Walton, Jerry Seawell,
Dave Cassotta, and Dave Walls
June 5, 2010



Left to right: Steve Williamson, John Walton, Jerry Seawell, Dave Cassotta, Dave Walls

Edited Transcript

Interview length: 2 hours, 20 minutes

Interview by Dewey Livingston
with Jennifer Stock

National Oceanic and Atmospheric Administration
Cordell Bank National Marine Sanctuary
PO Box 159, Olema, CA 94950

Dewey Livingston: This is an oral history interview with five members of what is known as the Sacto Team, a group of divers who joined with Cordell Expeditions on many of the historic dives on Cordell Bank in the early 1980s. It is June 5th, 2010, and this interview is taking place at Point Reyes National Seashore. As lead interviewer, I am Dewey Livingston on contract with Cordell Bank National Marine Sanctuary.

Jennifer Stock: This is Jennifer Stock, and I'm the education and outreach coordinator with Cordell Bank National Marine Sanctuary.

Dan Howard: I'm Dan Howard, the superintendent of Cordell Bank National Marine Sanctuary.

Dewey Livingston: All right, thank you. So one by one, would you please state your name and spell it, your current hometown, your current or recent occupation, and your diving experience prior to diving on Cordell Bank?

John Walton: My name's John Walton, W-A-L-T-O-N. I live in Shingle Springs, California, and my occupation is construction inspection supervisor with Sacramento County. My diving experience prior to Cordell Bank, I was an open water scuba instructor/divemaster. I started diving at age 15. At the time of the Cordell Bank, I was working at the Cassotta Diving, Incorporated, in Rocklin, California, and was teaching classes. And had some specialties in deep diving, marine science ID, and research diving.

Dewey Livingston: For instance, where had you dived before, some notable places?

John Walton: Most of the diving was from Monterey to Fort Bragg, California. I was certified in Monterey. We taught most of our classes in Fort Bragg-Mendocino area. So the majority of my diving was in northern California, before the time of Cordell Bank.

Dewey Livingston: Thank you.

Steve Williamson: Steve Williamson, W-I-L-L-I-A-M-S-O-N. I live in Roseville, California. I'm a retired fire chief, Groveland Community Services District. Spent 30 years in the fire service; now currently work part time for the California Conservation Corps.

I began diving in about 1975. Took classes at Keane's Aqua Shop in Sacramento and got into your advanced courses. In 1977, I attended Coastal School of Deep Sea Diving in Oakland, California, where I learned how to work on oil rigs, blowout preventers, and underwater welding, things of that nature, and hard-hat diving. Dove the Navy Mark V helmets that you would see in *Men of Honor* and those type of things.

1978, I took some advanced courses at the Cassotta Dive Shop. Equipment specialist. Ended up being a divemaster through that shop, and did a lot of diving basically from Monterey north to Fort Bragg area. Did some diving down at Santa Barbara Channel Islands, all sport diving. Did some commercial work in the Delta Bay Area for a while, freelance.

Jerry Seawell: Jerry Seawell. That's S-E-A-W-E-L-L. I currently live in Roseville, California. My current occupation is a police officer for the city of Rocklin. My dive history: I started diving when I was in high school, 16 years old, 1969. In 1974, I went to Commercial Dive Center in Wilmington, California, where I learned to be a commercial hard-hat diver. Following graduation there, I worked for Oceanary International in Louisiana. Worked on oil rigs. Came back and did some harbor construction in Long Beach/L.A. Harbor area. When I came back to Placer County, I hooked up with Dave Cassotta at his dive shop and became a photo instructor, teaching photography there prior to Cordell.

Dewey Livingston: That was underwater photography.

Jerry Seawell: Yes, underwater photography, yes.

Dave Walls: I'm Dave Walls, W-A-L-L-S, and currently I'm an educational consultant for Professional Association of Diving Instructors, PADI. I live in Lake Forest, California, by the way. Began diving around 1976, [5:00] and by 1978 I had worked my way up to become an instructor and, like the rest, went into Cassotta Diving and went to work with Dave, teaching classes there. And in general, my diving experience runs up and down the coast, from northern California, southern California, with some excursions into Mexico as well.

Dave Cassotta: I'm Dave Cassotta, C-A-S-S-O-T-T-A. I live in Rocklin, California. My current profession is, I'm a guitar maker. I have a guitar company in Rocklin. I began diving when I was 13, and then I guess I was probably,

what, 19 or 20; John Walton and I took an open-water dive class, got certified again. And later on, in '74, I attended PDIC, the Professional Diving Instructors College, in Monterey. And from there I took a job in Long Beach and was a manager of a dive shop down there. And later on, in '77, opened up my own dive shop with my wife, and that's how I met members of the Sacto Team, except for John Walton. We've been best friends since high school, so he's a good friend of mine.

And so we all met and started working together in this business that we had. And Dave Walls walked in to our shop, became one of our open-water instructors, and Jerry was our photography instructor. Steve was one of our divemasters, and John was our head open-water instructor. And that's mostly what we did before Cordell. We would run Caribbean trips, and so some of us have been able to dive in the Cayman Islands and the Bahamas and so on.

But most of our diving was the California coast, from southern California all the way up to Eureka, and we did a lot of inland diving as well as Lake Tahoe and some of the lakes and rivers. John Walton and I had formed a small little company called Subaquatic Technologies, where mostly what we did is we brought up sunken boats. So guys would go out and sink their jet boats in the lake, and we'd go find them and bring 'em up.

And there was some real neat experiences there, which is a lot of stories that don't pertain Cordell Bank. A lot of that, of what all of us had done really helped us out in diving Cordell Bank.

Dewey Livingston: Okay, thanks for those introductions. To start with talking about Cordell Bank, but prior to getting into details about diving, I'd like to ask, how did you learn about Cordell Bank and these expeditions, about what year that was?

Dave Walls: Back at the time, I was married to a nurse – ex-wife – and she came home from the hospital one day and mentioned that she had a doctor friend that mentioned that he was friends with Bob Schmieder, head of the expedition, and that Bob was looking for some people, especially with some sort of deep training or experience, and ideally, if they had some medical background at all would be helpful.

So immediately, I thought of some of us. I know that I had gone through EMT training. I'd done deep instructor training. And I knew John was an EMT also, a volunteer on the fire department, and a similar background in diving. And then Steve, fireman, EMT, and John, background in commercial diving, and Dave Cassotta as well with all that strong background and all of that. So brought it to all of us, to all of them, and that was it. We got back with Bob Schmieder and were on.

Dewey Livingston: Had you heard of Cordell Bank? Did you know anything about it?

Dave Walls: I had no idea. I thought you saved money there maybe.

Dewey Livingston: Anybody else have comments on that?

Dave Cassotta: I remember we were working in the dive shop, and John and I were working in – I guess it was probably in September, [10:00] maybe '79 or '80. And Jerry Seawell came in, and he was telling us about this expedition to Cordell Bank. Well, neither one of us had ever heard of Cordell Bank, and so Jerry showed us on a map, and we were kinda concerned 'cause Jerry wanted to go. And we thought it was in the Red Triangle, and that's a place that we don't normally dive.

And so we were teasing him about being great white shark bait, and we actually created a file in the dive shop called the Great White Shark Bait Expedition, and that's where we put all of our documents regarding the Cordell Bank dives. And we said, "Well, if you survive this dive, come back and show us the pictures."

So he did survive and came back with the pictures, and we had a classroom there at the shop, and he was showing us the slides. And I remember John and I looked at each other; it's like, "We have to go there. We have to become part of this."

And then Dave just had heard about it. Dave Walls had heard about it from his wife, and he got some information, so we all got together and filled out the forms and hoped that we'd be good enough for Schmieder to include us.

Dewey Livingston: Is there any reason that you can think of – as you all had experience diving the California coast – that you didn't know about Cordell Bank? Was it just too far off the radar? Why didn't you know about it?

Dave Cassotta: Well, for me, I had never heard of it. I'd been on fishing trips to the Farallones before, and my very first dive instructor was a man named Leroy French, who dove with Bob Hollis and Al Giddings out at the Farallones and got bit out there. So I'd never had any desire to dive the Farallones, although I knew people who did. But I had never heard of Cordell Bank.

Dewey Livingston: Were there other popular dive areas in the vicinity of it in the Farallones? I don't hear about people diving off Point Reyes or...

Dave Walls: Yeah, I think that was the point, that for us in the recreational dive industry, Cordell Bank was off the map. No one dove there, so there was no talking about it. Nobody was really familiar with it.

Dewey Livingston: Any other comments on this early part?

John Walton: I remember when Jerry came in talking about Cordell Bank. We thought he was crazy. It's too deep and too many sharks, and it's too far out there. We're talking 20 miles off the coast. So at first it was like, this is not realistic, and thinking that maybe Schmieder was a little bit nuts.

But after he came back and showed us the pictures and we saw how jazzed he was, we all had to go. And so we drove down to Walnut Creek and introduced ourselves to Mr. Schmieder and had to prove ourselves to him, and then from there we were out the next fall, in 1980, diving.

Dewey Livingston: You were quite early, then, in the dives.

John Walton: Yes.

Jerry Seawell: Yeah, when I first heard about Cordell, I didn't know anything about it. I figured the water would be just like off San Francisco: green, cold, limited visibility. But I was kinda antsy to go, the excitement, the adventure. I knew I had my training behind me.

So when I contacted Schmieder, he goes – kinda told me what’s involved. I’d have to have double tanks, which I didn’t have, so that’s the way I contacted Dave. I said, “Dave, I gotta have some doubles.” I just kept singles, so Dave hooked up and got me a manifold and everything, got me set.

Went on the expedition, and the seas were pretty good that day, and I went diving. Had a 35-millimeter camera I took down there, and the fish and the visibility and everything, I mean, it was just like paradise to me. So when I came back to the dive shop and told these guys about it, I was so jazzed, says, “You guys have got to go. There’s no place like it I’ve ever seen.”

Dewey Livingston: And that was the 1980?

Jerry Seawell: That was 1979.

Dewey Livingston: Steve, anything about learning about Cordell Bank, your first – not first dive, but your first impression –

Steve Williamson: I think I was the last one to learn about it, and [15:00] Dave and John and Jerry and Dave also told me. They knew I had deep-diving background and was a working EMT firefighter, so I had a pretty good medical background in trauma and things like that. So like the rest of ‘em, I applied and sent a letter of request to Bob Schmieder and got approved, and that was the beginning.

Dewey Livingston: Were there many formalities about joining up with Cordell Expeditions? Did you feel like you were joining this legal entity in a sense, or was it more informal?

Steve Williamson: To me it was informal. We just showed up with our gear and put it under the deck of the boat and went out and waited for our dive time, or whenever we were gonna go in the water, and the tasks that we were assigned. The first trip, we brought our dive gear and things like that, and then we weren’t sure what we were really gonna do, except for Jerry, who was the photographer. And then the trips afterwards, when we went down, if we were gonna collect samples, we knew what tools to bring and the specialized tools as well, jackhammers, core pounder for the holes that the Navy put in, didn’t like us pounding on ‘em, and things like that. As

the expedition progressed it got a little more formal, a little more organized, but at the beginning, from my perspective, it was informal.

Dewey Livingston: Is there a meeting before the dive where everybody got together, or did you just show up?

Steve Williamson: Is that prior to going out?

Dewey Livingston: Mm-hmm.

Steve Williamson: I didn't recall any meetings. I know that when we did a little brainstorming once we all got down there and on the way out – we had quite a while to get out there, and the boat that they were using was a converted shrimp boat, so with single engines. It didn't go very fast at all. So we had a lot of time to get prepared and sort out what we're gonna do and our sequence of events for diving and things like that.

John Walton: I remember going to Bob Schmieder's house and meeting him, and he wanted to know our deep-diving experience. And he required us to do a deep dive before we went out, and he wanted a long deep dive to 150 feet. So we did our best to go find deep water and did a deep dive before we went down. I remember going to his – did anybody else – I remember meeting him at his house and talking to him and kind of getting to know Bob. I think about it, Jerry and I – it's only been 30 years ago.
[Laughter] But yeah, he did require practice dives before he let us go out.

Dewey Livingston: Down around Monterey?

John Walton: We went to Lake Tahoe. We went to Folsom Lake. We went to San Jose Beach, Carmel. We did a dive, practiced out there, so there were numerous places we did our dives. Wherever we could find deep water.

Dewey Livingston: Was there a setup of communicating amongst the team? Did Schmieder call everybody and say, "Here's what we're doing"? How did you communicate?

Dave Walls: All I was gonna say was, of course, we communicated with each other 'cause we were all friends and worked together, all of that. I don't remember how Schmieder was communicating with us personally, by phone call, or – yeah.

Dewey Livingston: It sounds pretty informal –

Dave Walls: Yeah, it was.

Dave Cassotta: He would call the shop from time to time, and he knew that if he called the dive shop, that all of our team would be aware, so that was pretty easy for him to just call one place and let everybody know. But he was really good about sending out letters. We'd always get a Cordell – seemed like every week or so, there'd be something from him regarding the upcoming dives, plans for dives, some of the goals hoped to accomplish in that year's expedition, when he was having a barbecue, and things of that nature, trying to keep everybody together, because a year would go by before we'd see the rest of the dive teams and even see him.

John probably out of all of us had the most education and experience in marine biology, [20:00] and so he was really fascinated by what we were finding down there. So his relationship with Schmieder was probably much closer in that respect as far as the science was concerned, where the rest of us were just hired-hand divers, really – volunteer divers; we weren't hired. But we were – it was cool to see all the marine life, but I couldn't tell this sponge from that sponge, but John would be all jazzed over “Hey, look at this.” “Yeah, that's cool, John.” *[Laughter]*

John Walton: We had to pay to go on these expeditions. In the beginning I think it was, what, \$60 a weekend or something. So he wanted to collect his money before we went too, so he made sure that we – he had to finance his boat trips, and we all gave the money willingly. It was definitely well worth it.

Dewey Livingston: Now, did you always go as a team, or when you got there onto the boat, did you just become part of the crew, or were you always the Sacto Team?

John Walton: We would dive in dive teams of two to three, usually in the Sacto Team. Because of our jobs, we wouldn't all go on the same weekends. Sometimes we were all there together; other times we weren't. But all the dives that I went on were with either Jerry, Dave, Dave, or Steve, and we didn't mix out of the Sacto team.

Dewey Livingston: Do you have an idea of about how many dives you completed as a group?

John Walton: I can remember eight distinct dives, but I know that I was on at least 14 or 15. Being it was 30 years ago, they all run together. Mr. Schmieder has all the logs of the dives. I would love to read the logs and refresh my memory. But as a team, I don't know how many. I know I was in the teens.

Dewey Livingston: Steve, did you have an idea of how many dives you –

Steve Williamson: Yes, I'm tallying them up now.

Dewey Livingston: I notice you have dive logs that you kept.

Dave Walls: Like all good divers should do.

Dewey Livingston: Yeah. You're the only one? *[Laughter]*

Dave Cassotta: I think so. I think we might've all started, like, the first couple...

Dave Walls: Yeah, my dog ate mine.

Dewey Livingston: Just a general idea, now I get a sense of this.

Steve Williamson: Unofficial total that I have, our actual dives on the bank is 10 where we were as a group. There might've been a couple that I didn't add in here just for reasons unknown to me, but I usually keep pretty good diaries and logs and things of that nature. And listed in all these are all five of our names, and some of us we paired as a group of two, three – we did make, I believe, at least two dives where we all five go together at once, which isn't normal practice for the most part; we're on the buddy system. But it worked for us.

Jennifer Stock: What time of year were most of these dives?

John Walton: They were all in the fall, starting, what, September, October. No further than October. I know that the currents die down. Early September into October, the Davidson Current takes over the coastal current. So there was just about a two-month period of each year that we could dive out there. Two and a half months or so.

Steve Williamson: I can confirm that with my dive logs. The last one, in 1981, was on October 25th.

Dewey Livingston: Since you have a list there, could you list the dates? If there were ten dives, say, as a –

Steve Williamson: Sure.

Dewey Livingston: Unless they're all spread out.

Steve Williamson: No. First dive I have in 1981 was on October 10th, and I have – listed is John Walton, Dave Cassotta. We were used to collect samples. Dove on a pinnacle approximately 400 square feet, with drop-offs on each side. [25:00] Basically, it was a quick dive. We decompressed at four – for four minutes at ten feet.

Dewey Livingston: There was – we'll go into the individual dives, so just the –

Steve Williamson: Oh, the dates.

Dewey Livingston: – the sense of the dates, in the range that you were diving.

Steve Williamson: Okay. 10/24, Cordell Bank, north end, 140 feet; 10/25, Cordell Bank, north end, 120 feet.

Dewey Livingston: This is all 1981?

Steve Williamson: Yes. That's what I have for 1981.

Dewey Livingston: So multiple dives during –

Steve Williamson: Yes, on a weekend we would dive once each day, usually.

Dewey Livingston: Schmieder referred to you in his oral history as – and I quote – “the real strong divers.” And would you like to address how you saw your role, the Sacto Team, in contributing to Schmieder's Cordell Expeditions? Anybody wanna start with that?

Dave Cassotta: Well, as a team, we were able to meet and work with some of the best divers that we've ever experienced before, 'cause normally we dealt with

students. So being around other divers that were good divers and experienced was really a joy for us.

As a team and working together in the diving industry, it was second nature to us to dive. It was just what we did every day. And we weren't just weekend divers. I mean, we were in the water almost as much as we were not in the water: doing dive classes, being in the pool, being at the lake. We operated a dive barge at Folsom Lake, where we taught people how to dive. John and I would bring up boats. Jerry would join us sometimes and photograph the CF numbers on the boats that were on the bottom, for insurance companies.

So we worked together a lot, and we knew each other really well. And John was probably the person I dove with the most, and we could just look at each other and know what the other guy was gonna do or what he was thinking. Or I could tell if we were getting near the decompression time, or I could tell if his air supply was getting low just by the way he was behaving, and we kinda developed that as a team. So I could see why people who just maybe dove on weekends or something might've thought we were strong divers, because we knew each other so well. That was the big part of it.

And then I think after our very first dive at Cordell Bank, when we got back to shore, we met with Bob Schmieder and [Tom] Santilena and [Bill] Kruse, and we were all having a beer in the bar. And so our attitude was, "Okay, guys, so how'd we do? What'd you think?" And they made some flattering comments and were glad that they were around divers that they could trust and not have to worry about. And I think in the back of their mind is, "Here's a group that we can get to do just about anything, especially the things that we don't wanna do." *[Laughter]* So anyway, it worked out really well, and we were glad that they had respect for us.

Dewey Livingston: Comments on your role in the group?

Dave Walls: Yeah, following Dave Cassotta's statements, yeah, I think that the fact was that we had a lot of experience together and knew from personal experience, so we were competent divers. So we were pretty, I think, confident and able to go down and do the typical tasks that Schmieder would assign: bring up sponges this time, typically fist-sized, that sorta thing. But I think Dave and John Walton at the shop contributed a lot

more towards achieving their goals at Cordell Bank, with some of the really, really interesting technology that developed. They'd built the dredges and figured out a way to rig triple 80s, with one upside down [30:00] to power the dredge, and on and on and on. And all through the expedition was we're coming up with these great innovations to help us meet the goal.

Dewey Livingston: Anyone else want to comment on...?

Jerry Seawell: I think Dave took some of the thunder out of what I was gonna say. But I think besides the diving part, that Schmieler considered us a strong team 'cause whenever he assigned a task, we completed it and went overboard – like Dave was talking about the dredges and things like that. It was our team that – basically Schmieler gave us the task to design and come up with a concept, and we followed through and were successful. So I think that's why he considered us a strong team in this organization.

John Walton: I remember that the first dives we did, and we were all a little nervous to get in the water 'cause it's a pretty intimidating place, but we were given our project to go down and collect specimens, and we came back up, and "What's next?" I mean, "Let's go. Let's go again."

And they were really impressed that a group of divers could come out, have their stuff together enough to get in the water, go down to 150, 180 feet, do what they need to do, come up, get out, and "Let's go again." So I think that kind of impressed them, especially that first day, and we became the special projects team. So whenever they needed sediment or rocks or anything special, they'd assign it to us, which was fun.

Steve Williamson: Just to add on to that a little bit, what the other guys were saying is, our job didn't stop when we came out of the water. I know that all of us spent many hours doing the rigging for the transect lines, the anchoring, doing basic maintenance on the boat, storing equipment, getting the other divers ready. I think we all can agree that some of the other divers were there just because they thought they were cool. And once their dive was over, they disappeared. We never disappeared. We worked around the clock until we were on our way in, and then we played.

Dewey Livingston: So you touched on something that I was gonna ask next, which is – were you involved in the transport, the boats, the equipment? It sounds like you took roles in that, taking care of the boat, etc.

Steve Williamson: We did whatever the captain asked us to do. For example, there was a hydraulic leak under the deck, and unfortunately it leaked all over my gear. So we went down and took care of that, and things of that nature. Usually, if there was some issue, the captain would ask one of us to take care of it, and all of us were of the mindset “If you don’t know how to do something, then you just tell them.” So we did a lot of extra stuff, and it was fun.

John Walton: Yeah, in the first years we–used a boat called the *Pisces* out of Alameda, and Breck Greene was the skipper and the owner. And he was pretty – how should we say? Breck was difficult to deal with sometimes. But it was his boat, and he took care of the boat mainly, but we did do a lot of the hookups of the strobes and getting the gear ready. We had to fill tanks, set up transect lines, descent lines, attach the buoys, get the inflatables ready. So you’re working all the way out to the dive spot.

Dave Cassotta: Mr. Schmieder relied a lot on us, and the fact that I owned a dive shop was a valuable resource to him. And so I would get phone calls: “Hey, Dave, can you bring an extra ten tanks down?” or “We need some backup regulators,” or “Do you have any inflatable buoys?” and things of that nature that – or “Can you get some?”

And of course, as John Walton had mentioned earlier, we had to pay for everything. “Can you get some” meant, “Can you buy some and bring ‘em?” And of course, we did, because we were part of something that we really wanted to do, so it wasn’t a problem. So we would bring a lot of the gear that other divers would need.

And then, of course, [35:00] you have to keep in mind that many others were on board with us that were not divers. The marine mammal folks and the bird people and a number of guests that were on board that were divers but were more like a weekend diver, and they wanted to actually see what was down there, like [John] McCosker and some of these other individuals that were guests on board. But they had no clue how to hook up a set of doubles.

So we would put their doubles together, make sure they were okay before they got in the water. Once they were in the water, they were fine, but it was just the specialized gear that we had to wear that they weren't that familiar with. They were used to diving the Bahamas or southern California, places that weren't quite as difficult.

Dewey Livingston: Did that cause you much concern that there were – did you feel like at least they were qualified to make the dives, or did you have some concerns about some of them?

Dave Cassotta: Yeah, we had a number of concerns, especially with some of the gear that they would show up with. They would show up with stuff that – first off, what you're using is 40 years old, and secondly, it's not for this environment. I mean, if you were in Hawaii, maybe, but not here.

We had a few incidents. There was one with kind of a famed underwater photographer, Lee Tepley joined us on a dive, and he was not wearing the right gear, and we were concerned about him when he got out there, but when he did the dive, he blew it. And I honestly believe if it wasn't for Steve Williamson, he'd be dead – either dead or would've embolized or had serious decompression issues, 'cause he came shooting up from the bottom, broke the surface, just panicked, and it was a big deal out there.

And fortunately – it was really kinda ironic – about the week before this dive – there was John Walton, Steve Williamson, another – there was other people that helped the Sacto team that really didn't dive there that much. That was Doug Niessen, Steve McCormick. And these guys were really good in the emergency field. And so we actually did a mock rescue there in Alameda in the water, where John and Steve and Steve McCormick and Doug Niessen all participated in a rescue, and it was ironic that the following week out there, Lee Tepley got into a situation. And you really should get Steve Williamson's take on this, because he was in the water with him. I'm just telling you what I could see from the boat. And it all turned out good, but it was kinda scary at the time.

Dewey Livingston: Should we tell that story now? If you'd like.

Steve Williamson: Yes, we were out at Cordell, and Lee Tepley had shot to the surface and was in sheer terror, panic, didn't know what to do. And so geared up real quick and got in the water with him and put a weight belt on him, took

him down to I think it was about the first – about 30 feet, and we were decompressing. Really wasn't sure how he was gonna do, and he started to panic and started ripping my mask – got my mask, pulled it off at one time, and was choking me. And I got him up to 20 feet, and he still hadn't settled down, and I got my mask back on. He pulled it off again, so I slugged him in the stomach, and that kinda settled him down for a while.

Then we were probably at 20 feet for at least ten minutes, and then at 10 feet we finally got him to the T-bar, and he started calming down and getting a little flaccid on me – too relaxed. And so I held him on the bar and gave him another little punch just to kinda keep his attention. He needed to breathe and things like that. And I think we were in the water a good hour or so, just hanging on a T-bar, and that kinda made me nervous because there are critters out there that – we are in the food chain. [40:00] But eventually got him into the inflatable, got him back on board, put him on some oxygen, and yeah, he's still kicking around, I guess. But it was an experience that I don't forget.

Dewey Livingston: Do many others of you have any comments on your relationship with the rest of the divers?

Steve Williamson: Like David has said and everybody else here is that you could tell the green divers, the rookies, or the ones that didn't have a lot of experience. But for the most part, after the first year, going into the second, I felt real comfortable around the core divers that were there, and then the guests. We would just have to look after them and make sure they're okay.

John Walton: The new divers would show up every now and then with the group. It would make us a little nervous. You have to realize, when you're going down on the bank, that if you get off the transect line and can't find the ascent line, you're out there in the middle of the ocean, 20 miles out offshore, with currents, and if there's any swell, if you surface off the line, you can't see the divers.

So that was the biggest thing was making sure – watching the bubbles, make sure they follow the same tracks, and they came back to the line. We had safety divers in the water, below the ascent line, to make sure, to help 'em when they got up, to guide 'em up and get 'em on the line and get decompression on the line. But it seemed like there was a group – a

larger group of divers started to show up the next few years after, what, '82, '83. We started to see more and more people show up.

Dewey Livingston: Which was more to manage.

John Walton: Yeah, Steve and I were kind of in charge of the boat safety. We were both EMTs in the fire department, so Bob kinda looked at us to take care of that aspect of the diving.

Dave Cassotta: I think it was our second dive that we ever made there, the second one. I was wearing a Poseidon Unisuit, which is a dry suit, and I just had jeans and a T-shirt on underneath. And we were diving, and we came up. We were down a little bit longer. A lot of guys would go down, and they would just do what they had to do but only stay long enough where they had to stop at 10 feet. We stayed a little bit longer, and we stopped at 20 feet and did our stop there, and then we had a longer decompression period at 10 feet.

And so we were on the T-bar, and as John Walton mentioned, we had safety divers that would come, and they would take all our stuff from us. They'd take the tools and the bags and all of the paraphernalia that we had brought down there, so all we had to do is just relax and decompress.

And it was kind of a bumpy day on the ocean that day, and so I was kinda concerned about us breaking the surface at the 10-foot mark. And so I also, in addition to wearing the Unisuit, which also has buoyancy control, I was also wearing a buoyancy compensator. So I dumped all the air outta my suit, thinking that I'll just use the compensator to remain a little bit negative so I don't float up.

Well, I was enough negative where I was holding on to the bar with my right hand, and any air that was in my suit flowed up and filled up my right arm with air. And of course, I had a little suit squeeze going on in the rest of my body.

Well, it was cold. My hands were numb, and it was just a cold thing, and we were there probably 15 minutes, and then it was time to go up. And I was responsible for the decompression time for my team, which was Steve and John. And so I said, "Okay, it's time for us to go up," and started

going up. When I hit about 5 feet, it felt like my left arm got about five times its normal size. I thought, “Oh, this isn’t good.”

And so we got on the inflatable, and they took us back to the *Pisces*, and the first question that Bob would ask any of us after a dive is “Do you have any symptoms?” And I had to say yes, and [45:00] so we sat around talking about it: “Well, okay, what do we do?” And Santilena wanted to call the helicopter, have it come get me and bring me to a recompression chamber, but we discussed that, and I thought, “Oh, that’s great. Second dive. We’re trying to get notoriety for Cordell Bank in a positive way, and a guy gets bent out there.” And also, here I was – my livelihood was teaching people how to dive, and it was like, “Oh, great, dive instructor gets bends at Cordell Bank. That would’ve been really good headline.”

So we thought, well, you know, are there any other symptoms? So Santilena and Kruse and the five of us sat around talking about it, and being that none of us had experienced that, we thought, “Well, maybe you just strained your arm. We were banging away on the rocks down there. Maybe you did something.” And so we thought, “Well, if it’s a pressure problem, if you go back down, it’ll go away. If it’s not a pressure problem, it’ll still hurt.”

So I geared up again and went back into the water, went down to 40 feet, and it went away. And I thought, “Oh, no.” And so I stayed there till that tank was almost done, and then the guys brought me another tank, and I went to 20 feet, and I was there about 40 minutes, and we figured maybe I could soak it out. And Santilena brought me a bottle of pure oxygen and stuck the hose in my mouth alongside the regulator. That froze my tooth and popped out a filling, and it’s very dry. I wanted someone to – they kept bringing me notes, jokes. I’d be down there, and they’d be – Santilena would draw a picture of a naked lady or something. You know, just trying to keep it light.

So then we came up to 10 feet, and I decompressed. When I got back up to the surface, it didn’t feel like it did before. So we thought, “Well, maybe we nipped it in the bud.” So I got on board, took some aspirin to thin my blood, had a couple beers on the way back to port – it was like an eight-hour ride back. By the time I got back, I was fine, so it was just – I lucked out. We called it, what, niggles or something, or some kinda weird

form of decompression sickness, but only one arm got bent. The rest was fine, so it worked out.

Dewey Livingston: Your reputation was intact.

Dave Cassotta: Yeah, no one had to know, and we swore we would never talk about this again. *[Laughter]*

Jennifer Stock: Until today.

Dave Cassotta: Until today.

John Walton: We did pretty much everything you're not supposed to do when you have symptoms of the bends. Back then they had what's called a soak-out where if you missed your decompression stops and showed no symptoms, you could get back in the water, take a tank down, breathe out at 30 feet, and then make your stops. But he was showing symptoms, and we still put him back in the water. It was something we shouldn't have done, but it worked.

Dave Walls: Continuing on with the story about the decompression sickness, as John said, we had a lot of folk remedies going on then, because we weren't that advanced, really, in this kind of diving. But obviously, the thing that really saved the day is we had that common knowledge that beer –

Dave Cassotta: Yeah, beer.

Dave Walls: Yeah, it kinda overtakes the nitrogen bubbles. Common knowledge.

Dewey Livingston: Hey, we are learning something today. *[Laughter]* Okay, we were talking about more generalities and getting involved with the expeditions and what your roles are. Is there anything else that comes to mind before you move on to specific dives that you might have a story about? I guess one of the questions here was, did you experience many dives that were cancelled because of weather? Was that a problem?

John Walton: We would leave Alameda and go out to the Gate and head up to Drakes Bay and dock at Drakes Bay and then go from there out to the bank. And we always had a bet going that – how many times Breck Greene would turn the boat around and Bob Schmieder would run up to the cab. The

boat would turn back around and head back out to Cordell for about five minutes, turn around and come back. Bob would run back up to the thing and get Breck to turn it around. And so we would have a bet, how many times are they gonna turn around this trip? There were many trips where the seas were really rough, and we'd get out [50:00] about halfway, turn around, and come back, and then spend the night at Drakes Bay and try to get in the morning.

Jennifer Stock:

I have one more question. Dave, you mentioned earlier – Tom Santilena and Bill Kruse, were they the two other main lead planners for these dives besides Bob Schmieder, or was there anyone else that was kinda like a core leader in that sense?

Dave Cassotta:

You know, I'm not really sure, but Santilena and Kruse, they were the two other divers that – I would figure maybe there was 18 total divers that dove off and on. But of the entire group, other than our little close-knit group, those two guys were the ones that I respected the most. They always made the first dive on the bank. They went down. They laid the line out. They came up with the report as to what the conditions were.

So everything we did kinda depended on what they had to say and their success in their first dive, and they were always successful. So they commanded a great deal of respect, but they didn't expect it. So they were humble guys, but very good divers.

Amongst most of the divers, though, most of the people were very science oriented. They were either scientists or students, very much in science, and were not very mechanical people. And our little group was very mechanical oriented. Most of us were blue-collar-type workers, and as I said earlier, John Walton probably had the most education in the marine sciences, so we're able to do a little bit of everything.

Jennifer Stock:

You also mentioned there were some people on board that were there to observe marine mammals and sea birds. Do you remember who they were associated with and what types of observations they were making?

Dave Cassotta:

We kinda made fun of them a lot. *[Laughter]*

They were kind of nerdy and they didn't fit in with the dive group, you know what I'm saying? And they were usually on the upper deck. We would be down below, and we'd see 'em: "Oh, look. There's a –"

Dave Walls: "Harbor porpoise." [*he pronounces it, "haw-buh poh-puss"*]

Dave Cassotta: Yeah. Yeah. "There's a harbor porpoise. Oh, there's a Dall's porpoise," and they'd throw out the Latin name for it and get all excited, and we'd just kinda shake our heads and laugh a little bit, say, okay, well, what they're doing is important too. Kinda lame, but important. [*Laughter*]

And so yeah, I don't remember any specific observations, although there were times – there was a time when we saw what we thought was a school of orcas out there, and we kinda thought that's what they were, because they looked like 'em. But we relied on the marine mammal people to tell us that they were a false orca or –

Dave Walls: Pseudo.

Dave Cassotta: – a pseudo orca or anti-orca. I don't know. It was some other kinda thing, marine mammal. But it was fun having 'em there, 'cause they were a source of entertainment.

Jennifer Stock: I hadn't heard about this aspect of the expedition till today.

Dave Cassotta: Oh, really?

Jennifer Stock: No. I don't remember that.

Dave Cassotta: Well, there was the bird people too, you know.

Dave Walls: Marine Mammal Institute [*sic: Center*] was out there.

Dave Cassotta: Yeah.

Dewey Livingston: And these are non-divers –

Dave Cassotta: Right. They were observing. Yeah. They were out to count how many of the – you know, we'd see a whole pod of elephant seals out there, and I didn't know they went out that far. And they'd all be in a little pod, which

made us nervous because when they're all tied together like that, it was like, "What else is out here making them get together like that?" So we were concerned about sharks, of course. Although we did see some, but we never saw 'em when we were in the water.

John Walton: The marine mammal people – I believe there's a Marine Mammal Institute [Center] in Marin County. And he could tell the type of whale by the spout, by the spray, and he would sit up top, and all kinds of humpback whales. We saw blue whales, the pseudo orca, and all the Dall's and harbor porpoise. But I remember – never forget him being able to tell by the shape of the spray what kinda whale it was.

[End of Audio file 1, time 55:17 total]

[Begin Audio file 2]

Dave Cassotta: I was thinking about Jerry's first trip, and when Jerry Seawell went and dove with the Cordell Bank Expedition the first time, before he had introduced it to us, he was diving with people he had never dove with before, and he was our dive shop's underwater photography instructor, so we knew he was gonna get some good pictures. And he had told the expedition that he was an underwater photography instructor and that he could take good pictures, but they already had people like Don Dvorak and Kruse and some others who were taking some fantastic pictures down there.

So they were wondering how good Jerry's pictures really were gonna be, and I remember when we met them, they kept talking about what a great diver Jerry was and that he was the only one to get 36 out of 36 perfect pictures. And so I never forgot that. I thought, "Well, I'm sure glad he works with us." *[Laughter]*

Dewey Livingston: Since we're talking about that, Jerry, how did you approach photography? Did you have any idea of what you were gonna be facing? How did you deal with that?

Jerry Seawell: In preparation for the first dive, I had no idea what the Cordell Bank even looked like. So I had a 35-millimeter camera, and I said, "Probably the best thing to do is just take a wide-angle lens and just take wide-angle shots, just to get an overview of the thing." And I took the strobe with me,

and – because it was a new environment, because of the depth, with narcosis – on the back of the camera housing, I had to put on a piece of duct tape my settings for different feets, angles, things like that, so I didn't have to think too hard about it once I was down there, and that helped me out.

So I was lucky the first dive came out with every – every shot came out. And my first dive was with Bob Schmieder. I guess he was probably, like, checking me out. We were the last team to go in, and when he came up, he says, “Got no problems with you.” I says, “Well, I think I have some other people that might be interested.” So he was happy with the photos.

Dave Walls: Further on that with Jerry – Jerry, you had some *National Geographic* experience before that as well, and one shot for *Hustler* magazine, right? [Laughter]

Jerry Seawell: That's correct. [Laughter] Yeah, I've had some photos that were published in magazines prior to this, and Dave brings that *Hustler* magazine one up. [Laughter] I won't talk about that, but it was that Lake Tahoe picture. [Laughter] But yeah, I had some experience prior.

John Walton: Yeah, Jerry built his own housing for his Bolex 16-millimeter, and it was heavy Plexiglas. He was always adding braces and supports and fixing this and that. And I remember on a few dives going down there at about 150 feet, hearing “bang, crack, boom,” and he's looking at his – one of his supports would break in his housing, and he'd be looking. But it never flooded, but every dive he was adding new supports or a brace or gluing something in there to make it work, so it worked.

Dewey Livingston: How did you wind the Bolex?

Jerry Seawell: I wanted to shoot some movies down there. That was the day before video was popular. One of the divers had a Super-8, but I wasn't really happy with the quality, so I bought an old, beat-up camera. I found it in San Francisco. I don't know, maybe bought at a pawnshop. I don't know, but it seemed to work.

I built a Plexiglas housing, and one of our test dives, deep training dives we did at Tahoe, I took it down there to test it. We got down about 90 feet, and the sides of the housing were just bowed in, and I figured, oh,

another 10, 20 feet, it'll just implode. So after that little test, I went home and started putting braces and things on it, and then next time we went up to Cordell, I took it down, just biting my fingernails, and it survived. So that's what I used after that.

There was one little incident where I believe a film crew came out, local – was it Channel 7? ABC. And Bob Hollis made this big aluminum housing for their big \$10,000 camera. They got down 10 feet, and that thing was flooding. So I went down with my \$50 Plexiglas housing and even got down to 200 feet with it, or 210, the deepest it went, and it functioned perfectly. So I was very happy with that.

[End of Audio file 2, time 5:42 total]

[Begin Audio file 3]

Jennifer Stock: So we're gonna move into the diving experiences a little bit on this part, and so I'd like each of you to describe the dives that you did on Cordell Bank. If you can remember specific dives and specific events that happened, that would be great, and then you have a list here of things to refer to, but certainly add anything you'd like. And I guess we'll start over with Steve with his dive log.

Steve Williamson: The first log that I have written here, and I believe it's accurate, would be the first dive we made other than Jerry on Cordell Bank was on October 10th, 1981, north end of Cordell Bank. And I have here the depth the first dive, the top of the pinnacle is 145 feet, and we were down 15 minutes, water visibility 60 to 70 feet. And name of partners was John Walton and Dave Cassotta, which meant that Dave Walls and Jerry were probably diving together as partners. And I believe that John and I were just basically used to collect marine samples off the bottom, and Dave was – I don't know if Dave was using his camera at that time. I believe so, and go from there.

That was the first dive on Cordell Bank, as I remember, and for me it was an awe-inspiring event that was incredible. You're going down, floating down the descent line. What I noticed was that we were staggered as we're going down, and you can actually see each other 10, 15 feet apart. And as we reached the bottom, you could see the bottom coming up at you, and it was more of a kind of a greenish haze at first, and as you got

closer, then some of the colors started coming out, and then the marine life and the abundance of juvenile rockfish and the hydrocoral is what caught my eye.

Jennifer Stock: How about Jerry? Since you dove there first and reported back to everybody, why don't you talk about your first dive?

Jerry Seawell: My first dive was – at first I was a little, of course, nervous, apprehensive, 'cause I wanted to fit in with the group that was there and prove that I was worthy of my skills. And I remember jumping off – basically being pushed off the boat. That's what they did, 'cause you had to sit on the edge of the boat, and they'd hold on to your yoke, your tanks, so you didn't fall in too soon. And as the boat would cruise by the buoy, then they'd tap you or push you.

So I went in, and I went with Bob Schmieder. Got in. The Zodiac – the safety crew handed me my camera from the Zodiac boat. Bob gave me the thumbs-up, ready to go, and I told him, "Sure," and we went down. There was a current, a pretty good current, and I had to pull myself down at least 30, 40 feet. And at that distance, 40 feet away I could see the top of the peak, just the outline of it. I was going, "Holy cow, I can see it from here."

And as I got closer, I noticed the current decreased. It was pretty just awe-inspiring, and then the amount of fish. The first thing, I saw stuff moving, just like amoebae. Didn't know what it was, and then as it got clearer and clearer, I saw all these rockfish, and literally had to push 'em outta the way, swim outta the way. And then once you got through them, I saw the bottom and the hydrocoral, and I just – it would just inspire. I had to sit there for a minute, just take it all in before I – "Oh, I'm supposed to take pictures." So I mean, there was a good minute or so I was just looking around and forgot what I was supposed to. But I was just so impressed.

And then we timed a 15-minute dive. We get the thumbs up. We both checked in our watches. I started coming up, and I just said, "Man, I have to leave already? It just seems like I just got here." And I didn't wanna leave. I just wanted to stay down there. But I said, "Well, there's another day to come back." So yeah, it was probably the most impressive dive of my life.

Dewey Livingston: And were you on the second dive, then, that Steve just described, that same year?

Jerry Seawell: Yeah.

Steve Williamson: They dove that – Dave Walls and Jerry probably were dive partners. But they would do – [5:00] a lot of times we would go in in groups of five, but we would be in pairs of three or two, with separate tasks or at separate times.

Dewey Livingston: Since you have the mic, do you have something to say about that?

Jerry Seawell: Yeah, I think the first year or two that we dove as the five of us, I believe we dove in two-man teams, and so John and Dave would go down and collect specimens, and then the next team would go down, get some more specimens. And I'd be hooked up with Dave and later on with Lew Stark, and then I would take photos while the other one collected samples. And it was kinda like collecting samples was, like, ad hoc, I mean, at first. They just use a goodie bag. You just start scooping. And then as you're coming up, you see stuff trailing out. The small sediment would trail outta the bags, but at the time, that was what they were using, and then we had to find a different way to do it. So basically, that's...

Dewey Livingston: First dive?

John Walton: Boy, and I remember being really nervous sitting on the side of the boat, 'cause you're 20 miles out to sea and there's usually a fog bank. You can't see shore, so it's pretty intimidating looking down.

I remember Bob giving us the – getting prepared for the dive, getting your gear hooked up. He would give us a little rundown of what he wanted. He wanted us to collect as much as we could, typically fist-sized, pieces of hydrocoral or tunicates or any of the sponges, anything that we saw, and to try to cover the whole transect line.

The first dive I don't have a lot of memory of. I do remember I was really impressed with the dropping down through the gloom and then seeing the bank kinda pop up at you, and the fish. I remember diving down through olive rockfish and literally having to push 'em out of the way. They were

just all around you, just like all over you. And once you broke through 'em, you could see the bottom and get down on the substrate.

I have more recollection of other dives that I did later on. I don't know if you wanna go into that now or wanna just continue – I do remember sitting on the rail, waiting to go on one particular dive, and I think Jerry and I were there, and a couple blue sharks swam by underneath us. Bob was holding us up on the boat, on the rail. We watched – getting ready to – buoy's approaching. We're getting ready to jump, and here come these sharks, and Bob taps us on the shoulders: "How do you feel about diving today?" [*Laughter*] "Let's go." So we hit the water and did our dive, and it's just another spectacular dive. But there were times on the bank where you could see over 100 feet and other times where the visibility was terrible.

One particular dive – can't remember what we were gonna do that dive, but the currents were so strong that we came down the descent line, and we actually – the currents were pulling us off the pinnacle. We came in on the pinnacle, below the pinnacle, so the line had actually sank down, and we were coming up to the pinnacle, so the currents were so strong it pulled the line straight out.

Other dives – I don't know if you want me to go into all the rock dive and all that stuff.

Jennifer Stock: Sure, go ahead and describe what's coming to mind for you in terms of diving overall.

John Walton: The biggest thing was the marine life, I mean, just foot-thick marine life everywhere you looked, especially on top of the pinnacles. And later on in the expedition, Bob gave us the project of getting sediment. So Jerry and I would drop down into the channels between the pinnacles and get sediment, and Jerry would take the pictures while I'm doing the sediment. I remember a lot of narcosis. We'd go down – I think our deepest dive was 210. And just to concentrate on filling the bag, fill the bag and breathe, and then hook the lift bag up and send it up.

But one particular dive, Jerry and I came up out of sand, collecting sediment, and we had a little plan to – Dave Walls had stayed up on top of the pinnacle, and so we got up, came up out of the crevice and up to the

top, Jerry pulled out his knife, and we did a little fake knife fight.
[Laughter] I know Dave was rather shocked to see what – [Laughter] I'll go ahead and pass to Dave. [Laughter]

[10:00]

Dave Walls:

Further into what John was talking, as we were doing a – our task for the day was to actually measure and map a crevasse that we'd come across. And as John says, the top of the crevasse was about 170, I think, feet, and down at the bottom was 210.

And I was at the surface drawing the map and measuring out distances across all of that and I think, like everyone else, would deny that we ever got narc, narcosis, and was drawing and then saw these two figures raising up from above the abyss over the edge of the cliff and literally struggling with each other, knife fighting, like they're knife fighting. And I started laughing so hard I dropped my regulator, I swear. It was just amazing. Yeah.

John Walton:

We like to keep it light.

Dave Walls:

Yeah. Yeah.

Jennifer Stock:

How did you report that to Bob?

Dave Walls:

I didn't. I didn't. I might've mentioned – well, in talking about narcosis, it occurred to me while I was talking that one other experience that brought it to life for me with narcosis was we had discovered some holes that were manmade you may know about. They were drilled into it. Well, on one of the dives early on, after finding the holes, I was tasked to go down into one of the holes. It was perhaps seven or eight feet deep, maybe five feet wide. And the idea was for me to collect sediment, thinking about things that died and fell into this hole. But with the narcosis, I can remember digging into that sediment, thinking to myself, "I'm gonna get one more scoop, and there's gonna be a brass door there with a porthole and somebody looking out at me." [Laughter]

Dan Howard:

I'm just curious, did you guys have a set amount of air that was, like, the drop-dead, like you have 1,000, 1,200 pounds or something? Did you establish something like that, or was it strictly a time thing on when the dive was done?

John Walton: We knew a relative depth we're going to. I believe it was 1,000 psi we would return. With twin 80s, that's quite a bit of air. The average dive was, what, 15 to 20 minutes depending on our depth, with sometimes a three-stop dive, 30, 20, 10, for decompression. But we definitely had a dive time. We used the Navy tables, and we had a planned time or air, and it was 1,000 psi to leave the bottom.

Dave Cassotta: Because of the tasks that had to be done, and dealing with nitrogen narcosis, I know when John Walton and Steve Williamson and I dove together, their task was far more involved than mine. They had to collect samples, and many times the request was for – especially later on in the expedition – for specific samples, which means they had to look for a particular species and collect it, or sediment or whatever. So they were very busy trying to get as much done in a short period of time as they could, so I only had three and a half minutes of film. And so my film, I would try to be careful with it and not use it all up on one item, but it would go very quickly.

And so the rest of the time, my task was to help monitor our air supply, keep track of the time, so that – I mean, they took care of their own responsibilities as far as time and air, but having someone else looking at it, too, helped beat the narcosis effects and made sure that we had safe dives that way. And so we all kinda looked out after each other, and it just worked out real well.

Dave Walls: I just wanted to say, following on what Dave Cassotta said, that I remember one of my first impressions diving out at Cordell Bank was, I was really impressed with the group of divers, how well they handled really some fairly complex tasks, given the narcosis that had to be going on at that.

John Walton: One of the biggest things that helped me with the narcosis were the strobes on the ascent line. A lot of times when we dropped down in these crevices, into the sediment fields, under heavy narcosis, I mean, just getting down and digging for a few minutes [15:00] and then looking up, you're lost. You don't know where you came down from, which direction. Was it this side, that side of the pinnacle? And to look up and see that strobe flashing was like, whew, boy, it really felt good to know where you were going. So the strobes were an absolute must for diving out there.

And I remember one dive, Bob sent Jerry and Lew down to set the strobes, and so I believe I was following ‘em down. I knew what was going on. And so they got down. We would set them, I think, halfway down and then a quarter way down and then right at the anchor. And so Jerry and Lew duct-taped some Stroh’s beer cans on the ascent line. And they go through dives and come back up, and Bob said, “Well, did you set the strobes?” “Strobes? I thought you said set the Stroh’s.” So they had taped beer cans to the ascent line. *[Laughter]* So we liked to do that kinda fun stuff. *[Laughter]*

Jerry Seawell:

Yeah, to keep things light, we always had pranks on each other. Lew and I, we had gotten a case of Stroh’s Light. And of course, we had some empty cans from the day before. When Bob asked us to put the strobe lights on, that’s when we came up with this idea, Stroh’s Lights, and so we taped ‘em on. We had, like, three cans or so. And so when the dive team – we didn’t tell any dive team after us about it. They’d come up and they go, “What the...?” *[Laughter]* And so yeah, we told Bob Schmieder, we said, “Yeah, we thought you said Stroh’s Lights.” So that was one of our little gags. Every trip, we had to have a gag.

There was one dive where I was diving with Lew Stark, and it was getting near Halloween. And so we went and bought some rubber masks, and we hid ‘em in our gear and we did our dive. And then we’re on the – come up to the decompression T, took our masks off and put these rubber masks on. Mine was like a gorilla, and Lew had some kinda, like, a green monster. And then the safety team would come down, and they’d just look at us like, “What the...?” *[Laughter]* And then when we surfaced, everybody on the boat was like – they’d look over at us like, “What...?” *[Laughter]* So yeah, every trip we had to have some kinda gag to outdo the next one.

John Walton:

I believe it’s probably still there. There’s a banner down there that says “Welcome to Cordell Bank, courtesy of the Sacto Team.” That was rolled out in one dive and laid on top of the pinnacle. So kind of “Welcome to Cordell Bank.”

Dewey Livingston:

A technical question. Maybe this is a stupid question, but the strobes, I’m assuming, were battery-powered strobes that would just be hooked onto

the line. And one of you had mentioned your bag of sediment being pulled up. How did you communicate? How did that work?

John Walton:

We would drop down – we started out mainly just collecting biological samples, and then as time went on, Bob wanted granite rock, and so we worked on granite rock with a chisel and a hammer, and it didn't work very well. So the following dive or year – I can't remember; it's kind of all blended together – we did a dive with a pneumatic hammer and went down and we were able to chip off a bagful of granite rock.

The sediment was down in the channels. Later on in the dives, he wanted more sediment because of all the micro-gastropods and all the stuff in the sediment; they were finding new species. So he really wanted to concentrate on the sediment, so we would drop down in these deep channels. At first we used air lifts, and we came up with three air lifts with bags tied to the end, and we would use an upside-down 80 on the back of our triple set of tanks, hooked the air up to the air lifts, and used the air lift to fill this bag. We'd get down deep in the sediment. Turned out to be probably more trouble than it was worth. But it worked. We got a lot of samples.

~~And~~ Later on, we just used goodie bags and would just go down and scoop the bag up. We had an extra tank with a lift bag, and I would clip the lift bag onto the sediment and just fill it and send it up, and then the safety divers would collect the bag at the surface and pull it on the boat.

Dewey Livingston:

The bag wasn't tethered to anything, so it would show up wherever the current took it.

[20:00]

John Walton:

Yeah, we were on the transect line. We were within a given area. But you could tell. You could see the bubbles, and they knew where it was gonna come up.

Dave Walls:

I mentioned, while we were diving out, usually we would have a boat that was fixed at the descent line at the surface and then have a live boat that was rotating, staying, in case one of us popped up or to retrieve the lift bag.

Jennifer Stock:

So did anyone want to talk a little bit more about any of their diving experiences in terms of marine life and ascent/descent and currents?

Dave Walls:

I mentioned a little earlier that one of my favorite experiences with the whole Cordell Bank – with the first few times, certainly, of making the dives – was the descents. The experience, especially given the amount of time it took to get to the bottom, of just getting into a skydiving position and literally flying down, perhaps rotating around the descent line. And I remember in my first experiences – I don't know if it was the first dive; probably – that I had the sensation that I was looking virtually into the abyss. It just went dark blue, and there was nothing below. And then as others have described, would faintly see something down there. And then as you got really close, just the explosion of color, just color everywhere, which was a total shock given the depths that we were going to. Really loved that. Didn't like the ascents too much because it took forever, obviously, and worried me at points, where is the surface.

Dave Cassotta:

I think the descent, especially my first one, was probably the most exciting because you had no idea what to expect. We've seen the photographs. We've talked. We've heard all of the briefings and what to expect, what the task was supposed to be. You're trying to visualize what to expect as you're going down the descent line, and as you're passing the strobes on the way down, you can feel the pressure increasing. I mean, you have to equalize, but you actually feel some suit squeeze and so on on the way down, so you know you're getting deep. And it's dark. Generally, it's getting pretty dark.

And you go through the first group of marine life and species that are on the surface, like jellyfish and so on, and you pass through the layer of that, and then you get down a little further and there's nothing. And then you see this real dark outline, and okay, there's the bottom. And so you go to land on the bottom, but there's no place to land without crushing something, because it is just covered with hydrocoral and sponges and a variety of other marine life and, as was mentioned earlier, all of the fish, the schools of rockfish, and some of 'em huge, that we don't normally catch when we're out rockfish fishing or so on. Some really big fish. And lots of juveniles too, a lot of juvenile fish.

I think one of the coolest things is being a cinematographer and having a movie light. You only have about five minutes of light and then the battery goes dead. So you're conserving light, and so you get near the bottom, and everything looks kinda dark. You can make out some colors,

like Dave was saying, which was surprising that you could see color at that depth. But then when you turn the movie light on, which is much brighter than your average underwater flashlight, and it just lights up. Just the color was phenomenal and was like nothing I had ever seen before.

And as I said, as a group we dove all over California and in the tropics and other places, and we thought we'd seen everything in California. I mean, how many times can you dive Monterey and see the same thing, or Fort Bragg, over and over? But to get out there and see stuff that we had never seen before was just unbelievable.

And as Jerry was saying, you didn't want to have to end the dive. You wish you could just hang out there a little longer, that it was a safer environment or that there was a place like that you could go up on land where you could see stuff like that. But you still – being the creatures we are, we had to head back to the surface.

Jennifer Stock:

That brings up a good question I had in terms of the similarities and differences between other sites that you've dove in California. Cordell Bank sounds completely unique. Was there any other dive sites along the coast that were sort of similar or had some similar species? And maybe you can describe those.

[25:00]

Dave Cassotta:

I think probably the closest to just having some of that would be some of the pinnacles off of Carmel down in Monterey. We used to run recreational dives to a place we called the Pinnacles, and in some of the deeper parts of that area, there was some hydrocoral, although very small in comparison to Cordell Bank. And also, it's a well-dove area, so it's been looted, as you might say. But that would probably be the closest that I had seen in California to what you might expect at Cordell Bank.

John Walton:

Similar place – I didn't really get to dive deep – was Arena Rock. Seemed quite similar, but it's a much shallower deal. The other place was, I was fortunate to dive with Dr. Schmieder on Schmieder Bank down at Point Sur, and the pinnacle, Jerry and I went on that. The first dive was pretty amazing, very similar to Cordell Bank. Huge hydrocorals, huge fans, sponges. Similar depth, similar visibility. Not the life of rockfish and juveniles, but just the invertebrate life was amazing. Very similar to Cordell Bank.

Also, on the ascent in Cordell Bank, I was really amazed with the life in the – I guess you'd call it pelagic life, the salps and the ctenophores and the jellyfish, cnidarians, that would come floating by you when you're on the line. Just amazing, beautiful, like creatures from another planet. The ctenophores with the colors, and the salp that would be 20, 30 feet long, these huge chains would float by you. Just beautiful.

One of the dives I really remember was one of the deeper dives – Jerry and I dropped down to the sediment. When I hit the bottom, the bottom was crawling, and it was – brittle stars were just – I mean, the bottom was alive. And when you're narced, at that depth, to see that, it's kinda hard to get a grasp of what you're looking at. Thousands of little arms sticking up outta holes in the bottom. That was really something. I'll never forget that.

Jerry Seawell:

Like John was saying, when we were decompressing on the T-bar, like he said, you'd see all this marine life drift by, and so it was giving you something to look at and do while you're waiting for your time to come up. So it helped pass the time.

Other times, we saw sunfish out there swimming in the distance. And one time particularly, a dive where Dave Walls and I were decompressing, we had about a five- or six-foot blue shark swim around us, and he kept circling us. And you could see his eye going up and down, left and right, and I think he was checking Dave out there. He's looking at him like a stuffed turkey with little ends on the feet there. But like John was saying, the marine life you would see drift by was worth the dive itself. Helped pass the time.

Dave Walls:

Yeah, it was kinda interesting. I know the first few times that I saw sunfish out in the distance, I was absolutely sure it was a shark, judging from the distance. But it was interesting, on the dive that Jerry and I did, when we spotted this shark swimming around us – or he said, yeah, the neat thing about the blue with the white around the eye, you could see the eye moving up and down. I actually thought to myself, “Well, he's gonna think that he's not that hungry,” when he was watching me.

And didn't we discover later on – Jerry was filming all of this, and discovered later on that, actually, you spotted on the film that he was there

during our descent as well, so he may have been following us through the entire dive, and we weren't aware of it; I'm glad. Yeah.

Dewey Livingston: Was there a real danger with sharks, with the blue shark, for instance?

Dave Walls: I don't know. I never had a feeling that I was in danger. They seemed curious, but I never sensed that they were aggressive. I don't know that I was ever really fearful when we were under.

Dave Cassotta: I would agree with Dave Walls. I think for most of us, we'd all grown up with the Jacques Cousteau series [30:00] on television and seen them with a variety of different sharks. And then our experience as divers, the blue sharks were really not man-eaters or known for shark attacks.

And in fact, when John was talking about the time when he was sitting on the gunwale, waiting to go in, and the blue sharks went by, well, he asked John and I think it was Jerry, "Are you up to diving today?" But then he said – someone else said, "Oh, there's sharks in the water." And then Steve and I and Dave were getting our gear ready for our turn, and we said, "Well, what species?" And they said, "Blues." "Oh, okay. No problem." So we weren't worried about that, and when we got in the water, on that particular day, they went away. But yeah, when they're around, they really weren't that interested, but it was the other specie that we were really concerned about.

Dewey Livingston: Any sighting?

Dave Cassotta: We saw great whites on a – was that a survey? Yeah, John was there, and a friend of ours was there, too, taking pictures. He got some really good pictures, so you should talk to John about that one.

Jennifer Stock: That was at Cordell Bank?

Dave Cassotta: Yeah. I don't know if it was at the bank or on the way out. Here, I'll pass it over to John.

John Walton: I don't remember the year, but we had done a survey trip out of Bodega Bay, and Bob had chartered a boat, a fishing boat, to go out and do – back then it was Loran C, but we didn't have satellite.

So we went out and did the survey, and on the way back we saw a very large triangular fin. We were probably halfway back from the bank to Bodega. A big three-foot fin sticking up outta the water. So we swung over the boat to it, and it was about a 15-foot white shark that was basking. I don't know if he'd just eaten, but he was just underneath the surface and really didn't care much about our boat. We got right up to it. The boat actually bumped it, and he kinda gave a big swish with his tail and moved off. But it was a very intimidating fish. It was a big fish.

I was lucky enough to see a white shark eating a dead gray whale in Monterey Bay in '87. It was a different – with Greg Remick. And we saw this shark come up and eat this whale. This is not the Cordell Bank, but I wish I had had a video camera. We watched it for about an hour, eating this whale.

We called the Coast Guard because it was floating in to the Cannery Row area. They came out and grapple-hooked it, and when they got there, there were two sharks: one 15- and one 20-foot shark eating this whale. It was pretty spectacular – I have a picture at home. Not Cordell Bank. Different story. *[Laughter]* But we did see one on the way back from Cordell.

Jerry Seawell:

There's a couple dives where we saw multiple sightings of blues, but they were smaller, juvenile size. And I know some of the safety divers were a little apprehensive to go in and retrieve some of the gear. They had their – voiced their concerns. But we reassured 'em that those are just blues, don't worry about it. But they were a little worried.

Dewey Livingston:

So tell us about the safety divers. I don't recall that Bob or anybody really mentioned them, but it sounds like they just stayed shallow. Tell me how that worked.

Jerry Seawell:

Well, the safety divers would have – one person would operate the Zodiac. Then you have one diver, a safety diver on board, fully geared up, and their job was to – before we'd go in, we'd hand our gear to them, and then they would stage it in the boat. And then once you jumped off the dive boat, you swim over to the buoy, and they'd have your gear handed to you, and you would make your dive. When you came up, they would – they could look you in, and they see the ascent coming up. They would go down – the safety diver would go down and grab any gear you had, so your hands would be free during the decompression. And basically,

they're in the water, in and out all day long. And I think they would rotate the diver and the Zodiac operator.

Dewey Livingston: Okay, so they'd still be the same divers who would do the deep dives too. Just rotate?

Jerry Seawell: No. Because he was diving in and out, it would mess up the decompression if they did it. There was times that we would rotate and operate the Zodiac ourselves. But once your dive was done, you were done for the day as far as diving.

John Walton: There were a group of divers for a few years that didn't wanna do the deep dives – [35:00] Doug Niessen and a couple of the other people. I can't remember their names, but they had no interest in diving down. They stayed up at the boat in the buoy on the safety dives. And I think the last year we were out there, they finally got down there. There was a group of the safety divers that decided to go – it was one of those El Niño years, and it was just beautiful, flat, 100-foot-plus visibility. So everybody got a bottom dive at Cordell Bank that year.

I have one recollection of Dave Walls on a dive. We were down about 150, 160 feet on top of the pinnacle, and we had come down, we'd just settled down on the bottom. I think Jerry and I were gonna go, I don't know, do something, take pictures or do a knife fight or something somewhere. But Dave came up to me, and his eyes must've been as big as saucers, and he showed me his air gauge. And every breath he took, it went from 3,000 to zero, boom, and then slowly came back up, 3,000 to zero, and you could tell he was really nervous. And so he gave me the up sign, and we were close enough to the ascent line where he – okay, he's gonna go up, so he immediately went up, and we're hoping Dave's okay, but he might have a different perspective on that one.

Dave Walls: Yes, yes, I remember that dive very well, and I was really caught off guard. We hadn't been down that long to have burnt up that much air, but as John says, checked my gauge and noticed that I'm way down low and actually moving the gauge with each breath. And again, with narcosis, after signaling John, I immediately started up but caught myself going up way too fast, hand over hand, but only about ten feet. And then it occurred to me – I'd read somewhere that sometimes with narcosis, every once in a while you just get this moment of terror for no particular reason

and that the recommendation at that time was to stop whatever you're doing and just hug yourself for a while.

So I did that. I stopped on the line and hugged myself, and it actually passed. I realized what was going on, and made it up to the decompression stop at the right rate of ascent, did my stop and got out of the water with 200 pounds. Now, John, you looked at my gear and found that –

John Walton: The filter in the first stage – it's called a cinder filter – he didn't properly clean his gear, and he had a dirty filter [*Laughter*] that, with the density of air at that depth, the deeper he went, the thicker the air got and the less air went through the filter. So he was actually drawing the air out of his intermediate hose to zero, and it was coming back up as he was exhaling. Not something you wanna do at 150 feet. Pretty nerve-wracking.

[End of Audio file 3. Time 38:01 total]

[Begin Audio file 4]

Dewey Livingston: We're back for an afternoon session with the Sacto Team. And if we could first clarify the dates that you were diving, we talked about '79 and had read from the log in '80, and maybe Steve, could you give us sort of another rundown on dates?

Steve Williamson: John Walton brought to my attention that in 1980, I believe, we made two dives in the fall that year and missed the rest of the dives due to weather. In 1981 we started – our first dive was October 10th, 1981, and dove that year, and then in 1982, according to my log, our first dive was October 9th, 1982.

Dewey Livingston: And you did continue diving up until the mid-'80s, or '86 or '87, or is this it?

Steve Williamson: I had one dive in '83.

Dewey Livingston: And how about the rest of you?

John Walton: I believe my last dive with the expedition was in '87 at Point Sur, but we had dives on Cordell Bank in '84 and '85, I believe. I think my last dive was in 1985 on Cordell Bank.

Dewey Livingston: Steve, do you have more that you can read out of the log?

Steve Williamson: Yes. If you wanna start when we built the dredges to dredge up the sediment –

Dewey Livingston: Sure, and if that fits –

Steve Williamson: Yeah. The Sacto Team, we put together, I believe it was three dredges. I believe they were inch and three quarters diameter. And we used a basic airlift philosophy as to compress the air at the tube. As it rises, it would create a suction and pull the sediment up, and we collected 'em off a 90-degree elbow with a burlap sack. And we had one person running the dredge while the other tended the sack, and once the sack was full, they would lift it to the surface with an airlift.

Dewey Livingston: Did you invent this – I mean, you came up with the design for this and tested it –

Steve Williamson: Yes. We came up with the design, kind of a group effort. We knew about airlifts. I covered that in my commercial dive school that talked about airlifts. And we actually tested at the...

John Walton: Cassotta's pool.

Steve Williamson: Originally, and then we took it to D.L. Bliss in Tahoe.

John Walton: Oh, that's right.

Steve Williamson: And we tested it I think about 80 or 90 feet, and made some adjustments to it. And I believe we tested it as well in Folsom Lake once.

Dewey Livingston: And the air supply with these is one of your standard tanks?

Steve Williamson: It was a third 80-cubic-foot tank that was – I have a picture of what it looked like. You can see the third tank upside down there.

John Walton: We had twin-tank manifold, and we took a third 80 and turned it upside down and strapped it on the back of the two tanks with the air hose coming around our waist, with a quick disconnect.

Steve Williamson: The first dive that I have recorded is on October 10th, 1982. I have a depth of 140 feet, downtime 16 minutes and – oh, correction. The correct date on that was October 23rd, 1982. Depth 160 feet, 15 minutes downtime, and we used the two-inch dredges in a crevice approximately 40 feet across the transect line. We had to use the Scuba Pro Mark V First Stage. Worked better than the Poseidon, we determined.

The crevice at canyon was 20 feet by 40 feet. The top of the ridge was 130 feet long. The crevice was 160 feet deep. And we dredged up sediment and sent it to the surface. And we saw five killer whales that day; they ended up being the false. Killer whales and a six-foot blue shark.

Dewey Livingston: And when you say the crevice is that deep, that's below the pinnacle.

Steve Williamson: Correct.

Dewey Livingston: So you couldn't go to the bottom of the crevice, could you?

Steve Williamson: We did go to the bottom. The top of the pinnacle was – what'd I say it was? Yeah, the ridge was 130 feet, and the crevice was 160 feet, so we descended another 30 feet [5:00] to the bottom of the crevice where we were dredging.

And I believe we only made two dives. The second dive was the next day, October 24th, at Cordell Bank north end. Again, the depth I have is 160 feet. And John and I dredged up 25 pounds of sediment. The 25 pounds was in my mind. I don't know if it was that much. With the three-inch dredge. We had a two-inch and a three-inch.

John Walton: They had names.

Steve Williamson: Yeah. Marilyn, Linda, and I –

Dave Walls: Yeah, yeah. [Laughter]

John Walton: Deep Throat.

Steve Williamson: Yeah. Marilyn, Linda, and Deep Throat?

Dave Cassotta: Yeah.

Steve Williamson: And 10 pounds with the red dredge, so we were working with – this is one of the dives where John Walton, Dave Cassotta, Dave Walls, Jerry Seawell, and I dove as a five-group team. We had two of us tending each dredge, and one was probably Jerry with the camera.

Dave Cassotta: Mm-hmm. We had two cameras there.

Steve Williamson: Yeah. We were on the same ridge on this dive as the Navy hole.

Dewey Livingston: That was when they found the hole?

Steve Williamson: No, we found them prior, but this was the ridge where one of the holes was located. And that's what I have basically for the dredges we made.

Dewey Livingston: Does anybody else want to address that year, '82, and dredges, etc.?

Dave Cassotta: With the dredges, my impression from Dr. Schmieder was that he wanted sediment. And up until this point, we hadn't really gone down into this area where all the sediment was, and so we were thinking he wanted sediment out of some of the cracks and crevices that existed in where all of the abundance of marine life was. And so Steve and John, when they made the dredges, they also had this little fitting that went even smaller to, like, get down into a small hole or crevice to suck whatever is in there out. But then when we realized that actually it was just as easy to go down into the big crevice and, with a big goodie bag, just scoop up the stuff and, like, shoveling it in, that we had definitely overbuilt the concept of collecting the sediment, so we abandoned the use of the dredges after that.

Dewey Livingston: But it was made clear to you why you were collecting the sediment?

Dave Cassotta: Mm-hmm.

Dewey Livingston: Anything else about it?

- John Walton:* Yeah. Most of the sediment deposits were at 160 down to 200 feet that we dove. Bob was real interested in the micro-gastropods that lived in the sediment and all the creatures that no one had ever gotten to. So the idea was to get deep down into the sediment and bring up these, as much finds as we could. And apparently, we found some new species in the sediment.
- Dewey Livingston:* Anything else about those '82 dives that come to mind? Okay, do you have another entry?
- Steve Williamson:* Well, we're actually into November – November 13th, 1982, Cordell Bank, again north end. Maybe that's just where my mind was. They all seem to be on the north end. Let's see. Dave Cassotta, John Walton, Jerry Seawell, and then McCormick and Niessen were safety divers. And purpose of dive: take pictures and Super-8 movies. And that's all we did, I believe, on that. That's when I took down Steve McCormick's Nikonos 3 and shot some pictures. David has a Super-8; Jerry had a 16. Oh, and I have a note here: I wonder where Dave Walls – Dave Walls could not make the trip. That's all I have. I don't know why, but...
- Dave Walls:* Methadone clinic, you know. *[Laughter]*
- Steve Williamson:* Then we had a dive the following day at Cordell Bank, depth 180 feet, downtime 15 minutes, then we decompressed three minutes at 20 feet, seven minutes at 10. And, again, when I was writing these, a lot of it was just off memory at the time. We went down, basically take pictures [10:00] and raise the hammer core for the holes that we took down. We covered those. So we raised those with some lift bags and then took still photos and movies with the 16 and the Super-8. Photoed area where we used the pneumatic hammer, see if anything had come back from the prior year. And I had noted here that the strawberry anemones were the first to grow back on the bare spot. Then I have a continued – John and I dropped over the side of the ridge to a sediment deposit of 180 feet. John collected sediment, and I took pictures. And that was all I have for 1982.
- John Walton:* We found large holes in the tops of the pinnacles at Cordell Bank, and one of our projects was to measure the depth of the sediment in the hole so we could get an idea of how fast the sediment was collecting. So we developed a core sampler with a piece of inch-and-a-half galvanized pipe with a flange that would catch the – as we drove it in, would catch the material and we could measure the depth in the hole.

~~And~~ So we went down to this hole and tried to drive this core sampler down in to collect sediment, and we left it there, and that's what Steve was referring to. In the previous year to this, we had gone down and collected rock samples in that area with a pneumatic hammer, and it cleared the area pretty well. And we knew where that was. It was right next to a hole. So we came back to the hole the following year and looked to see what had grown in the clear spots. And I don't recall exact – Steve says that *Corynactis* were the first ones to come back.

Dewey Livingston: So that's all the logs.

Steve Williamson: That's all my logs. Yeah.

Dewey Livingston: Thinking of dives, anything else that comes to mind – tell some stories, or should we go to the administrative first....

Jerry Seawell: I don't know if I should tell this one on record. *[Laughter]* But the tequila dive.

Dave Walls: Oh, I deny it all right now.

Jerry Seawell: It was Saturday night, and we were in Lew Stark's camper doing tequila shots to about 2:00, 3:00 in the morning. And we got up at I think 6:00 and left, and we actually went diving, and we probably had a, I don't know, point-oh-something alcohol in our blood prior to the dive. *[Laughter]* We don't recommend to recreational divers. *[Laughter]* Kids, don't do this – don't try this at home. But yeah, we went diving with – I know I had a hangover, and actually, the deeper I got, the better I felt. *[Laughter]*

Dave Walls: Yeah. Yeah.

Dave Walls: We didn't tell Bob.

Jerry Seawell: No, Bob Schmieder doesn't know about this. *[Laughter]* Yeah, it was – we came up going, "We'll never do that again." But we survived. *[Laughter]*

Dewey Livingston: Now, since you all knew each other, you probably were associated with each other professionally or recreationally. Did you get together with other members of the Cordell Expeditions outside of these dives? Did you hang around for anything?

Dave Walls: No, I think that distance made it a little bit difficult. Most of the other divers were from the Bay Area, so that was a bit of a drive. So to get together socially would've been difficult.

Dewey Livingston: But I asked earlier about planning meetings for the next year. You sound like that didn't happen.

Dave Walls: No, I think Bob was really good about doing really thorough briefings, and that's how it happened. We wouldn't meet separately to discuss what the dives are gonna be about, or the goals, or whatever.

Dewey Livingston: And I've seen the reports that Bob did. Did he distribute one of those to each of you, or how did you obtain those?

John Walton: Yeah, he would send out a yearly summary, a little packet with all our drawings and pictures that we had done and specifics on the dive. [15:00] Bob used to have dinners and little get-togethers, and we'd go down every now and then to his house. I was fortunate enough to be able to work with Bob and Dan Gotshall in identifying species at the Academy of Sciences. I spent quite a few weekends down at the Academy of Sciences breaking out specimens and putting 'em in bottles, and that was a highlight of my experience also.

Dave Cassotta: The opportunity was always open to us, 'cause we'd hear about "Bob was having a barbecue, and come on down." But like Dave Walls said, that the distance made it difficult sometimes. But John's interest in the marine sciences was his big motivation. He'd head down there, and getting that opportunity – because we used to sell some of Gotshall's books in our dive shop, and so for him to get to sit there and identify species with him was really a highlight.

Really for the rest of us, I can't speak for the other guys, but I really didn't have the interest to go see what a tunicate was. My interest wasn't there. I was too busy trying to run my business and do that stuff, although the opportunity – we were all invited, and the opportunity was there. In fact,

he even sent us all business cards. We all had our own little business card with what we did on there written in Crayola. No. *[Laughter]* And so it was pretty cool, yeah.

Jennifer Stock: Did any of you ever see any manmade damage around the pinnacles that you dove, like fishing gear or fishing nets, beyond the manmade holes?

Dave Walls: Yeah, I think that one of the first real shocks that I saw was the abundance of beer cans out there from the sports fishermen. I thought, here we are in this lush environment and we're at 170 feet or whatever, and here are all these beer cans laying around. Seemed so incongruous and out of place, you know?

Jennifer Stock: And they weren't from your team.

Dave Walls: Not from – none of 'em were from us.

[Crosstalk]

Dave Cassotta: Those weren't Stroh's. Wasn't our brand. *[Laughter]*

Dave Walls: "Oh, my god, were we the ones that threw those out there?" *[Laughter]*

John Walton: As far as any manmade stuff, we saw some salmon weights, large shotgun or the cannonball weights. I saw a few of those and some small boat anchors, but no nets or anything like that. I think some of our banners are still out there and a fish catcher that somebody made one year. Somebody had the idea of making a Plexiglas fish trap – I think it was Vic Ferrari – and set it down there for the weekend and didn't catch any fish. That's all I ever saw.

Dewey Livingston: How about Lew Stark? He's not here with us today. Is there anything to tell about anything that he did or a little about him?

John Walton: Well, we certified Lew. Lew was one of our students we certified, so we've known Lew since late '70s, early '80s. One of the big things that he contributed to was his artwork in Bob's book. He did some beautiful drawings of hydrocoral and some of the specimens that were brought up.

But Lew was a good diver. He did have a pretty serious event on the Point Sur dive, his last dive, where he had oxygen toxicity. The expedition was playing with nitrox, and he went too deep and stayed too long and had an oxygen hit. But he should probably tell that story. It was pretty serious.

Jennifer Stock:

Well, let's move a little bit more into what Bob's main goal was for this entire mission. And at the time when you were on these dives, did you have any idea really what body of knowledge this was contributing towards in terms of where this was all gonna go eventually, versus just collecting stuff and collecting stuff? What were your thoughts on that, in terms of the purpose of the expedition?

Dave Walls:

I kinda agree with Dave Cassotta that [20:00] certainly I, too, was first attracted just the sense of adventure. Just the word "expedition." For us guys that taught scuba, going off the beach in Monterey and kneeling on the bottom while students did skills got really frustrating, because we got into it because we love the ocean, love the marine life and all that.

I know that personally, after just a few dives, I began to understand what I was a part of, and that became the excitement too, that we're doing something meaningful, something that can make a difference. I don't know if I really appreciated that we were going into the direction of having it become a marine sanctuary till later. But yeah, I was glad to be part of it.

Dave Cassotta:

I agree with Dave Walls. While we were doing the expedition, I didn't have any idea what it took to get an area designated as a national marine sanctuary. I wasn't so interested in protecting the area, except for protecting it from oil drilling. Once I saw what was there, I thought, "Oh, this would be a tragedy if this was contaminated by a major disaster."

And being a conservationist and not a prohibitionist, I could see that, as a resource, as a fishery, it was very valuable – it was full of juvenile rockfish – and that I knew there were charter boats going there to fish, and I thought, "Well, I don't want that to stop, but I do believe it needs to be regulated to preserve this." So I started getting more into the idea of what we were really doing.

But really, to be honest, after a while of year after year of doing this, and as was mentioned earlier, we had to pay for it all ourselves. And owning a

dive shop and being called upon a lot, after a while I felt like the Sacto Team was being used. I just kinda felt like, okay, this is the Bob Schmieler expedition; it's not going anywhere. Because I was on the dive side, collecting, taking pictures, but as far as what's being done with that, I didn't really know.

It wasn't till he published the book that I realized "Wow, we really did something, and this could really happen. This could really become a national marine sanctuary." And it wasn't till then that the real reality of it hit me.

Steve Williamson: I echo what Dave Cassotta and Dave Walls said. I don't need to add any more to that. I agree that once the book was published, it began to set in that, okay, this was really for something.

Where it hit me the most – and this was 29 years later, 27 years later – Dave Cassotta and I were at the Fisherman's Festival, Bodega, year before last. And we were walking around having our token beer and corndog or whatever it was, looking at the festivities, and we looked over, and there was a Cordell Bank Marine Sanctuary booth set up. And of course, we were drawn right to it and walked over there and started looking at all these things and the posters that they had and what they've accomplished. And Dave looked at me and goes, "This is what we did this for," and that's when it set in with me personally is that "Wow."

Then the lady that was there – Dave talks more than I do; told her we were divers, and then hence we – at least I gave my first autograph. But that's where it kinda accumulated for me is – or it came up as the – what it was there for. Like everybody else, though, I started off for the adventure and then bought into the reason and the quest for the sanctuary, like everybody else.

John Walton: Again, I did it for the adventure. I mean, how often do you get to go to places that have never been dived in the world and have the opportunity to be the first people to see it? In the beginning national marine sanctuary wasn't even in the picture. We didn't even talk about it. [25:00] We were out there to dive in a really neat place, and as far as biologically, it was a marine biologist heaven. And that's what really interested me was the fact that they started to find new species and range extensions and depth extensions, and it was just an amazing place.

And as time went on in the late '80s, when it was finally given that sanctuary status, no one really knew about us. I mean, we were just divers on an expedition, but you felt proud because you could look out and say, "I was out there, and I saw that, and we did that." So I always felt good about it. No recognition.

But the part that was really fun was the October dinner where we were invited down and given recognition. I was proud of us all, and we did something that was a highlight of my life. And when I pass, that's where I wanna go. I wanna be dumped out on Cordell Bank. So it's a special place.

Jerry Seawell:

When I first started in the expedition, in my wildest dreams I would've never thought it'd end up the way it is. I just thought it was a bunch of wild and crazy guys getting together by a leader who had some visions, but I thought maybe this would just end up being a scientific paper, something like that; it wouldn't go any further. Like I said, I would have never dreamed it'd have been a national sanctuary.

And at the time, it was like – these other teammates here, just an adventure. Fun adventure, see somewhere, and then I felt a little selfish that I've been someplace that the majority of divers and people that have never seen this world, and I've been there and they haven't. So it was a bit of selfishness on my part there.

But once I heard it became a sanctuary, said, "Hey, I contributed something." And like John said, it's a pat-yourself-on-the-back kind of moment. But I never dreamed it was as big as when we came back in October for the get-together, and just the reception we got. I said, "Holy cow. I can't believe this." But yeah, it's something I'll never forget.

Jennifer Stock:

When you were in the years of diving and returning home back to Sacramento, what were some of the things that you told your friends and everybody else back home about diving at Cordell Bank and what it was like? Or maybe even today, what do you tell people about Cordell Bank?

Dave Walls:

Thinking back, I don't think that I talked about it a lot, because it seemed a little fantastic. "Yeah, we were at 170 feet and saw sharks and blah,

blah, blah.” Yeah, right. You know? I think that, if at all, we talked to each other a lot. I didn’t talk to a lot of other people about it.

Dewey Livingston: Any publicity?

Dave Cassotta: I was always trying to promote our dive shop. So using whatever any of the guys did, whether it was John and I who went out to Folsom Lake and brought up a boat for a guy, man, that hit the paper. Or if we had an underwater pumpkin-carving contest, that was in the paper.

And so this we did a press release on as well, and it was published in a variety of newsletters within the industry. PADI published it in their paperwork, and some other magazines and so on published that there was a group of California divers doing this thing. So that was really the only publicity that I was familiar with. And then when KGO joined us on a dive, that was kinda fun to see that. ‘Bout it.

Dewey Livingston: But personally did you rave about it? You came home and told your friends?

Dave Cassotta: The thing was, you have to keep in mind that we were all young, and all of us were married. Now, Dave was going through a divorce, but we had little children. And I remember going out there right after my wife gave birth to – it was like two months after my daughter was born, and then being out there after my son was born. [30:00] John had two kids. Steve had two kids.

And so for our wives, Cordell Bank was a bad word. Going on these expeditions was something that they were not fond of because they were worried about us, for one, because they knew it was dangerous. And two, being divers anyway took away from family life. You know, we were gone on the weekends. We taught classes at night. So having something that we didn’t have to do that we were volunteering for and having to pay for out of our own pockets, they were not happy about that.

So oftentimes we didn’t talk about it at home much. We just said, “Yeah, it was cool,” or “This guy was there” or “That guy was there. We had a good time,” and back to life. And then friends and family outside of our group, they couldn’t relate. They had no way of relating what diving to 180 feet would be like or what narcosis felt like or the excitement of

seeing a *Corynactis anemone* growing back on a spot that we had cleared off the year before. They just couldn't relate, so we didn't talk about it much.

John Walton:

Yeah, I second that. It was hard to relate to other people when you try to describe what you've seen, and it doesn't work. They have to see it in real life to believe it. And so you could just say, "Oh, you should see the marine life. It's three feet thick...." "Oh, yeah, yeah, sure." And half the time you tell 'em you went to Cordell Bank, they didn't believe you, 'cause it's 20 miles out. Or they didn't know where it was, and so what.

So there wasn't a lot of recognition then. We all knew amongst ourselves it was special. And it probably wasn't until we had a Cal Academy of Sciences – we were all invited down where Bob put on a show, and he had a video and a slideshow. It kinda set in that, boy, this must be pretty special because here we are at the Cal Academy of Sciences, and all these people came to see this show. And there were a couple of KGO specials and news articles. But as far as recognition, there was just amongst ourselves.

Jennifer Stock:

So based on your experiences at Cordell Bank and this general region overall and what you hear now in the media about environmental concerns and ocean conservation concerns, what are your biggest concerns for Cordell Bank in terms of the future?

Steve Williamson:

I'll go along with Dave Cassotta in saying that I wouldn't like to see any type of oil drilling or exploration out there for that. And as far as divers go, I know there was some concern mentioned earlier about sport divers going out there, and I believe that there could be some legislation passed that has a moratorium on only – with a license or permitted diving only that would eliminate the sport divers, 'cause it is too hazardous. As far as the fishing goes, I believe that we should have some fishing there, with restrictions and regulations. And as far as anything else goes, I think it should be here for the next gazillion years.

John Walton:

I would be concerned about the big commercial fisheries going out there and gillnetting or doing the seine netting over the reef and taking all the juveniles. One of the amazing things about the bank was the number of juvenile fish. It was like being in a giant aquarium. There were millions of 'em.

And obviously, oil drilling shouldn't be done. There's plenty of places to drill oil, not at Cordell Bank. I don't think it could ever become a sport diving place. It's too difficult to find, too difficult to hit the pinnacle, too deep. Diving's out there only during the fall, during a couple months. I mean, you can't stop people from diving, but I think there should be some restrictions, like Steve said, or special permitting by the sanctuary. It should be protected in that respect.

[35:00]

Dave Walls: We've really pretty much covered what I recall.

Steve Williamson[?]: Yeah, I think I would just be restating what was stated by somebody else. Everybody complemented each other really well on the stories and gave some validation, confirmation –

Dave Cassotta: We've had a lot of life experience, done a lot of things. You take the five of us here, I mean, we could fill volumes of our life experiences of what we've done, and we've all lived fairly adventurous lives. But for me Cordell Bank was the highlight of it all. And really, it's not just the place; it was the expedition and the people involved, because without people, what's the point? So it was these four guys that I've known all my adult life that we share this experience, the closest thing I would have to a wartime companion or being in a foxhole with somebody in an intense situation. This was a great deal of adrenaline and excitement, and these are the four most talented and bravest guys I know.

And I often think of some of the things we did, even not at Cordell Bank, some of the dives we made – one dive in particular, Jerry and I were diving on this boat that had gone down. And he went down head first, and the water was black. I mean, the lights wouldn't work. And he went down head first. It was freezing cold, and I thought, "Oh, god, he's brave. I've gotta follow him now."

So I followed him down. He's down there taking pictures. I could see the flashes of his strobe going off before I got there, so he was already there. And in the years I dove with John where we could just look at each other and know "We better get outta here" or "Hey, this is awesome" or whatever experience we were experiencing. And with Steve and Jerry and Dave Walls, it was the same way. And I couldn't have ever dove with such a great group of people. And then the other divers on the expedition,

too. I had a great deal of respect for Santilena and Kruse and Sue Estey. I mean, what an incredible woman, the stuff that she did. And so yeah, it was really the highlight of an adventurous life.

Dave Walls: I never really cared for any of ya. *[Laughter]*

Dave Cassotta: Yeah. You sucker. *[Laughter]*

John Walton: I just wanna say, Robert Schmieder's a pretty – he's a different kinda guy. And I wanna thank him for giving me the opportunity – us the opportunity to dive on something that was fantastic, and it was a highlight – like Dave said, a highlight. How more high-adventure could you get than diving at Cordell Bank, first people in the world to see it? And thank you, Mr. Schmieder, for that.

Dewey Livingston: Well, I get the sense that he did consider you a special crew because he talked in his interview about – he was interested in getting serious divers who weren't there for the adventure but who believed in what he was doing. And you guys seem to have been in it largely for the adventure, admittedly, and that he saw that "Hey, there is something that I need or that is gonna contribute here." It's that sense of adventure.

John Walton: I think the Sacto Team also added a lot of topside fun, those shenanigans, and it broke the tension, because when you're going out there 20 miles off shore and you think about dropping down 200 feet into the water, your heart races. And it's fun to come back up and relax and break loose with everybody and talk about it and vent. So I think the Sacto Team helped a lot in that respect.

Dave Walls: Yeah, John just sparked a memory for me too. One of the really, I thought, interesting things that I first noticed on the expedition was, during one of the first, or probably my first dive there certainly, the preparation part to where we would be talking and laughing and all of that, and then the word would be this "All right, start getting your gear ready." It would go dead silent. Nobody talked. Right up to the time you're stepping off the ledge. Everybody was rehearsing every move of the dive. That's the only we could do it on the bottom with the narcosis. You've gone through step by step every single moment.

[40:00]

And one of the things, too, I was thinking about while John was talking was one of the things that I took home with me that I appreciated most is the rest of these guys. I know for a fact that we have taken care of each other in Cordell Bank, kept each other out of serious trouble at least a couple times each. I can remember specific times.

Jennifer Stock: Wow.

Dewey Livingston: Well, let's call that quits for the day. Thank you very much.

Jennifer Stock: Thank you.

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[End of interview sequence]

PIONEER DIVERS OF CORDELL BANK
IV

Oral history interview with
Bill Kruse and Tom Santilena
October 28, 2010



Tom Santilena and Bill Kruse

Edited Transcript

Interview by Dewey Livingston
with Jennifer Stock

Interview length: 2 hours, 52 minutes

National Oceanic and Atmospheric Administration
Cordell Bank National Marine Sanctuary
PO Box 159, Olema, CA 94950

Dewey Livingston: This is an oral history interview with two members of Cordell Expeditions who participated in the historic dives on Cordell Bank in the early 1980s. They are Bill Kruse and Tom Santilena. It is October 28, 2010 and this interview is taking place in Inverness, California. As lead interviewer, I'm Dewey Livingston on contract with Cordell Bank National Marine Sanctuary.

Jennifer Stock: And I'm Jennifer Stock, the education and outreach coordinator with Cordell Bank National Marine Sanctuary.

Dewey Livingston: So if the two of you would state your name and spell your last name, please, to get us going.

Bill Kruse: My name is Bill Kruse and my last name is K-r-u-s-e.

Tom Santilena: My name is Tom Santilena and my name is spelled S-a-n-t-i-l-e-n-a.

Dewey Livingston: To begin with, if you would please tell a little bit about your personal background, meaning something like your birthplace and hometown and general education.

Bill Kruse: So this is Bill, and I was born in Palo Alto and I still live there. My father was an engineer and I went to school and became an electrical engineer and designed hardware for many years for microwave testing like my father did. But I got a college degree in electrical engineering and evolved over time so that actually the exploration of Cordell Bank became a way to transition my career from hardware to computer work and computer mapping. And so I find Cordell Bank has been a significant part of my life.

Tom Santilena: This is Tom, and I was born in Alameda, California in 1949. I think I'm older than Bill. And I went to school and was raised in Alameda. I went to college in Berkeley. That's not Berkeley campus, that's Armstrong Business College, and I became an accountant and I've been financial comptroller for about four companies now that I work for. And Bill and I have been friends for 38 years. That's why we kind of stick together.

Dewey Livingston: Did you have personal interests other than diving that might have related to your future diving interests?

Bill Kruse: Diving got us involved with Cordell Expeditions but our interests were in projects related to diving, and all of the things that went together and needed to come together to do a project, versus just going to Monterey and jumping in the water, looking at the fish, shooting a fish, taking a picture and such. Also, I was interested in underwater photography long before Cordell Expeditions and that provided an early excuse to go diving and to travel and it was a great excuse. But as time went on, just going into the water and taking pictures was not quite enough.

Before Cordell Expeditions, Tom and I and several other people actually had a project on our own where we explored a cave, Bower Cave, in the Mother Lode of California, which was first explored by Jon Lindbergh and Ray deSassure back in 1952 and was on the cover of *Life Magazine*. So we found that as something to sort of suck us into a project and we spent ten years diving there and doing I'll say pseudo science. We were not scientists but we were interested in documenting what we found.

We collected a number of new species, amphipod planarian. We had reputable scientists at the Smithsonian and Old Dominion University do the description. So we had some experience in trying to document and do scientific work in the environment of a project exploration and an adventure, actually, to be frank, and it all tied together.

And eventually, when that project ended, we looked for something else interesting to do, which is pretty much how we came together with everybody else, which we'll probably talk about later.

Dewey Livingston: Did you have to have any special training to do the cave diving, which sounds very dangerous to me?

Bill Kruse: We did the training pretty much on the fly as we figured out how to keep ourselves safe. We did a lot of work in the ocean, training dives, actually in Monastery Beach, which we used for Cordell Expeditions, as well, because it was deep and it was dark. It was challenging and we tried out new gear, lighting equipment, and tanks, but of course at Monastery Beach we could surface and in the caves, we couldn't. So we figured it out as we went because we really had no experience before we started doing it.

00:05:20

Dewey Livingston: Anything to say about that, Tom?

Tom Santilena:

Well, for me, in beginning to dive, it was my brother who actually took me on my very first abalone dive in 1967. And in fact an interesting thing is John was also on the first dive with Bill and I, although he didn't show up for that particular evening. So after I went into the service and came back from Vietnam, I had always wanted to be a NAUI instructor and in fact had studied to be a NAUI instructor while I was in the army and came back and did that. So for the next two years, it was all teaching and sport diving, and as Bill said, doubles diving at Monastery Beach and other places to get you ready to do things.

I think that probably an important thing for me and Bill on Cordell Expeditions was we had so much experience using equipment so equipment management was easy for us. Because whenever we went anywhere, you'd load everything up someplace. You'd tear it down to set it up for diving. Then you put it into the water and then you have to tear it down again and then load it back up. So equipment management was something that we through osmosis just had to do.

So after doing all the sport diving and the teaching, I met Bill right after the army and in fact the same month that I got married and he was doing the projects of Bower Cave and that's when we started to get in on the expedition type project type diving. And once you do that, sport diving, I don't know if I ever did sport dive again after that. Everything was pretty much in preparation for whatever we were doing on whatever project.

I think you forgot one project that was worked on and that was the sea otter. That was a big project for you. Bill actually got to tag sea otters to mark their migration patterns and I thought that was pretty interesting. And the other project was the Nudibranch project where we were making a film about a tubeworm and a sea slug and it was really quite a dramatic sequence and we did that for quite a while, too. I would consider that a project.

So there were more projects than just about Bower Cave, although Bower Cave is memorable because if anything goes wrong, you are no long. You're gone. So an exercise in really believing in your equipment because you are at the mercy. We always bought the best because if you put your life on the line, you want the best.

Bill Kruse: So Tom and I actually both became NAUI certified diving instructors at different points in time but that was in our background, too. And that was sort of the transition from just sport diving to semi-professional, though I never really taught and Tom worked a little more at it than perhaps I did, but so we were evolving our understanding of what needed to be done and how to do it over time. We didn't know what we were planning but we wanted to do more than we were doing, so it was kind of the general motivation.

Dewey Livingston: And this was the 1970s we're talking about?

Tom Santilena: '72 is when I started with Bill. Bill had done other projects before. I think Lilburn Cave was before you and I –

Bill Kruse: Actually, it was afterwards.

Tom Santilena: Really?

Bill Kruse: Because we couldn't get access to Lilburn Cave in Sequoia National Park. Paul Hara, who was involved at Cordell Expeditions, and Mike Green and I tried to get access to a cave in Sequoia National Park and we applied, if you will, and they said, "You don't have any experience." So we found another cave that we spent time at and got the experience and proceeded to actually go back to Lilburn Cave and to this date, I believe, Paul Hara and I and Tom and – maybe Tom – and Mike Green –

Tom Santilena: I was never in.

Bill Kruse: Or probably less than a half a dozen people have ever dove in that cave and there are still people looking to dive in that cave and they call me every decade or so, but as far as I know, nobody ever has actually been back in again. So we did some things that were probably beyond our capabilities but we incremented gradually up because we didn't know what we needed to do. And in essence, this was good training for surviving Cordell Bank, I think. Not planned but still coincidentally useful.

00:10:13

Dewey Livingston: For the record, could you spell Bower Cave and Lilburn Cave?

Bill Kruse: Bower is B-o-w-e-r and it's near Highway 120 near the entrance of Yosemite National Park.

Dewey Livingston: And Lilburn?

Bill Kruse: Lilburn, L-i-l-b-u-r-n, and the group that was running that project was Cave Research Associates and Bruce Rogers, who's still involved in caving, is still involved. He used to work for USGS.

Dewey Livingston: Now did you do ocean diving, as well?

Tom Santilena: At what point in time?

Dewey Livingston: Before going to Cordell?

Tom Santilena: Oh, absolutely. We've been diving since 1972 with him and he was diving before we met and I was diving well before we met, so both of us had been diving for a long period of time before Cordell Bank, a long time.

Bill Kruse: I got certified in 1965 and got certified as an instructor in 1969. As many of us get fixated on our hobbies, we were in Monterey almost every weekend as soon as we got the driver's license and so we know every dive site in Monterey, I believe, except the ones accessible by boat and we know some of those, too.

Tom Santilena: That's right.

Dewey Livingston: Well, then getting to Cordell and Cordell Expeditions and in preliminary to preparing for your first dive, could you tell, both of you, how you first found out about Cordell Bank? Had you heard of it before?

Tom Santilena: Well, after we were doing the cave diving, in the record there's a Paul Hara, and Paul Hara had read something in public record that there was going to be a meeting of people trying to get together to do a project, so Bill, me, and Paul went to that meeting to see what it was all about. Was it there that we had to do a resume?

Bill Kruse: It was at the Cal Academy where the meeting was held and I don't remember. You probably have the records, Jennifer. I don't remember the details.

Jennifer Stock: No, but Bob [Schneider] brought it up during his interview.

Bill Kruse: But the three of us from the Bower Cave project came and said this looks interesting and challenging and probably nobody else will be there and there were a lot of people there. And we were sort of like, "Oh, boy. How do we get involved with this competition?" So we all went away and actually wrote resumes to apply to this job, if you will, this project. We were a little crazy at that point in time and perhaps more so than we are now.

And surprisingly, Bob said, "Well, come on over." And I think it had more to do with the fact that we actually came over than the resumes, but we did have some relevant experience and in fact, this may seem a little immodest, probably among the people we were applying to, we probably had more technical diving experience in those days – it doesn't compare to the capabilities now, but in those days, we probably had more deep water double tank dual regulator type experience than anybody else at the time, in this group, anyway. So Bob said sure and the fact that we were crazy enough to keep coming back probably had more to do with it than anything else.

Dewey Livingston: Is that similar, Tom?

Tom Santilena: It's exactly the same. I don't remember Bob all that much but I do remember all the people that were there in their corners and the equipment that they brought in for show and tell. It was presented in an official way and very well done. It wasn't just people getting around and talking about it. There was a purpose involved and the purpose was fulfilled.

Bill Kruse: As we know, Bob can go on – like we are – a lot, and he do so that night and it sounded very interesting and exciting and official, perhaps much more than it really was. And Don Dvorak was one of the people there and had his camera setups out there and we scratched our head and said, "These guys really know what they're doing." So perhaps we were a little snookered but in the end, we all found a way to work together to make everything happen.

It was quite an interesting evening because we were all trying to feel out each other to see is this real – number one, do we want to get involved in this project? Boy, it sure looks interesting but it also looks – there's a lot of unknowns. So there was this tension on do you get involved and is this worth doing?

00:15:12

Dewey Livingston: And my understanding was that meeting was in 1978 preliminary to a 1979 dive? Do you have a handle on the dates?

Tom Santilena: It was 1978. I remember that pretty distinctly and it was the tail end.

Jennifer Stock: Can I ask what was presented at that meeting? Was it an official expedition? This is what we want, Bob wanted to explore Cordell Bank? Exactly what was presented?

Tom Santilena: That was presented, Bob giving a speech as he frequently does and he tells his intentions and tells what he wants and what he thinks he needs to put some of this together. And there were all these little ideas that people had, most of which were not ever used but it was all important to find out who the people were, who's going to really be interested. Are you just a sport diver curious or are you somebody with a little bit of experience?

So it was a feeling out process for Bob. I don't think Bob knew at that point in time he'd be able to get anybody to go on something like this. It was put out there to really fish around for people.

Jennifer Stock: About how many people were there?

Tom Santilena: I seem to remember maybe 20, about 20 people.

Bill Kruse: I seem to remember more but it seemed like a lot of people for something that was still so preliminary. But there was a lot of interest. I believe it was in the *San Francisco Chronicle* or *Examiner* was a news story and that's how it was announced, so there was a lot of exposure to at least the fact that there was a meeting and diving was a real popular sport at that point in time. A lot of people were taking classes and getting involved in looking for something beyond going to Monterey on the weekend. I think it was in everybody's mind who came that night.

Dewey Livingston: So what was your impression of Cordell Bank before that meeting? Did you know anything about it?

Tom Santilena: I did not know anything about it. I had no impression. It was just an opportunity to start a new project and discover along the way.

Bill Kruse: I had never heard of it and I looked at a map and it was the old chart and it looked really far out and deep and difficult and it was a little intimidating, frankly. Actually, it was a lot intimidating.

Dewey Livingston: Did you take part in the planning of the first dives?

Tom Santilena: I think everybody, to a degree, took part in the planning. I don't think anybody knew how it was going to come out and everybody had certainly their opinions on how it should be done, but I think in the end, it just came about by itself. And if you're talking about on the boat directly, that's when it all came together because Bill and I knew we were going to be the first ones. It was my Zodiac so we knew from that standpoint what was going to have to be done. It evolved like a normal dive. For us, it was pretty normal equipment and it's just that we were probably a little bit more competent than the other people to actually do it. So we really just got there and once we were there, we did it.

Dewey Livingston: So you're saying there wasn't a lot of preparation meetings, do this, do that?

Tom Santilena: I'm sure there was a lot of preparation and meetings but when it comes down to it happening, it happens completely different than what you planned.

Bill Kruse: We did have meetings although I don't remember them in detail. I'm sure Bob has them documented in a box somewhere. But we did do practice dives in Monterey with the gear, making sure we could doff it and don it and get in through the surf. And also, I think we actually took the boat out, as well, and fell off the boat and climbed back into the boat, tried to simulate as much as we could in Monterey the types of conditions.

But I don't remember feeling as confident in our capabilities as Tom seems to remember when we went out there. It seems to me in my memory that we made several trips out there before we actually were able

to dive that season and we didn't know the weather window. We didn't know currents. So it seemed like it was getting iffier and iffier as each trip occurred and we were starting to wonder if we really knew what we were doing and knew if we could do it. So I wasn't as confident as Tom seems to think he was.

00:20:00

Tom Santilena:

Well, I actually skipped the beginning part. There was a lot of preparation in terms of practice dives and this sort of thing to make sure that what really were the capabilities of the people who were there? Were they capable of doing the things that they advertised themselves for? How good of a diver are you? 'Cause Bill and I can look at people and pretty much size them up on what their capabilities are.

Yes, there was a lot of preparation. Whenever we'd go out, Bill's right, we didn't get out there and jump in the water and go to the bottom. There were many things, many times, and attempts to get out there. But I think the thing that was most intimidating was the weather. You never knew how the weather was gonna be and coming out from Drake's Bay around the point, the conditions of the sea are always a bit lumpy there until you get beyond.

So you never knew what you were getting into until you got there and then the problem was can we find this place? That was what took the most problems and that's what ruined a lot of it – ruined or made a lot of the dives unsuccessful or trips unsuccessful, because we couldn't find it.

Bill Kruse:

So I have to correct you. In the early days, we came out of Bodega Bay exclusively.

Tom Santilena:

Okay, yes, that's right.

Bill Kruse:

'Cause that's where we could rent a boat and a skipper who would take divers out, which was pretty unusual.

Dewey Livingston:

Now, Bob definitely had his goals for this expedition and what turned into an official expedition. Did you have any particular goals or something you wanted to get out of it?

Tom Santilena:

I just wanted to have fun and go into a project. That's my only preconceived desire and goal was just go out and get it done.

Bill Kruse: So you didn't have to do yard work.

Tom Santilena: It's better than yard work. It's harder than yard work but much more interesting.

Bill Kruse: I was interested in the photographic opportunities 'cause I'm still an amateur photographer but I love to do it. So I was interested in taking what we learned in the cave diving and applying it to the offshore diving. I'd done photography all over the world and in Monterey a lot. I'd traveled before this and so Cordell Bank was a place that nobody had been before so it seemed like an opportunity to get the first pictures of someplace where nobody had been.

You think back to the moon landing and you think, well, nobody's been there. Well, nobody had ever been to Cordell Bank before, at least that we knew at the time, and so that was the spirit of adventure for me other than just the mechanics of doing it all, which of course I get into. And we'll probably get into this later, but it evolved into actually mapping the place. That, to me, became, other than photography, the most important thing for me.

Dewey Livingston: You mentioned the chart and all you had to go on then was that one chart. How was it approached to find this place if all you had was a chart that didn't give you a lot of confidence?

Tom Santilena: Well, we were depending totally on LORAN and just our general direction. I guess Bob had been there before so he knew generally where it was but in those days, it was by the seat of our pants that we would get out there. I think first was LORAN-A and then it got to the more sophisticated, what was it, LORAN-C?

Bill Kruse: We actually depended upon the skipper of the boat that we rented initially and whatever navigation equipment that he had, be it a compass, be it a finger in the wind, or be it a LORAN-A or C. None of these things seemed particularly reliable and the shallow point on the chart was a dot 20 miles out to sea that was just a little hard to imagine finding. It actually amazes me that it was found and it was because of the skipper and his sea sense that actually brought it together.

But finding it again over time, we continued to evolve our methods, of course, until I think just about on the last trip in 1986, we actually had one of the first GPS systems but only for two hours a day because there's weren't enough satellites up there and it required a huge 19-inch rack of equipment and also, an engineer from Motorola to operate the thing. So as time went on, the navigation improved, but by the time we essentially ended our intense efforts on the project, we still didn't have what we have today, which can put us right on the spot within meters.

00:25:00

Jennifer Stock: Do you remember the date of the NOAA chart you were working – was it a NOAA chart you were working with?

Bill Kruse: Um-hum.

Jennifer Stock: Do you remember the date of that chart?

Bill Kruse: No.

Jennifer Stock: It was an early chart, though?

Bill Kruse: It had to be like 1975 or something like that. I probably still have it but I don't remember.

Dewey Livingston: Now you've spoken of your experience in diving in risky places and that you'd never been to Cordell Bank. What were your safety concerns?

Tom Santilena: I think the biggest safety concern was once we got out there, it was the tanks and things moving around, just basically being able to keep up with all this equipment. As you came out, you just saw this array of tanks, regulators, weight belts. There was just all of these things and all of these people who you never really dove with very much before so you really didn't know. To me, that was a little bit intimidating 'cause you pull all that stuff together 'cause it all has to get together in this neat little package before it works.

Bill Kruse: My concern was slightly different. It was farther out to sea than I'd ever been before to go diving. You could barely see land on a clear day and if we had a decompression problem, we really didn't have a way to deal with it, immediately, anyway. One could call the Coast Guard and that would take a long time. One could go to shore and that would take a couple of

hours. So you had a minimum of four to six hours to get appropriate help, and we looked into renting chambers and the technology just wasn't there for a small boat, nor did we have the resources to do it.

So decompression sickness, just being out there and getting lost, not being found when you surfaced, and that led to many discussions about the descent line and buoys and ways to keep track of things. And this was before you had whistles and horns and SCUBA tubas and stuff like that to catch people's attention. But even so, on a foggy day, even with all of those things, you might be in the boat – which first we started anchoring and then we evolved to a live boat situation – you couldn't see the buoy 'cause the fog was so thick.

And so getting lost at sea or getting injured and not to be able to get help, and the depths, all the things that could go wrong and you didn't really have a back up plan that was reasonable. Those are the things that concerned me, and quite frankly, 3:00 in the morning, they still concern me thinking about them. But when we got out there we managed to overcome them but I think we were smart but I think we were lucky, too.

Tom Santilena: Yeah, I think for me, it's because I wasn't smart that I wasn't worried about these things. We knew the Navy dive tables. We devised these little pole T apparatuses with tanks that were strapped to them. So if you could get to them, you could decompress. We knew we weren't going to be down at the bottom that long. Not being smart, I had faith, so to me, it was a leap of faith and I really wasn't nervous about that. The more that was nervous was going down, down, down into that deep, deep, deep water, yeah, not knowing when you're gonna get there, if you're gonna get there, and what you're gonna find once you do get there. I guess we'll get down to the first dive when we get to it further along.

Dewey Livingston: Who was there on the first successful dive? Can you pull that out of your hat and tell a little about them?

Tom Santilena: I remember Paul was there. I remember my brother, John, was there.

Dewey Livingston: Paul Hara?

Tom Santilena: Paul Hara. He was there, wasn't he?

Bill Kruse: I can't remember.

Tom Santilena: Paul was only there for a short period of time because he suffered from seasickness and he just didn't want to do it anymore. And my brother was the same way. He suffered from seasickness and I don't think that's the reason why he stayed away. I think that's just the way it happened. As far as the other people, I'm sure Harry Sherman was there. I'm sure Bob was there.

Bill Kruse: Don Dvorak.

Tom Santilena: Don Dvorak was there. That's a long time ago. I think there were probably some other people because there were always a lot of people there but I can't remember who all they were.

Dewey Livingston: Did people in that first expedition – I'm assuming that the first one was a trial to figure out how we're gonna pull this off – did people have specific tasks that they were assigned for that dive or was it pretty much everybody was equal?

00:30:11

Tom Santilena: Well, for me, it was getting the boat ready. It was my boat and we had to be able to get it blown up over the side and get the motor on there, so mine was pretty focused in that one area.

Bill Kruse: Of course, we all brought our tanks and equipment and stuff and ... on the first dive, we did each have tasks. Tom and his brother, John, and I on the first dive that we did which was the second year. There had been a previous dive. But this was the first dive where we had a larger group of people involved. I believe I had a camera but I can't remember now.

Tom Santilena: I assumed you had a camera. You never went anywhere –

Bill Kruse: And the goal was for all three of us to get the anchor position for subsequent teams and Tom was to collect sediment and shoot macros and John also had a goody bag to collect samples. So we had specific tasks and they were very limited.

Tom Santilena: But they were planned ahead of time that this was what we were going to do.

- Dewey Livingston:* On the day before the dive and the night before, how did you feel approaching this unknown? Did you sleep well, for instance? What was going on inside you as you approached that day?
- Tom Santilena:* The night before, not much. The day of the dive, the same thing I have every time I go into the water and that's butterflies. I always have butterflies until I hit the water. Once you hit the water, no time for butterflies. I was always nervous on every dive I've ever taken outside of sport diving.
- Bill Kruse:* I don't actually remember, but I can imagine, based upon how I feel about everything I do today, that I was thinking about it all night long and probably didn't sleep too well. And I believe we left shore early so we had to get up early and I'm a late sleeper. I was concerned but we had done so many things before, it wasn't a fear. It was more like, "Oh, geez. It really sounds like a lot of work and we don't quite know how it's going to work out but we want to live to be old and cantankerous, so we've got to do it right." So I know that there was some trepidation but I actually don't remember.
- Dewey Livingston:* Now we've been talking here about the days, months before your first dive on Cordell Bank. Is there anything else that comes to mind before we move on to that first dive, a subject or a story that might come up?
- Tom Santilena:* What sticks with me and I'll never forget it is all the equipment getting loaded on the boat. It was just lines of people passing each other. You'd pick up something heavy, come to the boat – and usually it was dark when we started out because we had to get there with reasonable time left over in the day. And I always remembered that the boat, the tanks, the people side by side passing shoulders to get everything on the boat. I always remember that.
- Bill Kruse:* My biggest concern, and I really wasn't involved with it much, Bob took care of most of it, was are we going to even *have* a boat and is it going to be a boat we can actually live with and is the skipper going to be somebody who's willing to work with us? That actually concerned me 'cause it seemed like the most critical thing. Beyond all the things we had control over, we didn't have control over the boat, and for many years, we didn't have much control over the boat until Bob finally bought a boat, but that was at least three years later. So that was the big unknown because

the skipper might not show up or he might change his mind after you put all the effort into it.

That concerned me, beyond just the diving and the planning and stuff. And why did it concern me when I wasn't responsible for it? I wanted the boat to be there and I had no control over it, so I was worried about it.

Dewey Livingston: Well, your first job on Cordell Bay for the two of you. You just said that you didn't dive the first of Bob's dives, how so do you mean was this a week or two later or was this the next year?

00:35:03

Bill Kruse: The first dive was in 1978, I believe, and I don't remember the month, and the meeting at Cal Academy took place after that, so they were able to present that we have dove on Cordell Bank and it is there and we've got this anchor. They'd been working on it for two years and they gotten one dive in I believe 1978, probably the fall. I'm not sure. The meeting at Cal Academy I think was late October or early November, if I remember right.

We had a year before the next weather cycle and I'm not quite sure whether we knew the weather cycle or what – when we did the dive. We'd have to look back. So this was a year later in my recollection between when the first dive was and when we had a larger, more organized group to do it.

Dewey Livingston: So this would be October, roughly, of '79, just to get this clear in my head.

Bill Kruse: I would assume so.

Tom Santilena: Our dive?

Bill Kruse: Yeah.

Tom Santilena: Yeah, it would have had to have been about that time. The weather window was from September –

Bill Kruse: And I was in Alaska all summer so it couldn't have happened in the summer; chasing sea otters.

Tom Santilena: It's within a three-month window. There's no doubt because we wouldn't even dive until September.

Jennifer Stock: We can double check Bob Schmieder's record, too, 'cause he mentioned the first day. He got down to the day.

Bill Kruse: Yeah, well, he's a detail person.

Dewey Livingston: Now, okay, your first dive. How about if each of you just tell a story of your first dive, everything, as much detail as you want to go into from looking down to the water to descent, what your tasks were, what it was like?

Tom Santilena: Well, of course, the task, as always, is to bring up samples. Pictures are wonderful, too. I brought a little Nikon with a macro camera with me and for us, it was our very first dive. I remember, we went down the anchor that time. We thought we set the anchor and it'd go over the side and I remember it was just crystal blue. It was so blue I couldn't believe it could be that blue 'cause we're so used to low visibility areas. We'd go down this anchor line in the blue and it just went off into nothing. You could see nothing. It just disappeared.

And as we went down the line there, it would start getting darker and darker and darker and the further down you go, the bubble – the sounds of the bubbles change. And at first they go [*bubble noises*] like they do [*bubble noises*], and as you go further down, they start getting higher in pitch [*bubble noises*]. And then we get into the dark area. Now you don't know where the bottom is. You look up, you can't really see the top and you're in it now. And I remember thinking, "Where's the bottom? Where's the top?"

And then we just kept going down and going down and eventually, you'd come to where you could see the bottom, maybe it was 60 to 80 feet below you but the reflection of whatever light was left would shine off the sand at the bottom and things would get more illuminated.

So we started going further down and all of a sudden, we noticed the anchor was floating freely and it was not anchored at all and it was just going further down into the blue. If we didn't do something now, it was never, ever going to get done, so it was at that time, I just decided let's go for it. I went as fast as I could to get to the bottom and it was – the narcosis was just really, really screaming at that point in time and

basically, I just went down and it was 205. I remember getting down to the bottom. I don't know why I had the wherewithal to look at my depth gauge but I looked at my depth gauge and it was 205 feet.

So I knew that this was much further down than we needed or wanted to go, so I went down as fast as I can, shoveled sediment or samples, as we would call them, in to my bag, reached over, snapped a picture, snapped a picture, and then got out of there as fast as I possibly can. 'Cause now we're in free water. There is no anchor line. We're just coming up free and we had to deal with that thought process going up. There are no little T bars with SCUBA tanks on them for decompressions. You had to somehow in the rough seas take care of yourself, so you were totally, totally on your own. Knowing this from the time you were going to leave the bottom, knowing there was no rope, that's when things in your head really start to go and when you're narced out, things are always intensified.

00:40:14

More questions have been asked of me on what is this nitrogen narcosis? How does it feel and what does it mean? And all I can say about narcosis is it's predictable because everybody gets it. Everybody gets narced. Maybe at different times and different days it's worse than the other but it's always there and everybody knows it's going to be there.

So how do you prepare for something like that? In my book, you have to prepare. You have to know exactly what you're going to do so you don't have to make any decisions and just do it. Now for me, it's extremely simple. Get in the water. Go down. Take a picture. Scoop. Come up. Just as simple as you can possibly get.

Now the real heroes are the guys, the photographers, because the photographers, of course, who make the hall here beautiful for people to come in with all the pictures, they have the same thing that I had but now how do they plan for their dive. All of these unknowns going on and they've got to position the strobes, shutter speeds, aperture, all these decisions that you have to make on the fly at the same time you're all narced out. So these are the people who have it harder than anybody and they're the people who make the sanctuary alive. So to me, the photographers are the heroes.

Bill Kruse:

Thank you, Tom.

Tom Santilena: You're welcome.

Bill Kruse: That's very nice of you. I guess I'll have to pay you. No. I remember it similar to Tom but different, as well. We had attempted to get the anchor hooked and as has been discussed since then many times, hooking the anchor in exactly the right spot is challenging, even when you roughly know what you're doing. And we tried to get the anchor hooked but perhaps it wasn't a big enough anchor or perhaps it didn't get in the crevice it was supposed to. Perhaps it was on the down current side of the ridge rather than the up current side of the ridge, so it wouldn't catch on anything.

But we had actually dropped the anchor more than once before this trying to get it and it had drifted. This time it had been dropped and, as far as we could tell with our expensive navigation equipment, it wasn't moving, but we didn't know. So we assumed the anchor was supposed to be at 150 or shallower when the dive plan was made.

And I agree with Tom that my first impression was that it was really clear and really blue and really beautiful and when you've been in the water a lot and seen really nasty conditions, this was just pretty wonderful. And I thought this is gonna be a really cool dive because we're gonna get to see all this stuff on the bottom that we've heard about. And as we went down and didn't see the bottom coming up, that started to concern me, but once you start getting to 100 feet is when the narcosis begins and it kind of sneaks up on you and we just kept going down 'cause we knew the bottom was at 150 feet 'cause that's where we put the anchor.

When we realized that we were looking at sandy bottom rather rocky bottom covered with lots of life and small fish that we assumed were there – we didn't know at the time – it was like this doesn't look like we expected it to. And I remember looking at my depth gauge and it said 180, which was deeper than the whole dive plan was supposed to be, except that as Tom mentioned, the anchor appeared to be freely bouncing along the bottom and not catching on anything and it was going from shallower water to deeper water. It obviously had been on a ridge or nearby. We didn't see it but it was sloping up in the up current direction, so it was getting deeper.

And much as Tom did, there was a decision point of we knew how much everybody was counting on this dive happening at all because we were about to give up. It was becoming a real problem for money, resources, and with zero to show for it. We had been to 180 or 190 feet before and we knew that we probably could function and that we had enough air, air being the problem. It was clear enough the bottom was right there. You could almost touch it but it was 20 feet lower.

00:45:00

So we made probably the right decision for the sanctuary but the wrong decision for ourselves and went down and decided to do it quickly and *real* quickly. And Tom described about one minute of activity on the bottom that he was involved in and John, next to him, was doing roughly the same thing but without the camera. He was collecting sediment, as well, as I remember.

And I believe I had a camera and was taking pictures of them though I don't know whether I actually took any pictures because what I found is this was the day that narcosis affected me more than I had had it affect me in the past. It started to affect my vision. It wasn't just thought processes. It started to affect my vision and as I've mentioned before and we've talked about before, I decided that I'd rather have those problems on the surface than at the bottom, 'cause like I said earlier, also, I wanted to become old and cantankerous and I'm making progress on both of those things.

So I actually decided – not really consciously but automatically – to start ascending and since we were away from the anchor and away from the line, it was straight up. The water was clear. We had a clear day. There was no fog. So getting to the surface was the priority.

But the tunnel vision continued to close down until I was able to get much higher, but meanwhile, I had left Tom and John. We weren't attached to each other any longer. We were no longer a dive team. We were dive individuals and didn't know what was going on with anybody else. The reality of the fact is I made it to the surface very quickly. Fortunately, we were down a short enough amount of time so that the risk of bends was minimal, although probably not insignificant, and managed to exhale so I didn't get an embolism, and as I'm told, came to the surface quite rapidly. It was important to me.

But still, I don't remember actually becoming aware of what was going on clearly until probably a few minutes after reaching the surface and then it kind of hit me, where's Tom and where's John? And that became my focus 'cause I was at the surface and I was not feeling – I didn't have any problems except that I had got there quickly out of control. At that point in time, here's two people I had spent many years with doing many things with and I thought, "My gosh. I survived this and they didn't."

It really bothered me for a few minutes until we figured out that everybody had gotten up. But we came up in different places and everybody on the surface did their job to come and pick us up and take care of us and find us. So the fact that we had talked about something like that happening in a general sense, everybody jumped into place and did it. I feel very fortunate that, number one, I made it to the surface, and number two, there was no side effects, and number three – notice number one is I was worried about me – then I was worried about these guys and I was *really* worried about them. Driving home that night, it was very sobering 'cause that's the closest I'd been to not having control of the situation at all anymore.

But still, I can say it clearly. We made the wrong decision based upon safety and planning. This was not the plan. It may have moved the project forward but it was wrong, so we probably should have found another way to do it. I'm just glad we're here to talk about it.

Dewey Livingston: Well, when would you have changed directions if you'd had your hindsight then?

Bill Kruse: When I hit 180 feet, looked and saw the bottom and saw it was 180 feet and knew this was well beyond – it was the first time I realized that we were beyond our dive plan. The anchor was loose. We were deeper than we should be. If we had followed our plan, we would have gone up and we didn't, so we should be admonished forever and anybody who does that, forever. It was the wrong decision.

Dewey Livingston: Did that ever come up again, not having the anchor in the right place, or was that the lesson learned?

Bill Kruse: We had drifting anchors again and we aborted dives – I can't point to a specific one but I remember aborting dives because the anchor was not

where we planned on it. So I think we learned from that rather dramatically and in most cases, Tom and I – not all, but in most cases – Tom and I were the first ones down and so we took that lesson to heart. If the anchor wasn't in a place where *we* could dive, then we would abort the whole thing and reset the anchor and somebody else would go in and check it later. Or if it was in a place that was not conducive for the rest of the day's plan, we would do our best within the timeframe we had. We would stop what we had planned and reposition the anchor.

00:50:18

And Tom has a story about doing that but we can't quite remember when that was where he actually moved the anchor up to a shallower position. We wasted all our air and our dive, but we got more teams in as a result of it.

Tom Santilena:

That's right. We didn't get the anchor down many times. The whole idea was to find the current, go above the hump, and then drift backwards. And of course, we probably failed with that more times than we succeeded, but once we did succeed, we would go down – Bill and I would go down to see if it was safe for anybody else and there were times we just – if it wasn't safe for us, it certainly wasn't gonna be safe for anybody else.

And of course, there was one time when the anchor was too deep but there was a pinnacle up there so I just grabbed the anchor, went up, blonk, went up a little more, blonk. I was sucking so much air but we were able to get the anchor high enough to where it would go.

Now we should probably clarify this. The first time we went down Cordell Bank, it was the boat anchor, this great big boat anchor. After that, we used buoyancy balls and stuff. It was the same technology that fisherman use. You get to where you want to be. You have these iron plates. You throw them over to the side where you think they'd be and then you use this ball as your descent line. And that's where we'd take the Zodiac over to the ball and dive out of the boat and that's how you descended. So like I say, we probably failed getting anchored more times than we didn't fail.

Bill Kruse:

And this year, this is tangential, they got it right every time. The skipper got it right every time on the Furmer.

Jennifer Stock: Do you think that's because of the maps that they have and the technology to locate?

Bill Kruse: It was because of the maps. The depth center used looked exactly the same, but there was also the GPS so you could actually determine accurately the direction of drift and current and so you could find out how you drift relative to the shallowest point or the point you wanted it and then reposition the vessel upstream, if you will, or up current or up wind, and when you knew that you were there based on the GPS, you could drop it. So GPS helps a lot because it's repeatable within a meter or two, so yeah. And skill. It helps to have a good skipper who knows his boat.

Jennifer Stock: It sounds like the first dive was really just so physically intense with the narcosis and leaving John and Tom on the bottom. Do you remember biologically what you saw there in terms of did you see the bank? It sounds like you were in a sandy patch maybe next to the rock, but can you describe biologically what you might remember or was that a cloud?

Tom Santilena: I remember it vividly. We weren't anywhere near anything that could be conceived as the Cordell Bank top with the living things. There were no living organisms. There might have been some kelp over there, short stuff right next to the bottom in a clump and rocks, little rocks. But this was a sandy bottom. Clearly, we missed it.

Bill Kruse: There were rocks coming through and coral and marine debris all over everything. It was like looking in a channel between the rocks that we've seen in pictures and stuff, but it was tending deeper at a very shallow angle and you could see rocks emerging up. Of course, you've probably seen this in the submersible dives, but this is the broader expanses that were planed off by the past sea level changes. So we saw no structure. We just saw a flat, slightly sloping area, which we've seen in several other places leading off away from the dive sites when we've had a clear day.

Dewey Livingston: Was yours the only dive that day because of the anchor situation?

Tom Santilena: Yes.

Bill Kruse: Yes. We were all significantly sobered by the whole adventure.

Tom Santilena: Except Bob. He was very, very happy because he got a picture and a bag of sediment.

Dewey Livingston: But Bob didn't go down on that one.

Tom Santilena: Nobody. Just us.

Dewey Livingston: So back on the boat then and returning, it was a narrow escape, so what was the feeling on the boat, in general? I know you have your own feeling about what was going on. Was it still sort of a victorious day or was everybody a little sobered by it?

00:55:07

Tom Santilena: For me, it wasn't as sobering as it might have been for the others. I was at the bottom. I did what I wanted to do, so I was happy. I saw Bill go up and I knew he was leaving 'cause I saw his flippers going in that direction and generally that means you're gone. For some reason, I wasn't the least bit nervous about Bill. Okay, he turned around. I didn't know he necessarily had a problem or anything like that. He went up and I said, "Well, time to go up." I wasn't the least bit concerned.

I was more concerned about my brother because I never saw him and I thought he was the one that was having trouble. I didn't think Bill was. 'Cause I couldn't see him. I could see Bill but I could not see my brother. My brother was gone and I remember really being worried about my brother, was he gonna make it. And I remember thinking that on the way up, is he gonna make it, and I was worried about him, not Bill. Didn't care – no *[laughs]*.

Dewey Livingston: So when did you first see John, then?

Tom Santilena: I don't remember. I think he was already on the boat.

Bill Kruse: I have this vague recollection that John saw the situation evolving and he may have collected some sediment but John is resourceful and I think he took care of himself. And really, there was not much any of us could do for each other at that point and so we had all dove together enough that I think he was probably comfortable that we were gonna do our bit and be done with it and all meet back on the surface, but we just didn't know that's what he was thinking at the time. I believe we were told when we got to the surface that he had gotten there already and they picked him up.

It may have been five minutes later or ten minutes later, because we came up in different places, so the Zodiac had to come around and get us, but it was a clear, calm day, so once you're on the surface, it's just like floating in Monterey.

Tom Santilena: Yeah. I had to stop to decompress. I clearly remember how am I gonna stay at the right depth? Because even though it was a clear day, you could see even from underwater that the ocean was rolling a little bit. There were no T bars. But I still stayed down to decompress. I don't know if I was at the right place, the right depth, but I did it anyway.

Bill Kruse: And that was the right thing to do and that's what I should have done if I'd had control over the situation.

Dewey Livingston: Now Tom, you went up freely, though? You didn't follow the anchor?

Tom Santilena: No. None of us followed – did you follow the anchor line? There was no anchor. It was gone.

Bill Kruse: No. We went off the anchor 'cause it continued to move into deeper water and we let it. We picked a spot and we all focused on it and the plan was to do this quickly and go up. I mean we did have some hand motions and so we had the general understanding that this was just gonna be a quick pop to just do something rather than spend time there 'cause we hadn't planned for that depth or the air consumption or anything. So we had a general understanding that it would be done quickly and we'd be gone and it just got more complicated. But we were off the anchor and free but clear and a nice, sunny day and relatively warm. It was a nice day at sea, actually.

Jennifer Stock: You're back at the boat. You've all reconvened. What were the thoughts next in terms of should we do this again? Would I do this again? What were the next thoughts in terms of where this would go?

Tom Santilena: Like I say, I'm not that smart so I never even went that far. We were told to get up there and – what do they call it? Debrief, and that was the next thing. I was certainly worried that he was okay. He was okay and that was the end of the thought process for me.

Bill Kruse: I remember Bob saying we've succeeded because Bob always defines as a success if there's any slightest chance of it being called a success. So I think Bob projected more confidence than perhaps some of the rest of us had at that point until we had reflected, but he leveraged a very small success and a challenging situation into something he could build upon.

So I think the general mood of the boat was, since they hadn't experienced all of the details that we had, that though we had failed to get an anchor where we could put more people in, that we had succeeded that day. So the mood was, I think, more upbeat than downbeat. It was more the private reflections of the details because those were very personal, but I think the boat was more upbeat because everybody was okay. We did it. We came up and we were fine.

01:00:10

Tom Santilena: We have pictures. We have sediment. And scientists, if they can find any way to deem it a success, they do. So we have something, we deem it a success.

Bill Kruse: So we didn't ignore the elephant in the room but it was not the major point of conversation. I think we all, as a group, moved on, and some of us still today think about it as a very significant day in our lives.

Tom Santilena: I've never forgotten it and it's a significant day. There's no doubt about it. I remember there was concern about Bill. People wanted to know that Bill was okay. He may not have known that at the time, but me talking to other people, "Is Bill okay? Is Bill okay?" 'Cause not everybody was privy to what's happening at that moment in time at that particular place. But other people would say, "Is Bill okay?" "Bill's fine."

Dewey Livingston: So going home, getting home that night or whatever, the next day, what did you tell people or was it just back to work? What did you say about that experience?

Tom Santilena: I would tell my wife but then nobody else of my immediate friends were divers. They wouldn't understand, anyways. For me, I enjoyed it. It was a great adventure. We were home safe. We got there. Like Bill says, it was a little bit more than we really needed to do. But it was over and I had no problems as far as calling anybody and telling anybody. I did not. Like I say, I'm simple. Simple people do it by brute force.

Bill Kruse: Tom is more complex than he lets on.

I went to work the next day or the day after that. I think it took a while to put it in perspective but we were planning another trip soon after, as I remember. Maybe not that year. I can't remember the timing. But we got back to planning it and learning from our mistakes and vowing not to do those things again and actually, we didn't.

Dewey Livingston: So you definitely wanted to go again.

Bill Kruse: It was a pretty cool place.

Tom Santilena: It was a real good adventure and that's what it was all about. It wasn't a sport dive for us. It was an adventure.

Jennifer Stock: That's funny. Bob called it, it was not an adventure. It was an expedition to collect – he really wanted to downplay the adventure part of it in his mind.

Bill Kruse: But that's Bob's point of view on it and actually, that's probably what made it more successful. We worked on Bower Cave for ten years and got a few species and did slide shows and hundreds of presentations around the state and colleges and stuff, but no major written material resulted from it because it was an adventure. We wanted to tell people the story but we had a different outlook on how to do it.

Bob came from it as a scientist from a research lab as a physicist and said – and this has probably been said before – he says, “if you don't write it down, it didn't happen.” Now perhaps we're writing a few things down today but these are old recollections, not fresh recollections. So in that sense, even reading through some of the materials last night to jog my memory, the fact that quite a number of articles got published, an awful lot of material got covered. Not everything, not the details behind the scenes, but enough to put it in historical perspective which now, of course, it seems much more important because there's a sanctuary that actually has use for that information, whereas before, it was fishermen. You go to Cordell Bank to go fishing. That was the only real purpose, as far as I knew, and now there's a much more significant purpose.

So Bob's view of it actually turned out to be much more valuable than probably most of us gave him credit for at the time. I hate to give Bob a pat on the back because I like to bug him so much, but it was that point of view that brings us here today and if Tom and I were doing it, we wouldn't have a sanctuary. So it's a difference in personalities. So it took a team of different personalities with different goals and different interests, where some of us had adventure. I had adventure, too, but I was interested in photography. We each had a goal but Bob kept it tied together, no matter how much gaff we give him for doing it.

Tom Santilena: He was the glue to the expedition. There's no doubt about that.

Bill Kruse: And I discovered in many other projects since then if there isn't one strong, outspoken, dedicated person, however annoying, around, the project usually doesn't happen. So that's the key to a successful project, somebody that never gives up.

01:05:14

Tom Santilena: Strike "annoying." [laughter]

Dewey Livingston: So, you made your first dive. You continued with Cordell Expeditions, which had been formed, I believe by that time, as an entity.

Tom Santilena: I believe so.

Dewey Livingston: What I'd like to ask you about is subsequent dives, not in any particular order but things that you would remember. But to start with, you, Tom and Bill, have been friends for a long time and dive partners for a long time before this, so could you tell me in the context of your so-called career diving Cordell Bank, how did your relationship, your dynamics work as a dive team? I get the sense that you two guys were a bit of a team in yourself. Is that a correct assumption?

Tom Santilena: It's absolutely correct. Bill, in all of our past projects and stuff, I've always looked to as the leader of the pack and I always looked at me as the carrier of the pack. [Laughter] And as time went on, because we stayed together through all of the projects all the time, it's almost like we're brothers. When we get into the water, I don't think of anything because we know what each other is going to do. I don't even think about it. It just happens. I can look at him and know exactly what he's thinking with

the most minimal hand signs that there could be. It's just when you're a team that long, you just gel.

Bill Kruse: I know Tom better than I know my brother, and trust him a lot more, too.

Dewey Livingston: And Bob used you, he acknowledge that and put you guys together?

Bill Kruse: Yes, he *used* us. [*Laughter*]

Dewey Livingston: Wrong term!

Tom Santilena: Wrong intonation, right?

Bill Kruse: Like Barack Obama last night. So you did a hell of a job. I'm sorry. That could be edited. [*Laughter*]

Tom Santilena: Well, I think that because of the known kind of let's call it resume that we have together, knowing that not just together but with the projects that you've gone on, our knowledge of equipment management, 'cause basically Cordell Bank was a function of equipment management and we've had so much equipment management experience. Looking at these things that needed to be done was for us rather easy. So to me, my feeling was that as far as divers, we were looked at as leader divers simply because it seemed like we knew what we were doing and I think we did.

Bill Kruse: The goal was to solve problems and it was not just for ourselves but for the group, 'cause it was a project and it was a team effort, but Tom and I bought the compressor that we finally ended up using. It was really hard to get tanks filled on land in Bodega Bay or Point Reyes, so we bought a compressor. I hope you don't want me to pay you back, yet.

Tom Santilena: I've been waiting.

Bill Kruse: So we bought a compressor. Bob and I bought a LORAN. When we really had to have something for the expedition, we figured out who had the resources at the time, 'cause we were all working but there's never enough money and never enough time. So we pooled our resources to do things. Tom and I are able to work together and not get on each other's nerves most of the time, most of the time, and that's valuable.

And the thing is, Tom is one of the people I know who is good at a lot of physical things. He plays – well, maybe he doesn't so much anymore – golf, tennis, all the physical coordination sports and some of those coordination skills you actually need to keep everything glued together in the field and so he's good at that. You don't have to worry about him stumbling over something and breaking it 'cause he's not watching out. He's very aware of what's going on. So in that sense, we've found that we work together well. We think together and in an emergency situation, it just seems to work.

01:10:00

We were trained for that in the diving education stuff, but also the activities help tune those skills, too. There was a diver along on Cordell Bank who to this day says that because I calmed him down there when he felt he was short on air, he's here today and happily married and off having a great life. But you don't plan on those things but sometimes they happen and other people need your help and we've needed other people's help at times.

So anyway, the bottom line is we work together well and I'm quite not sure why. There's just some chemistry, something that works, and our wives get along, too, and that's helpful.

Dewey Livingston: Bob called you, and I quote, "My strongest divers," and I hear from other people we've been talking to that it sounds like you two were often or maybe always the first to go down on the dive to set things up. Is that the case, and if so, can you tell me about that?

Tom Santilena: I only remember one time where we weren't and I don't remember why that was, but I think it was because of our experience. As I said before, we've been in difficult times, difficult caves. I mean the cave diving is really, really dangerous stuff, so after you think about cave diving, ocean diving is nothing. I don't know. To me, ocean diving is not very difficult. I was more nervous in a cave when there was nowhere to go up to.

So I think through osmosis it was pretty well understood that we had more diverse experience than anybody else and the fact that we made it down the first time and didn't die, maybe they wanted us to go down and make sure we did – no, scratch that. I really think it's because it was obvious to everybody that we had the most experience. It was to me.

Bill Kruse:

I look at it differently rather than there was anything politically going on. We did get the opportunity to do it the first time and perhaps the second time and then we just got it done. And the fact that it got done meant that it was reliable and that probably more than anything else, if it could be done, we could get the dives set up for the rest of the day and so it was reliable and that's probably more of it than anything else. Because we only aborted the day a couple of times and it usually was conditions, whether the weather was picking up or the anchor just couldn't get it or we really were at the wrong spot and didn't have time and the daylight to go find the right spot. So I think it was a bit of, we fell into it at the beginning, we sort of volunteered, and then it worked, and so Bob chose to keep it working.

And the other thing is, over the course of the whole expedition, we were there almost every trip, not 100 percent but almost all of them. And we had other groups of people, individuals and groups, the Sacto Team brought incredible skills and experience and energy and enthusiasm and a lot of fun, but they were there a couple of years into it and then had lives to deal with. So we sort of bridged between different groups of people came through, so there was some consistency and that was valuable for the trip because people didn't have to relearn it from scratch.

Of course, we evolved that so that everybody with an individual and strong skill really got a chance to do what they did best. The Sacto team did many more things than I ever imagined they could do or should do but they were fun. But still, I think it was just 'cause we were there through the whole thing and we didn't screw up too much.

Jennifer Stock:

Bob refers to those people as the core team that were kind of through the whole thing and there were those that came and went but people like yourselves he called the core team. Why don't we talk a little bit more about some of the subsequent dives the following years? You want to go into that?

Dewey Livingston:

Sure. Maybe this would be a way to lead into it. I was gonna ask if you could be specific about what you did when you went down to set up for the subsequent divers? I've heard about setting up transects, things like that. Would this involve actually driving stakes? What exactly did you do when you went down?

Tom Santilena:

What you did once you'd get there was truly an evolutionary process. The whole idea was to be scientific, precise. We talked about grids and recording exactly where we were. But the most important thing we thought about is what are people going to do once they get there? How are they gonna know where to go? How are we gonna know where we are down there?

01:15:15

So I think one of the first things we did, we created a transect line. I don't know if you were over at my house, but we had this long, long, long rope and we had this binary system made up with four colors and we would put a different color every three feet or meter, eventually we called them "Schmeiders" instead of meters, and so at any given point along that line, you could take a picture and know exactly where you were.

So we put this long thing together on my street where I lived and then we put it on a great big coil and we would go down and spread this thing out, primarily so that the people who came down subsequently knew where to go and knew how to get back. 'Cause you couldn't just hang around the anchor.

Bill Kruse:

And could work in different areas on some sort of reasonable plan so it didn't actually cover the same area as the previous dive did.

Tom Santilena:

But at least you had a way to reference yourself, 'cause once you get off the line, if you don't see it, you don't know where you are. These things at least gave you an opportunity to reference to get back to where you were and if you were doing something meaningful, to say, well, where was that in relationship to where you were. 'Cause we always knew where we were, so where are you going and how do you get back?

I mean this was a big old spool. We'd go down and I think you have a picture of that spool someplace where we had rope in front of everything and it was kind of a mess to have to carry this great big thick old rope. Eventually, we got pretty smart and we just got one of these yo-yo things to hold on to the end of it and it's a tape measure and worked out really well.

Bill Kruse:

So Tom did all the work, and I thank him for that, on those set up dives. Whatever we were gonna set up, Tom brought down and set it up. And so I have a different perspective than he does as far as the photography

because since I wanted to do the photography, I volunteered to do the photography, I got assigned to do the photography, and I got to actually take pictures. So Tom did the work and I took pictures of Tom doing the work.

How valuable was that? Well, it's probably scientifically ancillary. We documented what we were doing. Coincidentally, you can pick a lot of stuff out of the pictures if you're taking the time to do it to see what's on the bottom. But basically, I was having a good time playing amateur photographer as we did this and this evolved over time to the situation where, as Don Dvorak has mentioned a number of times, a roll of film – I wish we had digital photography in those days – but a roll of film is 36 exposures and the dive lasted approximately 20 to 30 minutes and you can shoot a roll of pictures in about 10 minutes. And so Don first, he set the bar – added a second camera to the camera bar, added the second strobe for better lighting.

So over time, Don and I continued to compete with both the amount of equipment and how many pictures we could shoot on a particular dive. And I stopped at two cameras because that's all I could afford and Don went on to three because he just wanted to outdo me. But in the end, we were able to get a set of – Tom described earlier that there were a lot of things to set and Don Dvorak says it best when he says, "You set each camera for the type of picture you're gonna shoot and you don't think about that down there 'cause you can't think about that down there."

You just remember that this is the close-up camera and this is the far away camera and you use them appropriately and that simplifies the process. So basically, you're moving around the camera rig and keeping yourself in position and trying to get as much of the bottom, as much of the environment, as much of the process that's going on, and it's interesting that even with the dives in 2010 here, they did much the same thing.

So I really had the simpler job, except when we were off on an exploration. Tom would go straight there and I'd have to go way out in order to get the right shot. So I was, like the dog that goes on the hike with you, always running around off into the distance and still keeping track of the line and where Tom was in order to get the shot that sets up the right thing. So I did a little more swimming than Tom but he did a little more work than me in the process.

01:20:03

So that was overall, through most of the dives, the way things were broken up. Tom set things up and I took pictures of them and tried to put that into some perspective that we could talk about afterwards, like we did on Reef Crest expedition this year. We were able to see everything that night. In the 1980s, it took two weeks to get it all back from the film processors. That's how our tasks evolved and I'm not sure I remember what the question was.

Dewey Livingston: What were you specifically doing down there? What did you see? Some examples of wonderful things you saw or interesting things or your impressions of being down there, since your first dive, you didn't really see too much and we have photos.

Tom Santilena: For me, it may have been more beautiful than Bill because Bill was taking pictures of me so I was right on the bottom and as we've seen from many pictures in the past, is absolutely gorgeous. Life is living on top of life and if there was room, life was living on that spot.

One of the real interesting things for me, also, was when he found this hole. It's clearly not supposed to be there. I said that before in other interviews, that this hole was definitely out of place. It definitely wasn't natural and it was fairly symmetrical. It was a round circle. And that was pretty unbelievable and when you look at the sides, the sides aren't quite as vegetated as everything else, as usually sides would be. So that even more confirmed to me that this was something that was man made. And of course, Bill was taking pictures of me so I was down there up close and personal with the beautiful life that was down there.

Jennifer Stock: In terms of the habitat and the life that you saw, were you surprised when you really got a glimpse of that? Was that a surprise, to see that density?

Tom Santilena: It absolutely is a surprise. You go down to Monastery and you go to 150 feet or so, you don't see much of anything, but to go down here, you're below 120 feet. Now subsequently, we found that we were not on the high spot, very few people ever got right to the high spot, to see the corals and the colors. Luckily, we had light to see the vibrant colors. As far as I was concerned, you would not see life like this at the bottom, no possible way. There's not enough light. When there's no light, things don't live.

But the only thing that I can attribute to all the life that we saw was that it was clear enough out there where some of that light, ambient light, got down to the bottom. The beauty and the life down there, I did not expect to see that at all.

Dewey Livingston: Did you know what a lot of that was?

Tom Santilena: Yeah, a lot of it I knew what it was. From teaching diving, you have to tell people what things are, so just through time, you know what it is. Could I tell you the family and genus and all that? Absolutely not. But a species of fish? I probably could tell you a species of fish. This is coral. That's a starfish. This is a sponge. California, these corals here, and so for me, I just totally did not expect this to be that way. There should be nothing there.

Bill Kruse: One of my impressions of Cordell Bank compared it to my diving experience in Monterey where I started in 1965 and watched as they put the sewage outfall in off of Carmel and saw the decline of the diversity of the ecology of the bottom over the years to what it at least was the last time I saw it, pretty bare in comparison. Monterey and perhaps Point Lobos, Point Lobos probably came as close to what we saw at Cordell Bank but it didn't measure up, probably because it was near shore, more sedimentation, and also the fresh water from Carmel.

But Cordell Bank had a higher density of life on it than anything I've seen except in the Red Sea, and of course that's completely different, completely different species and such. But the Red Sea was the only place where I'd seen comparable densities of stuff climbing all over everything. This was pretty special. It was like going on a trip to some foreign country and finding something that you'd never see along the coast of California and that was impressive.

01:25:08

The other thing that I noted is that we started, of course, on the 19-fathom pinnacle because it was the shallowest place and perhaps the most accessible, but as soon as you get to 150 feet, there's almost this demarcation where everything changes within about 10 feet as far as – and I assume being an engineer rather than a biologist has much to do with the light that gets down there. So that we found this lush coverage many of these places we dove, like Craine's Point and the Western Pinnacle, they were not as lush but they were deeper and that was consistent. But still,

everything looked really healthy and most of the time, we had good visibility at the bottom, even if we didn't have good visibility at the surface. That, of course, enhanced the impression of what we found.

Relative to the holes – we were looking at a picture here of the 19-fathom pinnacle of the first hole we found and that we found right at the beginning, pretty well the first time we dove there. We found that 'cause it's right at the top and it can't be missed and we thought, among other things, "My gosh, what would cause this?" And there was wild speculation at the time.

What we didn't realize is there's numerous other holes in the area of the ridges surrounding here and we found a year or two later a much larger one just across the channel on another ridge, on a deeper ridge, more than three or four times as large. By then, we were learning that the Navy probably had something to do with this but this was all very cloak and dagger type information at that point in time and we puzzled about it a lot. But it was also when you don't have your full capacity of thinking, and that was the case at 150, 180 feet when we were doing it, this kind of caught you by surprise.

So we were blown away. We didn't know it and Tom and I came across them first because we were laying the transect line and that's when we found them. It was totally unexpected. Beyond all the biodiversity, I think that blew us away as much, if not more, because it seemed impossible. We didn't know at the beginning what could have caused it so it was like this is impossible. How can it happen? And it's there and we see it and we have pictures of it.

That was part of the adventure. There was the spirit of adventure there because you're finding things beyond what you ever imagined, completely different, having nothing to do with Cordell Bank, the location.

Tom Santilena:

I remember being kind of disappointed because it was like somebody's been here first. It must have been like Scott and the South Pole when Amundsen already got there before him and he was devastated. I remember being a little disappointed. It was so difficult for us to get there and these guys got here pretty well and they dug holes there.

Jennifer Stock: The holes, as you saw them, they looked pretty clean, right? There wasn't a lot of marine life in them?

Tom Santilena: There was less marine life. The close in crustacean type stuff was in there, little sea anemones, but as you can see in the pictures, it's not gonna get as much light when you have a cylinder there. The sunlight's gonna come from one angle and there just wasn't – it was clean. I could stand down in those holes and not worry about an urchin or anything like that.

Bill Kruse: Well, we can see how clean it is here [*looking at picture*]. This is another picture in, I think, this same hole at the top. But it didn't look like it had been cleaned. It just looked like it hadn't grown as prolifically probably due to the angle to the light. That was my impression and I have nothing to base that on but my impression.

Jennifer Stock: Now on this 2010 dive trip that you were just a part of, did the NOAA divers see some of these holes and did they have marine life in them this time?

Bill Kruse: They came across the hole right at the top of the 19-fathom pinnacle and they did find an iron bar there that was left by the Sacto Team many years ago and asked if that was our contribution to the ecology of the Cordell Bank, and yes, it was. So it was still there. Nobody's been there to remove it since then, apparently even your submersible.

01:30:08

Dewey Livingston: So they didn't find a beer can down there. The Sacto Team talked about beer cans.

Bill Kruse: We actually had a rule and I'm not sure how religiously, if you will, or fanatically we enforced it, but there was very little drinking on these expeditions because we really actually were concerned that it could be more of a problem than one might think. In fact, several people were summarily removed from the vessel because of that. That was hard, since beer was an important part of our life. But NOAA ships have – at least they did have beer once in a while, too.

Jennifer Stock: Well, they don't anymore.

Bill Kruse: Every 20 cans in the soda machine.

So the 19-fathom pinnacle area and the adjacent ridge with the larger hole are one of the significant dive areas because we actually visited it so many times, and on clear days, you could see out in the distance of the ridges going each direction. They're parallel and you can see that on the depth sounder and now fortunately we can see it on the sonar from 2005 and to a lesser extent, from 1985. But we wanted to see where it went. We wanted to shoot pictures of the dive and we kind of wanted to visit as much as you could within a single dive without moving the anchor. We still wanted to have that shallow point.

So we talked Bob into letting Tom and I, on one weekend on one dive, take the grand tour, where we started at the 19-fathom pinnacle, we went across the abyss to the other ridge that had the larger hole and continued in a clockwise direction. Starting heading roughly east, went to the end of that ridge, crossed at about 180 feet, and came back up the long way to the 19-fathom pinnacle. And you could not see the whole thing at all times but it happened within a 20-minute swim so you could put it all together in your head.

That was probably, of two or three dives, among the most significant to me 'cause we could see the whole thing for the first time. I don't think anybody else got a chance to make that tour and I feel pretty fortunate. And having looked at the 2005 sonar data, we can see the exact route and we showed that last year, to some extent.

Jennifer Stock: Right, we saw the slides.

Bill Kruse: But that was significant.

Dewey Livingston: From the 19-fathom pinnacle, did you see to the next ridge, at lease?

Bill Kruse: On a clear day? Yeah. When we had good visibility, you could. When we did it the first time, you only saw kind of a shadow over there. You knew it was there but you couldn't see it clearly and then until we got more than halfway across, it didn't actually come out of the haze. But it's close enough that on a good day of visibility you can see it, yes.

Dewey Livingston: I would picture that you'd see not a shadow but you'd see a glow because of the marine life on it. Is that not the case?

Bill Kruse: It's a deeper ridge, so there's less of the – well, you don't see the color so much, anyway, but you see less. Yeah, you see the top of it because of the way the light – but it kind of sucks in the light 'cause it's dark, it's the dark granite. It looks like a whale swimming by, actually.

Tom Santilena: It's a silhouette.

Dewey Livingston: But a darkish silhouette rather than a colored one.

Tom Santilena: Absolutely dark. Remember, you're gonna lose your light for a few feet really from coming with the surface, so without lights behind you, everything looks kind of let me say grayish for the lack of a better word. But these pictures that you see in the sanctuary and everywhere, those are illuminated by artificial light. When you're down there, if you even had a flashlight, there might be a small beam. I would carry a light and there would be a small beam. But for all intensive purposes, it's not that beautiful when you don't have artificial life.

Bill Kruse: Light. Artificial light.

Tom Santilena: What did I say?

Bill Kruse: Life.

Tom Santilena: Sorry.

Bill Kruse: At least that's what I heard.

Dewey Livingston: Were there any memorable marine life sightings during your many dives down there that come to mind?

Tom Santilena: I think the Metridium. They're very, very beautiful. They're an anemone that has a long, long neck and they're bright, bright white and because they're bright, bright white, they're easy to see and they're pretty nice.

01:35:00

I remember one time that was, aside from the Metridium, we were going across one of those channels and I remember looking down into the white bottom of sand and there were hundreds of fish. These were big fish, not little, tiny schooling fish. These were probably ten-pound fish. I think we called them red cods. But they were all spaced evenly away from one

another. It wasn't a school that was going this way. There was a perfect set of distance between each one, in front, side-to-side. It was like they were a marching band.

And that really, really impressed me. I didn't understand what would ever cause fish to do that but I've always remembered that 'cause it just never happened and they were dead stopped. They weren't going anywhere. It was like they were sitting on the bottom and somebody told them – and that was pretty unbelievable to me.

Dewey Livingston: Anything come to mind, Bill, about fish, sharks? Did you see sunfish, whales?

Tom Santilena: We saw sunfish. We always jumped in the water, there were sharks. There were always sharks when we jumped in the water. I never saw one once I was in the water. They were all blue sharks and they just kind of scattered. Once you were under the water, I never saw one. In all my dives, I never saw one. When other people said that they saw one, I never saw one.

Bill Kruse: Of all the shark stories we heard, I only saw one shark swim by and ignore us on the decom line one day, and I think several other people had a similar experience. We never saw a whale underwater. In fact, I've never seen so many whales as we saw a couple of weeks ago ever, anywhere, anytime in my life. We saw whales but very few out there and nothing underwater.

I think from a moving marine life perspective, the juvenile fish on the bottom. We hit a year which was much like this year, where they were all over the place and they were in the way. They were in the way of the camera and in the way of the divers. They were in the way of doing anything, at least in how you perceived it. So that was impressive. I had never seen that type of schooling of small juvenile fish except in the Red Sea, where at least at the time, it was pretty pristine. It's changed now and it's still there in Cordell Bank.

So I remember the Metridiums that Tom talks about because on several of the deeper, flatter dives, I think Craine's Point area was one of the areas where we found a large group of them. And the reason they were important other than they were easy to see is we encountered them many

times in Monterey off Cannery Row in the deeper water of 60 feet and deeper out there, so we were familiar with them.

I don't remember if we saw any sea pens because we were not in muddy areas and sea pens require muddy areas and Metridiums can be on the rocks.

Tom Santilena: I mean you're asking us for interesting things we saw and I think also what was an interesting thing was what we didn't see. There were many dives where we would go out there and no fish. They seemed like they were gone. And then other times, like Bill said, they were just all over the place. You can't get them off your camera. That's pretty interesting, too, 'cause you go down to a place that's so lush in life and all of a sudden, there's no fish.

Jennifer Stock: Are you talking about the juvenile ones, the smaller –

Tom Santilena: I'm talking about any. There are no fish. Occasionally, you see one but for all intents and purposes, there were no fish.

Jennifer Stock: I wanted to ask that actually, just to follow up with what you had said. So year-to-year, you saw some changes in fish population. Sometimes you'd have extreme abundance, sometimes none at all. Overall, did you see major changes from when you first dove at Cordell Bank to your very last dive in terms of just overall impressions of the benthic habitat or the fishes in general?

Tom Santilena: For me, from a non-scientific point of view, no. It's difficult to say because one day there would be no fish and the next day there would be many fish. So how can you judge whether there's been over a long period of time a swelling or a decline of any species because it's all what happened on that day and every day could be different. So from that standpoint, I couldn't say whether the coral raked. None that I could really say.

01:40:00

We know that there were fish nets down there. We would find them so you know if they were dragging nets, that they're gonna screw up the bottom in terms of the crustaceans and what not and you assume that they would take the fish with them. But could you say that they were depleted in any way because of man or because of ecology? I couldn't say that, no.

- Jennifer Stock:* Can I ask about the nets you saw? Were they troll nets or were they long lines?
- Tom Santilena:* I think they were troll nets. They were made out of ropes with the square. They were the kind with the squares. They weren't gill net type things. And those are the kind of things the fishermen lose all the time. I've been an avid fisherman for many, many years and those are the kind that you always pick up on your rods and fishing boats just generally go out there and get shrimp and they drag these nets on the bottom, but not long lines.
- Bill Kruse:* So I'll ask Tom, do you remember seeing those nets anywhere but the Western Pinnacle? 'Cause I don't.
- Tom Santilena:* I can't say that. I don't know. I never know where I am. I use Bill as my compass because I have a poor sense of direction but he has a great sense of direction.
- Bill Kruse:* Big mistake, big mistake. So I wanted to follow up on that question with Tom. I would give the same basic answer. We probably did more dives on the shallow 19-fathom area than any other single place but we didn't always go back there every year. So I don't remember any obvious changes except in the juvenile fish population. I didn't see the other.
- The other places we dove all had different environments, which was encountered this year, as well, the Western Pinnacle and Craine's Point and the Tor Hakluyt Ridge and the northern end of the plateau. All these have different depth profiles and so we would see something different and we didn't return and visit those as often. Sometimes we didn't revisit them at all, so we have no time history to look at that.
- Dewey Livingston:* Did you have any problems with currents up and down and how did those sort of change over time?
- Tom Santilena:* It's not even a change over time. It was more or less the same thing as with the fish. It was different each time. Sometimes we went down there, there was no current or hardly any current at all, and sometimes you'd get there and you'd be here and the next minute you'd be 10, 15 feet over here and then you'd come back over here. So sometimes it was a washing machine when you were down there.

I remember being with the Sacto Team on one and we were just laughing like crazy and then we'd be all tangled up in this line. We took out our transect lines and dragged it across and then all of a sudden when you have to come back, they just bow up and get caught in everybody's face. So currents were different on any given dive. Usually it was nice but there were some times where the currents were moving pretty good.

I remember one time where it was hard to get back to our starting point because it was like being on a riptide. You've got to swim against this thing. And it was like the current and the swell of the current was pushing you back further than you could go forward, so you really had to fight to get through it. So there were currents at times, yeah.

Bill Kruse: It seemed like the current had more to do with the time of year, when they were serious, anyway, and we figured that out fairly early and started avoiding other times of the year other than the September to November timeframe, late September to early November in the weather windows. In those windows, though, we had the surge from the swells going by, of course. I don't remember anything consistent because each trip could be different, but that window of weather also was the window of potentially the least amount of current.

The days that there was no current, it was like diving on the beach at Monterey except deeper. It was just so pleasant. Once you'd get in the water, it was just a pleasant experience. It wasn't work. It was pleasure, if it were only warmer. But we had current most of the time. Usually it was low enough it wasn't a big deal except for one or two times when we really had trouble. Each team had to fight it that day and we didn't get as much done.

Tom Santilena: The norm was though it was the nice, the vacation diving. There were times, but the majority of the time, it was nice.

Dewey Livingston: You mentioned water temperature when you wished it was warmer. Were you cold down there?

01:45:00

Bill Kruse: Yes. I used to be thinner than I am now and had less insulation and had learned that dry suits were helpful in that but when you get down at that depth – I never used a technical dry suit. I always used a neoprene dry

suit so I lost the insulation and even – yeah, I always came up cold because there was less insulation. We were always in the low 50s. I think one time we hit in the upper 40s and I understand it's warmer now in many cases.

But yeah, I just didn't have the best equipment available at the time and was cold, but not to the point of being debilitated. It was just uncomfortable. But you were so jazzed 'cause you didn't notice it till you got to the boat, really, or when you were decompressing. About 10, 20 minutes into the decompression. That's when it hits you.

One of the divers this year, Thor, a real thin guy, he had a little leak in his dry suit and he was commenting for the cameras and stuff when he got back and talking about the dive and he was just shivering 'cause he had gotten some water in the suit and he was just freezing.

Tom Santilena:

I was gonna mention before, Bill never used gloves, too, so he probably lost a little heat there 'cause he needed his dexterity in order to work with his cameras and what not. I never got really very cold. Like he said, when we were on the decompression line at the end of the day, of course it's gonna be colder then. But I only had a regular wet suit but our bottom times were to me so short that you really didn't have enough time to get that cold.

At the end of the dive, of course, you're gonna be a little more cold. When you're on the bottom, a little bit, because your suit compresses more and so there's a little bit more space. But again, the suit was giving you enough warm water and your bottom time was so short, I never found it much of a problem.

Dewey Livingston: Well, let's take a break.

[End of morning interview, end Audio file #1]

[Begin afternoon interview, begin Audio file #2, total 1:04:43]

Dewey Livingston: So we're back for the afternoon second section. We're talking to Bill Kruse and Tom Santilena on October 28, 2010. Where we left off, just to see if there were any more stories or anything to tell about the dives, for instance, Tom, did you have something to talk about with your father first?

Tom Santilena: Well, one of the interesting times for me was when we went out to tell about dedication to the project. Just as we were leaving, we got a radio call from the marine operator. My family managed to get a hold of us. They didn't really know how to do that. And my father had had a massive heart attack and that was before the dive, so I had to go out and do the project and do the dives with that on my mind and then when we came back in ready to bed down for the night, ended up having to bag my stuff all up in one of these black garbage bags and throw me over the side and swim to shore. And Paul Hara was with me for that. I don't remember why he had to leave.

So that just kind of shows you the kinds of things that can happen on an expedition. You just have to deal with things as they come up. In essence, once you start out to do something, you do it. Just like in the entertainment business, the show must go on.

Dewey Livingston: In the six or seven years it seems that you were diving, could you characterize the – I use the word evolution or the change over time in these dive expeditions from beginning to end?

Bill Kruse: When we began, we didn't quite know what we were up against but we were crazy optimistic and appeared, looking back, to have a way of figuring things out as we went. Finding out when the weather was right, when the currents were right, when we should turn around, when we should abort the dive. All of these things we sort of learned the hard way, in some cases, and also, the equipment we were using, we didn't know what we needed to begin with and slowly but surely evolved the techniques.

There was really nothing to reference to, at least in the sport diving field, in what we were doing. It was different than cave diving. It was different than most of the other wreck diving. We were out at sea. We were exposed. We had to deal with navigation, so we went through a series of navigation upgrades from the compass to the LORAN-A to the LORAN-C. We actually bought a LORAN-C and put it on whatever boat we were on so we could have a better navigation technology than the skipper did, in many cases.

Towards the end, we actually had a GPS, one of the first GPS that were available commercially and it was the size of a full 19-inch rack, 3-U high.

And the engineer from Motorola had to come out to operate it because he didn't trust us. Then we could actually visit places and revisit places as long as we did it within a two-hour window when the satellites were in position because they weren't all up there.

We found there was trouble getting tanks filled. Bodega Bay and Point Reyes don't have dive shops just sitting there ready to fill tanks, so we bought two different compressors, one that we had used before but didn't have the capacity to serve the expedition and finally, Tom and I chipped in and we bought a real compressor that we could put on the boat. So we were actually able to fill tanks during the day and coming and going and we had extra air available without bringing incredible amounts of extra tanks.

So it reduced the load, it increased the safety that we had, and by and large, even though we trained every year because we had new people, we had to get in shape, the routine started setting in so we could actually pretty well predict this is how long it's gonna take, this is what we have to do, and we could bring new people up to speed pretty quickly because we made those mistakes to some extent before.

So we got more efficient and the last significant trip that I remember, which was in '86, to a place we discovered with the NOAA sonar survey, it actually was quite a smooth dive. We had many people in the water. I believe we had three or four teams in the water at one time, which was pretty incredible for a 40-foot boat, and though it was a lot of work, it went relatively smoothly at that point. Of course we had good weather and that helps an awful lot.

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So it did evolve. It evolved to the point where for what we were doing, what we were willing to invest, and what we had to find out or what we thought we should find out, we sort of found it was time to move on to something else. We pretty much plateaued in what we could do. We'd solved the problems and we started the process to having the sanctuary nominated. That was well on its way at that time and there wasn't a whole lot more to do. And we were hoping that the establishment of the sanctuary would create new opportunities and more rigorous science in the long run and now we see even climate related science that could be built on that, but we didn't see all those things at the time.

But it seemed like we hit a logical break point to see what would happen next, 'cause since it was volunteer and we were paying our own way, we all had other things we wanted to do, too. So the expedition moved on to other areas, Point Sur, Farallones, and Alijos in Mexico, to explore different areas, to apply what we'd learned in different areas, and those turned out to be pretty satisfying trips all in all, too. But they didn't evolve in the same way. They were scientific but they were more short-term adventures, as well.

Tom Santilena:

Another thing that I thought of in terms of the evolutionary part of it away from the technical stuff of it is that we had a core group, we always talk about a core group. And there was a time at the beginning that we had no idea what we were doing so you had no choice but to evolve. Well, the core group was pretty much there through the whole expedition but there were people flowing through the expedition all the time and one of the worst things for a person to have to go through and I'm sure it's the same with everybody if you don't know what to do. If you go on a fishing trip or on to a boat and you just look, "What should I do?"

And as we went along, we knew what was gonna happen. We had evolved to the point where we could tell somebody, "Here, do this. Do that." So they weren't so closed and in the dark and feeling this trepidation of, "Why am I here?" So we could actually tell what was to be done because of what we had already gone through. We didn't know what was done and now when we knew what had to be done, we could pass that on to other people so they didn't feel so uncomfortable. They felt really part of the group.

Bill Kruse:

So this reminds me. The Sacto Team actually came much better prepared than any single group of people before that and integrated almost immediately, both in ability to do stuff safely and efficiently and also to work into the routine that we'd developed. They had done enough of this level of diving before. We worked together well. We had more than a good time.

Tom Santilena:

Yeah. They were really friendly. One of them, Jerry Seawell, I mean he and I almost became brothers out there. They were technically astute and at the same time, they were just a wonderful group of people. They were fun to be with, which is on an expedition is fantastic if you have people that you like and enjoy being around.

Dewey Livingston: Now you went on with Cordell Expeditions it sounds like. You stuck with Bob and his projects for a while longer. Is that right?

Bill Kruse: I think it's pretty much to the early '90's when we did two trips to Alijos Rocks off of Mexico. I think, Tom, you went on one.

Tom Santilena: I went on the very first one. In fact, I went out on a fishing boat out there and did the prep work, took pictures, this is what it looks like. Because nobody really knew what it looked like. But I've been out there many, many, many times on long-range fishing trips, so I was familiar with the place, very familiar with the place. So I was able to come back and give everybody a rundown, here's a picture of what it's gonna look like ten miles out, and took pictures right up to the end. I think he's got some of my pictures in his book.

So it was really, really fun. It was equally difficult and challenging, just like Cordell Bank. We got out there on the tail end of a hurricane so we were working in swells that were tremendously high and myself and Ron Skinner and Jeff Bazanek, we climbed to the top of the tallest pinnacle and actually managed to get Bob Schmieder up there, too.

Bill Kruse: What you see on the website is Cordell. That's where he _____.

Tom Santilena: We planted the flag on the top, put a bronze plaque on the little landing area, and that pole that we had the flag on was there five years later when we went back there. And everybody wondered, "What's that pole up there?" And I was able to say, "I put that there." Talk about celebrity. I was a celebrity. "You went up there?" "Yeah."

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Bill Kruse: So that and Point Sur and the Farallones. I got busy with an all-encompassing job at that point in time so I didn't get on on each year, but it went on into the early '90's.

Tom Santilena: Yeah, '91 was the last dive we did for Cordell Bank – that I did.

Bill Kruse: Okay. I don't remember. So Bob, of course as you know, still runs the boat for educational purposes, but we haven't done much since.

Dewey Livingston: Well now, so Bill, let's shift into your mapping experiences and I understand you had quite a project in support here as far as mapping Cordell Bank.

Bill Kruse: It actually turned out to be the beginning of my next career, which I'm in the middle of now, which is a remote sensing mapping computer career. And it came about based on some of the things we talked about earlier where we didn't really know what was there. The charts were vague at best. Depth sounder profiles were local and not particularly accurate in their location and position and we wanted something else but we hadn't figured out what to do. Of course, you can design things but you might be a decade doing that.

Apparently, there was a national need to know what the coastal areas were in what's called the exclusive economic zone and I had something to do with some world treaties that were happening at the time. But President Reagan signed that effort into being, I think in 1983, somewhere around there, and that led to NOAA actually officially doing a long-range large-scale mapping of the coastal zone out to 200 miles. So it started with the GLORIA side scan off the shore of the deeper waters and USGS handled that and I think that was in '83 or '84.

And then we heard that NOAA was going to use a SeaBeam or multi-beam sonar along the Pacific coast. And Bob had some connections with people at NOAA because he had already at that point in time suggested, "What do we do to see if this can become a sanctuary? I think it's important." Not everybody listened to him but at least he was able to get feedback and information on what was going on.

Somewhere in that process, Bob wrote a letter and got us the opportunity to go on board the ship that was gonna come and map Cordell Bank. They mapped Cordell Bank 'cause basically Bob asked them to. It wasn't on the official plan. And what was most spectacular about it is Bob and I actually got to go out on the ship and participate on the survey and I actually got to run the sonar equipment because they were one man short. Of course, it was the midnight to 4:00 a.m. shift. You get that shift when you're the low man on the totem pole. But it gave me insights into the problems, into the data quality, and when to look where there's bad data.

‘Cause I actually was on shift one time when we had equipment failure and we had to stop the ship and get it back up and wake some people up and do that. So being able to touch and feel and understand what was going on is different than just reading it in a book and intellectually. And we could watch the bank being mapped on the pen plotter as we were going and that was incredible. We were able to see things where we had been and we could see the depths. This wasn't a nice picture, this was a contour chart with depth soundings all over the place and we could see that as we went.

So this lasted for ten days and we had requested that we get a copy of the data. The trouble is, the data was in a format specific to the software that was on the computer on the ship and the post processing back on the East Coast, I guess Reston, Virginia, I think, is where the NOAA mapping office is. A little vague on that, right, Reston, Virginia.

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So Bob says, “Well, what are we gonna do?” And I said, “Well, why don't we ask for the software?” little did I know. And they said yes, after some cajoling. So we got copies of the source code of the mapping software that NOAA uses to translate this stuff from the ship to what they make the contour charts with or at least feed to the contour plotting system. And I looked at it and I said, “Oh, my gosh. They're throwing away 98, 99 percent of all the soundings and just picking the shallowest one because that's important for charting. You want to know where the shallowest point is for the chart.”

And then they're throwing away a few more in that area saying we have contours every 10 or 20 meters. We don't need all those points to draw those contours, so those are thrown away, too. So maybe 1, maybe 2 percent of the data was actually being used and the rest was being left on the cutting room floor, so to speak. But the data was all there on the source tapes and the program to process every single sounding was there. All you had to do was change a few lines of code to export it.

So it was more work than it may have sounded because the software was for a computer I didn't have, so it had to be imported to another computer system, another computer compiler, and then it took about a month to debug it and get it working so I could get the same results as we got on the ship. And we made sure we had sample results processed on the ship so we could compare them and get the exact same numbers.

The only problem was, and this was completely independent of what we were doing, is there was a conflict between NOAA and the Navy and Congress, apparently, about how this data could be used. The Navy wanted it classified, Congress wanted to map the exclusive economic zone, and NOAA wanted to have it and figured it should be shared with every agency and organization that needed to use it for minerals and strategic planning and stuff like that. But somehow, we got in early in the process, made the request, and were granted the request for the data before this officially was all written up and agreed to.

The trouble was when we went to leave the ship, they told us we can't take the data. I had the tapes in my hand in the box, but, "No, you can't take them. They are going to be classified." So I went home and for a month, we didn't know whether we could get the data after all this preparatory work. Somewhere in the system some rational person spoke up and said, "Everybody's gonna get the data eventually. This is a place that's in the process of being nominated for a national marine sanctuary. It's a small, postage stamp location. Yes, it's important. Yes, it might be sensitive but maybe we should just go ahead and let the data be used."

And I'm not sure they really expected us to use it in the way we were, even though the people within NOAA, I'd been communicating with the guy that was in charge of the software there. So we finally got the tapes and then, of course, it was, wow. I'm getting out of sequence here, but after we had processed the data, I got a phone call from a guy from Lockheed who said, "I'd like to come and speak with you."

And he did and Bob was there and we showed him – he said, "I'd like to hear what you're doing with Cordell Bank." And I suspect some of this was already triggered by the hole publicity back a couple of years earlier. They knew who we were and what we were doing and were kind of interested in how far we were gonna go with it. I think some people thought perhaps we had gone a little too far at that point, so there was tension in the government, in the defense industry, and we weren't sure where it was coming from but we were in the middle of it and didn't know quite what would happen.

So to make that section of the story shorter, we did get the data, we did get to keep it, and we did get to put it in the public domain, and at the time,

that was pretty special, apparently. And I just went back last night to read some of the articles in *Science News* about this and it talks about some of the details that I'd forgotten how special Cordell Bank was. Apparently, there was only two locations in the whole exclusive economic zone where they declassified the data so it could be used and I don't actually remember what the other one was.

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So one of the challenges at that point in time in the computer software is we didn't have graphics cards. We didn't have Photoshop. We didn't have GIS systems. We didn't have the software to handle the results of this point data, sounding data. So I'm eternally optimistic that things can be fixed and things can be done and so I made a reasonable attempt limited by my own capabilities at the time to write software to grid and render the imagery and that's what we ended up using for the 1986 trip out to Cordell Bank to find things.

Of course, we didn't have navigation that well and actually the survey itself wasn't GPS referenced like 2005 or the Reef Crest trip a couple of weeks ago. They had ranging transmitters, a mini ranger navigation system where there were antennas on shore that the ship would ping off of and measure the time delay and position the ship relative to these antennas sitting over USGS markers for reference on shore. So it was supposed to be accurate to within several meters and, embarrassingly so, we're still having trouble aligning the data from those days with the data from the GPS survey, but I think that must be something stupid I did rather than the original navigation.

So we actually were able to create from all of the soundings a digital elevation model or digital surface model of the bottom and do some shaded relief rendering of it, which at the time, was pretty unusual. It was a 20-megahertz, 16-bit computer that did all the work and each picture took 30 minutes to render. And so it was the sort of thing you could start things up in the morning and go to work at your job.

The other challenge, and this is a really excruciatingly technical issue, but the data format on the tapes that came from the ship was 800 bits per inch computer tape and that was already obsolete in the rest of the world, so I had to actually go to a surplus auction at the Lawrence Livermore Lab to buy a tape drive that I could interface with the computer just to be able to read the tapes on the computer.

So we jumped through a lot of hoops, which was challenging and interesting and frustrating at the time, but the end result is we had the only and the best map of Cordell Bank that had ever been made at the time. And for 20 years, that remained the only map of that quality. So it was a pretty technically interesting and personally satisfying effort and NOAA was actually kind enough to provide a small research grant to produce some of the imagery in the end, which to a large extent, up until recently, has been the imagery used for presentation purposes. So we pushed the envelope and we got more than we had hoped for in the end.

Tom Santilena:

Did you ever find out why they were so reluctant to give you the information? I mean what was so sensitive about some plots on a – ?

Bill Kruse:

It had to do with, I think, submarine warfare and people knowing where they were in submarines. This was before GPS, so you used inertial navigation for navigating the submarines and one way to correct for drift was monitoring contours on the bottom or bottom topography with the sonar and you could correlate this with the actual position if you knew what the bottom topography was accurately. So this was the most accurate bottom topography that as far as I know had ever been imaged. It was four-meter resolution, pings four-meter resolution sonar pings, and there were other multi-beam systems but they were all being used in deeper water, so they were lower resolution in the deeper water.

There may have been other places where this sonar had been used but this was the first time it had been used in this way. Of course now, with the right sized check you can go out and buy one of these and put it on your skiff, but in those days, it took a 220-foot vessel and a crew of, I think, 60 to put this out to sea.

The other thing that happened when we were out there is, as has been discussed perhaps in other places, the weather in April is really nasty in Cordell Bank. Generally, there's a north wind and a current and the weather was so rough that half of the crew on the 200-foot NOAA ship, *Davidson*, was seasick and this is the crew of the ship. Fortunately, I wasn't and got to eat well and sit with the captain and work with the equipment and work with the technicians who created the data.

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Tom Santilena: So does all this confirm the thought – we had always thought that perhaps these holes were used for listening devices. Does any of that for you confirm the fact that that’s really what it was or is it still just a rumor?

Bill Kruse: There’s no connection at all in the survey because even in the survey from 2005, we can’t see that high resolution to identify those things. So as far as anybody knew in those days, that was all hidden from the public and only because you and I went down there as part of this trip did it come to light publicly.

An interesting story that may not be connected directly with the sonar mapping but certainly with our being out there is one day when we were coming back to San Francisco after a dive at Cordell Bank, we were sitting on the fantail of the vessel, the sun was setting and it was a beautiful wake and the Marin coastline was off to the side. All of a sudden, this big, black, bulbous thing surfaced behind us. It was a nuclear submarine. It surface behind us. It followed us for a little bit and went back down again.

This is all speculation. At the time, I thought they’ve been monitoring us, but I’ve since read a book that suggests there was an awful lot of other submarine activity going on along the West Coast of the United States and also tapping telephone signals over near Russia. So this just may have been one of those ships passing through on the way to San Diego and, who knows. There was a lot of submarine activity connected with completely other stuff that’s come out in the public domain since then that was happening about that time. So perhaps it was just a coincidence, but still, I was impressed and a little humbled by the fact that the Navy could come up behind us, surface, take a look at us, and go down again.

Tom Santilena: Now before I had heard anecdotally, and I don’t know if it’s true or if I heard it wrong, it seems to me that at the beginning of the Cordell Bank expeditions that there was – I heard that maybe they went out there and actually took these hydrophones out. Did you ever hear whether that was true or not?

Bill Kruse: My information is only from Bob Schmieder and he says it’s true because he talked to a diver who actually locked out of a submarine to do that.

Tom Santilena: That sounds like proof.

Bill Kruse: Now I can't verify that. I have no other information.

Tom Santilena: Or it's classified and you just breached –

Bill Kruse: I have no idea. I don't have a security clearance.

Jennifer Stock: Who knew that Cordell Bank was so special?

Tom Santilena: Intriguing.

Jennifer Stock: There's quite a history around it.

Bill Kruse: Because of its location and because of its topography, we believe but can't confirm that it was possible to acoustically hide your submarine if you wanted to out there.

Jennifer Stock: Was the other place with unclassified data or data that they declassified, Davidson Seamount, by any chance, or do you know?

Bill Kruse: I don't know. The article in *Science News* doesn't mention it but there's probably other information we could find on the Internet. I found this article still is on the Internet. It's been put in an archive so one can still find it. So I imagine, I don't know. But of course since then, there have been numerous mapping. I know soon afterwards, I don't think the *Davidson* did the Davidson Seamount but another SeaBeam system did the Davidson Seamount not too many years afterwards, if not the same year as part of the EEZ. But the *Davidson* did go down and map what's now I think correctly referred to as Schmieder Bank off of Point Sur.

Bob and I went back to Washington, D.C. for an ROV conference and had the distinct privilege of visiting the NOAA mapping center, I think, at Reston. And we were told we could come into this room leaving our cameras and notepads outside and we could look at the plots of the data from the Point Sur Schmieder Bank, but we couldn't take anything but our memories of it away. So they had gone down and done that and now I imagine I know the Cordell Bank data is now in the public domain and available online. I suspect that might be, too. But of course MBARI went down and did higher resolution of that afterwards 'cause I talked to Gary Green about that at MBARI.

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So anyway, it began a whole sequence of things. It was useful, especially for Cordell Bank and helping getting the marine sanctuary established 'cause it provided some documentable reference point. But for me, it actually – there's a single picture and it's this one. This picture that –

Dewey Livingston: On Page 7 of Schmieder's book.

Bill Kruse: – got published in an article in *California Geology* that Bob wrote, I believe, and I think you have that. So somebody in the remote sensing industry is a geologist, saw that, and gave me a call and says, "Would you be interested in working in our software company?" I actually spent ten years at that company and this gentleman is now a close friend of mine and I still interact with him socially and professionally and it was sort of the beginning of the rest of my life.

Jennifer Stock: Wow.

Dewey Livingston: Now thinking of maps – it follows Page 3, so it would be Page 4 and 5 of Schmieder's book. It has the chart. I believe this would be the first chart that you would have been using –

Bill Kruse: I suspect so.

Dewey Livingston: – when you first went out there, probably the only map. This is the northern part of Gulf of the Farallones. And then on Page 7, you indicated this is the map that you were able to produce –

Bill Kruse: That's the first full bank image that we were ever able to get.

Dewey Livingston: Based on the data from the ship.

Bill Kruse: Right.

Dewey Livingston: And how about these ones on Page 23? Were those related to work you were doing?

Bill Kruse: Yes, those are – the previous full bank image is a reduced data set that would fit on the screen and what we did was pull out individual tiles of the data at the full resolution that we could grid and then used a rate trace rendering program that I wrote from some paper I read at the time to look

at perspective, 3D perspective, of the different dive sets that we were interested in. So we focused on those areas because we'd never seen them this way before and I believe the one at the top on Page 23 is the Western Pinnacle, if I remember right, and I'm not certain of the other one.

Dewey Livingston: And so you were able to render these from any particular perspective?

Bill Kruse: Yes. You had to type it in by hand, there was no mouse, to rotate the screen around until it looked right in real time. I had to figure out what angle to do to come up with the numbers of the angle and azimuth and distance and feed that to the program and run it and 30 minutes later, you'd have that picture. And then we'd shoot it off the screen because there were no screen captures in those days.

Dewey Livingston: Now were other people doing this or was this pretty ground breaking, the way you handled this?

Bill Kruse: People were doing image presentation, three dimensional raster image presentation like that. To the best of my knowledge, this was right at the forefront and I don't know whether something else was actually going on at the time but this was the first time it had been done with marine bathymetry and this high resolution. It had been done with lower resolution deep-water bathymetry from SeaBeam systems 'cause that was a commercial product that was widely used in the deep-sea research and probably Navy and certainly NOAA.

This was the only thing ever done with the shallow sonar swath from NOAA or this was the first time it was done with NOAA's shallow swaths on our system. It had been done before with the deep-water stuff but none of that software – there was no Internet then and you had to buy things from big companies. We had a low budget, so it was easier to write and tell your wife you were busy doing that and not cutting the lawn than it was to spend the money that we didn't have.

Jennifer Stock: Was this mapping data useful for leading you to the Western Pinnacle? How many dives were done after this mapping effort, 'cause it seems like this came pretty late in the overall expedition timeline?

00:35:08

Bill Kruse:

We wished we'd had this map at the beginning. Life would have been so much simpler because we would have been able to target the areas that we wanted to go to based upon knowledge rather than speculation.

So the last dives that I participated in were in 1986 and the goal was to visit the Western Pinnacle, which one evening after dinner, the computer was crunching through the data, it all of a sudden popped up on the screen. And I called Bob. I said, "Bob, there's a pinnacle that's diveable that's shallow enough that nobody knows about and we didn't know about." And he says, "How could that be?" I says, "Well, we actually never spent any time there. We didn't think there was anything there."

So at that point in time, we knew we had to mount another trip even though we were kind of running out of the energy and enthusiasm for doing it. And we actually went out there a year later and dove that site and it was one of the more spectacular sites we dove because it was – I'm looking around the room that we're in and the top of the pinnacle was about the size of the room, maybe a little bigger. So you had this I think it was about 130, 140 feet. It was in the area where you've still got a lot of life on the top and yet it would fall off and it was round and you could swim around it in any depth that you could stand.

So we put a team on the top with the anchor and to collect specimens and I believe Tom and I and another – John, I believe – swam around it. Now I took pictures of the whole dive and I haven't found them yet. They're on a roll of film that still hasn't been scanned. But there's a whole sequence of pictures swimming around that pinnacle for the first time and the water was clear enough that day that you could look up and see the top and you could look down and see the bottom and 200 plus feet going off towards the continental shelf and it was just magnificent.

And this pinnacle was isolated, kind of like a, what do you call, a sea stack off the coast in Oregon or California. But as you came around to the eastern side, you could see the canyon pop up and another plateau continue up and we actually were able to return to that spot the next day and dive there. And that's where the picture of Tom in the canyon silhouetted with all the fish was shot and some of the other group pictures where you have four or five divers and lots of lights. We were able to put up to five divers in the water at a time there because the conditions were ripe, the Sacto Team was there, and we were ready.

This was when we were at the top of our game, if you will, at that point in time. So we got I think eight divers, eight or nine divers, in the water that day, which is kind of amazing, and collected specimens, shot pictures, ran transects on that whole area. But the dive around the pinnacle was the tops because – this sounds perhaps selfish and stupid but *I* found it and I got to swim around it within a year with my best friend, Tom.

Jennifer Stock:

Well, now it's 2010 and you were just on this cruise on the research vessel, *Fulmar*, and they put NOAA divers down and they went to this dive spot. How was it to hear what their experiences were like in this place that you pretty much found and discovered and dove around yourself?

Bill Kruse:

Well, to back up just a little bit, the Fulmar expedition, the Reef Crest expedition this year, I was concerned that these professional NOAA high-tech, experienced, probably bored divers had seen it all and they were gonna come up and say, "Oh, it's just another dive site." We dove the day before on the 19-fathom pinnacle and they just couldn't stop talking when they surfaced after that and they were blown away and they were excited and that was extremely satisfying. First of all, it was still there and it was still good but real experienced people enjoyed it and were enthused.

So the next day, on the second dive, we got to the Western Pinnacle. The water conditions were not as good as we had hoped because they didn't have 100-foot visibility. They had 30, 40-foot visibility. But we were able to get them right down on top of the pinnacle and they were able to both shoot video and stills on there. And everybody came up who – the three guys, maybe two – two divers who actually dove there came up and did not discount all of the discussion we'd had about how nice it was. They said it was really, really incredible. The only thing that would have been better is a little more light down there and a little better visibility, but they saw the same pinnacle and they saw the same place, and yes, it's still there, too, and we were happy.

00:40:32

Jennifer Stock:

Did you see some of the pictures? Were there some pictures taken there or is that where the lights went out?

Bill Kruse:

I saw all the pictures and to the best of my knowledge, I've got copies of some of them, too. One's on my screen saver now. The technology for

the video and the still photography has improved significantly since we used film. The set up's the same. The general alignment of the lights is the same but the quality of the imagery is extraordinarily improved and it's instant, too. It's instant gratification. We can see the pictures as soon as the divers come to the surface and everybody can talk about it while it's still fresh in their mind and that was an experience we wish we had been able to have before.

So when I was out there on the vessel, we really visited three sites, Craine's Point, the Western Pinnacle, and the 19-fathom point, and every site was a new experience and was different for the team. But the fact that they came up enthused and impressed and these people who work in other marine sanctuaries, they know what cool is and they know what good is and they've rated this pretty high on the list, perhaps near the top. They were not expecting it. They were expecting much less.

Dewey Livingston: This makes me think of a question that will jump back a little because you mentioned the new technology of photography where you can look at it right away. When you took film pictures and waited to have them processed, would you then get together with Schmieder and others and scrutinize these pictures and do something with them in that way or did they more or less go in the file?

Bill Kruse: Both. We usually had, number one, a party to celebrate the expedition for the year and that was usually if not before Christmas, in the late winter when everybody had gotten everything back. And the requirement was if you shot pictures, you had to provide a full copy to the expedition. So the pictures that the sanctuary has and that Bob has are almost all duplicates of some sort in one form or another. So there's multiple sets between the photographers of Cordell Expeditions and I guess the sanctuary, too. So we have fortunately a little diversity if any one set gets lost and I understand some are going to Cal Academy.

So we got together and sort of looked at the best of the best in slide shows and we also provided a complete set for the archives and then over time, we did public slide shows at times but we sort of ran out of steam to do that 'cause that was a lot of work. We did a Cal Academy show I think one or two years into it and there were 12 projectors. It was a cool show, perhaps overdone dramatically, but we had a great time doing it and we

had all our best pictures in there and we had a full room and so it was a pretty great experience. But it got difficult to do that on a routine basis.

So pretty much the stuff got in the archives after we looked at it and got passed on – if there were specimens that got passed on to Cal Academy or U.C. Berkeley, usually pictures that went with that, copies would be made so they had photos of the area, as well. So it was informal but there was some structure to it and that structure, fortunately, has hung together enough that the set perhaps will eventually get scanned by Cal Academy, if Bob follows through.

Dewey Livingston: Now with the maps and with a similar question, the map you made that we saw in the book here, was that the map of record then for a great number of years? Was there any use for that map after nobody was diving anymore? Where did that go after the work you did?

00:45:00

Bill Kruse: I believe that we delivered all of the visual products that we had to NOAA as part of the contract that they provided us, so they had imagery – the imagery that we see in the book and stuff, they have copies of all that at NOAA and this was before the sanctuary was designated. So it got into the system somewhere. I'm not sure if it's still locked in a vault there or if it actually got back to a sanctuary here in California. I actually took it over to USGS and a group, the sea floor mapping group at USGS got a copy of the process data. They were interested in it, of course, for the geology. And I believe at lunch today, we talked about chipping granite off the rocks from the Farallones up to the north end of Cordell Bank, and I think that happened in '86 when we went out there, too.

So what we tried to do was find people who were interested in the information and part of it was my concern was because we had fought the classification issue that once it got back to NOAA, it would get once again locked away and very few people would have access to it. So we distributed it in as many ways as we could think of and we probably left a number of stones unturned in that process, but this was early in the process. This was before iPhones and laptops and stuff, so distributing digital data usually meant making a nine-track tape and not many people could handle that at the time.

So the sanctuary still looks back at it but they commissioned another survey in 2005 which was incredibly improved in quality, both because of

the field technology and the computer processing that was available then. But there are still things we can do with that that haven't been done yet, so that's the next reference set and that's the set that should be used going forward, and the 1985 data is a historical artifact, at this point in time rather than a reference point.

Dewey Livingston: Yeah, how times change in a lifetime. Is there any more to say about your efforts, mapping technology as far as supporting of the Cordell expeditions?

Bill Kruse: We did a small project at Alijos Rocks where we didn't have a multi-beam sonar but we did do single-beam sonar mapping at the top of the volcano and it got published in a monograph of all the research papers that took place on that. Generally, I guess the answer to the question is no, there was not much more done after that. It was sort of a once-in-a-lifetime opportunity and being civilians, we don't get to do much with NOAA except giving interviews once in a while.

Jennifer Stock: When did the expedition focus around this potential of designation of a national marine sanctuary? Was that early on or later and how did the rest of the team members relate to that or rally around that or not?

Bill Kruse: I don't know exactly when the idea was hatched but I imagine it was fairly early in the process and I can attribute all of it to Bob Schmieder. I can say for certainly myself, and Tom can chime in on his own perspective, I don't think any of us really believed it was even possible. It was so far out there that, it seemed appropriate but we're an amateur team in California doing this on the weekend in our spare time and though other sanctuaries have been established since by similar groups of people, there wasn't a precedent set at that point in time as far as I remember.

So I think most of us thought, "That's a great idea, Bob. We'll do what we can to help you." But it was pretty much if he hadn't persisted it wouldn't have happened. He wrote letters. He got in touch with the Congress, our representatives, and I think Barbara Boxer was even involved. Whoever was in government then, he was in touch with them, at least letter writing and personal communication.

So Bob championed it and also provided the professional interface, if you will. Bob is a physicist by training, has a Ph.D., and just those titles help

open doors and they helped him with a little bit of credibility, though to be perfectly frank, I heard through back channels he was more persistent than some people really appreciated. And so he built a reputation of being pushy and persistent and doesn't give up and I think it ticked a few people off in the process and that's probably normal.

00:50:20

Jennifer Stock: Within NOAA or within National Marine Sanctuary?

Bill Kruse: Yes. I see them as the same 'cause I don't know the people he communicated with. But still, if he hadn't have done that, we wouldn't be sitting here today and with all due respect to the idiosyncrasies of Bob, I respect him because he actually did it and something came of it. I have to give him a lot more credit now than perhaps some of us gave him at moments in time during the process.

So the process started early in the 1980s and Bob had a constant campaign both in publicity, getting stuff in the media, writing letters and following through and continuing to petition the process and that's what made it happen. And the fact that we did the sonar survey, too, that didn't hurt. That was a side issue but it helped to add credibility that maybe we could do just a little bit more than go diving. We could provide pictures. We could provide samples. We could find species. Little by little by little we built up some credibility and that was helpful.

Tom Santilena: Basically you just said what I was gonna say. In the midst of all this marine sanctuary and all the things that we had to do, he still did all this science, these wonderful species, and the identifications. The incredible amount of energy that Bob had, it still amazes me to this day on how he managed to do this so well as well as bounce these other balls over here. Because as you know, there are all sorts of wonderful species that identification to science involved and even deeper than the complexities of going in and trying to create a marine sanctuary, which in and of itself was probably somewhat impossible to do. But to do that and all these other intricate detail aspects of what he had to do, it's a testament to a pretty special guy.

Bill Kruse: Well, he kept in touch with a broad range of people and I think Jennifer pretty much knows the list of people, but Cal Academy and the Herbarium over at Berkeley are probably the two primary groups that were supportive and helpful along the way and kept Bob in check and at the same time

helped him out and provided references and connections when he was talking to somebody else.

Tom Santilena: And then to do this incredible project with the marine sanctuary and have enough energy to go to these other expeditions which were full-blown expeditions in and of themselves, just easier because we were now a proven entity in our ability to get things done. That kind of energy you don't find all the time.

Bill Kruse: Well, I don't have it anymore. I don't have enough.

Tom Santilena: That is for the record? [*Laughter*]

Jennifer Stock: Well, what were your personal thoughts when you learned that this actually was officially designated in 1989 knowing that you were a part of this from the very beginning and now there's this national recognition of it as a marine protected area?

Bill Kruse: I think we got a letter from Bob in the mail. I think we actually did get a letter from Bob in the mail, which was a copy of it.

Tom Santilena: Yeah, but for me, I was absolutely blown away that it went this far and to think that a marine sanctuary and people's jobs and all of this was we had something to do with it. It just blows me away and my name is in something that will endure forever.

Bill Kruse: To compensate for all of the other things that you _____.

Tom Santilena: That's not for the record.

Bill Kruse: That's not for the record. So I don't remember a particular feeling. I mean I remember, "Oh, geez. It's finally happened." But I think it was sort of an anticlimax at that point because there were so promises of it happening earlier. I think it was originally going to happen in '86 or '87 and through a combination of legislative priorities and other stuff, it got put off. I mean I don't remember all the details. I just remember it like a legal battle. It takes forever and you never know how it's going to turn out. So when it finally happened, it was almost a relief and at the same time, very pleasant.

Tom Santilena: When I was making my comments, it really wasn't until I came here and saw what had happened because of our efforts. That's what I mean. When it happened and mentioned before, a federal marine sanctuary, "Oh, that's great. That's wonderful that something that important happened." But when I came here, that's when I was really blown away.

00:55:15

Bill Kruse: So I have something to say about the sanctuary group that's here now and to a large extent, the key people, the core group of the sanctuary office is the core group pretty much from the beginning. You, Jennifer, are one of them and Dan [Howard] and Dale [Roberts] and a number of other people are more recent but still fully dedicated. It was always my dream to work for you folks and continue some of the projects that we do, but I fully understand the challenges of budgets and stuff and you pushed me off to do other things in a nice way.

But you've always been so gracious and nice to us. It's almost hard to understand why you would do that. It's satisfying and it's very appreciated and it could have been a lot more contentious relationship but it's turned out to be a much warmer and long term for similar and common reasons type relationship than it could have been and we ever imagined it could be. This is almost like a family between the office and the original team and I'm pretty pleased with that. It takes a little bit of effort to do that and I think you and Dan and Dale have gone a long ways out of your way, in many cases, to make that happen. Whether you did it on purpose just to drag us in here today or whether you did it because you're just nice people, it doesn't matter. It's very much appreciated.

Jennifer Stock: Well, that's nice to hear.

Bill Kruse: No, I'm being a little frivolous there. No, I sincerely want to thank you guys for continuing to keep in touch so we can share stuff and I think we will continue to feed each other stuff along the way in a positive way.

Tom Santilena: I hope so.

Jennifer Stock: Thank you very much. That's really nice. I can't imagine the sanctuary existing without really knowing these people. That's one of the reasons this project started was just to hear all this because it's the backbone of what the sanctuary is and what Cordell Bank is. Especially this last cruise.

It was a really nice marriage of what we're trying to do now and the history of –

Bill Kruse:

It's an update of the past and let me say something I think is evolving here. My perception of the sanctuary is it's moved beyond just resource preservation. It's moved to research and starting to connect heavily with the climate change research that's going on in so many other fields. I don't think that was the original plan. I think the original plan was just to protect it, study it, get insights to it. We're finding that Cordell Bank and the surrounding areas and the other marine sanctuaries are tied in to not just the sanctuaries but to the land and the atmosphere and the climate of the rest of the world.

And everybody in this area is looking at change in the environment that they're studying and the marine sanctuaries are part of that and I didn't actually realize that as clearly as I did last weekend when I saw the Marine Sanctuary Climate office at Crissy Field. There's an actual building dedicated to it with people in it, I guess, on the weekdays. I knew there was a research program going on but –

Jennifer Stock:

Yeah, that's fairly new.

Bill Kruse:

– it's more than a trivial commitment.

Jennifer Stock:

Well, based on your experiences and what you've seen in these last 30 years, what are your biggest concerns in terms of the future protection of Cordell Bank and the potential harm that could come that way?

Tom Santilena:

When you see all the problems that other people in other areas are having and the drilling of oil and all of these things, it's just fantastic that some area can be protected. And the fact that it can be protected from the fishermen, which are probably the biggest enemy of a place like Cordell Bank. If you put down your nets and drag it across it, it'll be gone longer than our lives, for sure. So that's probably, to me, one of the most important things is we put so much effort into finding the beauty, taking pictures of the beauty, sharing that beauty with other people. If I ever went there or heard that somebody had dragged a net across it and it was gone, I don't know what I would do. It would be devastating.

Bill Kruse: It's not because it's important. I just don't spend too much thinking about the challenges and the pressures on the area because I'm assuming that the sanctuary system will do its best to take care of that, so I'm not worried about that. What I'm interested in in the future of these offshore sanctuaries is a more engaging way for people to visit them other than just on a boat or in a book. Now I think technology can help with this. We've talked about this before, but I think the technology is continuing to make it easier.

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So I look forward to ways of the virtual tours at the level that remote sensing, whether it's sonar or side scan, photography, live video immersed, ways of bringing people to appreciate this. In the redwoods, we can go walk in them, if we would like to walk, anyway. In the ocean, we really don't have many options. There's very few ways to get there so they're really out of sight, out of mind. And I know, Jennifer, that's a continuing challenge for you but I see that as one of the challenges to raise the awareness in a way that people can get into, in the way that the short attention span people, teenagers and kids are these days, how do you make them appreciate it or how can you help them appreciate it?

That actually is where I'm concerned because what is the biggest problem? There's not enough funding. How do you get funding? You've got to have more people interested in getting funding. So that's what I think the problem is or that's what I think we should all work within the limits of our abilities to do in years to come. And I know there's an awful lot of practical details but that's the one I think about.

Jennifer Stock: That's good. That's great.

Dewey Livingston: I just have more of a personal question of you two, but hearing about your experiences at Cordell Bank, which I can only imagine –

Bill Kruse: I wish you were there. You should have come out on the boat.

Tom Santilena: Really.

Dewey Livingston: But where does that fit in the realm of your lifetimes as an adventure, as an experience? Where does Cordell Bank sit in your lives?

Tom Santilena: Well, Bill and I have had a lot of adventures over the time, over our lives, projects before and after Cordell Bank. But to actually be here knowing that we were a part of this, to me, this is one of the most important things we've ever done.

Bill Kruse: Yeah, I'd have to agree. As far as significance to a larger group of people beyond our friends and community that we revolve in, this probably has had the most impact. Certainly, as I mentioned earlier, it's impacted my profession and my career in a big way, which is a good thing, 'cause there's no longer retirement in this world. But I agree with Tom. We've had some impact beyond our local community and I think that's significant and we had a really good time doing it, besides all the work.

Tom Santilena: And it brings people, other people, to realize that there's an extension of what they see around. This is part of the world.

Bill Kruse: So it hasn't always been that wonderful, so to put it in perspective, this was a real slog for a number of years because balancing jobs and relationships and time off and stuff. It seemed important enough to do but at the time, we couldn't really fully justify it. We did it because we wanted to and so we're looking at it from 10,000 feet but remembering some of the little details that didn't go so smoothly and problems that we had. But I think all in all, they were worth it, so I mean that's what matters.

Tom Santilena: Absolutely.

Jennifer Stock: That first dive kept you there.

Tom Santilena: It was epic.

Jennifer Stock: Is there anything else that hasn't been touched on?

Bill Kruse: I think we should go find the next pinnacle that we haven't discovered yet.

Tom Santilena: There you go.

Jennifer Stock: All right. I like this sense of adventure.

Bill Kruse: New species, more deep-water corals.

Tom Santilena: A new set of legs.

Bill Kruse: Thank you, Dewey and Jennifer.

Jennifer Stock: Thank you very much.

Dewey Livingston: Yeah, well, really, thank you for spending your time and coming out here.

[End of interview and Audio file #2]

PIONEER DIVERS OF CORDELL BANK
V

Oral history interview with
Don & Elaine Dvorak and Sue Estey
March 9, 2012



Elaine Dvorak, Don Dvorak and Sue Estey

Edited Transcript

Interview by Dewey Livingston
with Jennifer Stock

Interview length: 3 hours, 11 minutes

National Oceanic and Atmospheric Administration
Cordell Bank National Marine Sanctuary
PO Box 159, Olema, CA 94950

Dewey Livingston: This is an oral history interview with three members of Cordell Expeditions who participated in the historic dives on Cordell Bank in the early 1980s. They are Sue Estey, Don and Elaine Dvorak. This is March 9, 2012, and this interview is taking place at the Estey residence in El Cerrito, California. As lead interviewer, I am Dewey Livingston, on contract with Cordell Bank National Marine Sanctuary.

Jennifer Stock: I am Jennifer Stock, Education and Outreach Coordinator for the Cordell Bank National Marine Sanctuary.

Dewey Livingston: It's good to start with one formality, which is if you would each state your name and make sure we get the spelling right. So state your name and the spelling of your last name at least.

Sue Estey: My name is Sue Estey. The last name is spelled E-S-T-E-Y.

Don Dvorak: My name is Donald Dvorak. Last name spelled D-V-O-R-A-K.

Elaine Dvorak: My name is Elaine Dvorak, also spelled D-V-O-R-A-K. During the expeditions, I was Elaine Senf, and that was S-E-N-F.

Dewey Livingston: Good – thank you. I'd like to start, if you would talk a bit about your personal background, if you wouldn't mind. For instance, your birthplace, hometowns and basic education – just a little nutshell about your background. Sue, could we start with you?

Sue Estey: I was born in Brooklyn, New York, same place as my father was born, except they took me to the hospital to be born. I was brought up near Troy and Albany, New York. I had a lot of water activities in the summertime because we went swimming and sailing. At one point, we even had one of those funny snorkels with a ping-pong ball in the top so it would supposedly keep the water out if you ducked underwater. But there wasn't a whole lot to see in the lakes of New York.

Dewey Livingston: And did you live there throughout your young life until adulthood?

Sue Estey: I went to college at Cornell in Ithaca and flunked out and spent a year in Boston and then came out to Berkeley and finished college out here.

Dewey Livingston: What were you studying?

Sue Estey: At Cornell, I was studying biochemistry. I was in the ag school, and that was one of the majors you could take. And I worked in two different

biochemistry labs: one in Boston and one in Cambridge during the year over there. I came out here and Cornell actually sent a letter to Berkeley and said, “She’d probably be a good student; just don’t let her study science.” So I found the humanities field major, and that let me take a whole bunch of courses that I wanted to take, not just calculus and analytical chemistry and all that stuff.

So, I came out here and within a year or so I was hooked on the ocean and the mountains, and it was amazing out here – so different from where I grew up in New York.

Dewey Livingston: You never left?

Sue Estey: I did leave for four years to Florida in the ‘90s, but that was sort of accidental.

Dewey Livingston: Don’t

Don Dvorak: I was born in Honolulu, Hawaii. My father was a career Navy man, and he traveled much around the world. He was never stationed aboard a ship, though. He was in naval aviation, so as a military brat, I had the opportunity to be in Hawaii. Of course, that’s where I was born, and we traveled to Japan where he was stationed for a couple years and been to San Diego, and he was also stationed at Moffett Field, and NAS Alameda. I’ve always had an interest in projects and science.

In grade school, I was always doing some little experiment. In high school, I worked towards the science area. I took many of their science classes and always enjoyed doing projects, whether it was photography or amateur rocketry or model airplanes. After graduating from high school, I enlisted in the Navy, following in my dad’s footsteps, except I didn’t do 23 years. I only did 4 years.

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But the Navy realized that I had an interest in electronics, so after boot camp they sent me to avionics school: aviation electronics. Again, I’m going into the aviation field just as my dad did. That was very interesting. After completing boot camp I was transferred to NAS Corpus Christi, Texas where I was stationed with a training squadron for six months before I did go to school in Memphis. After completing almost a year of schooling in Memphis, Tennessee I was transferred to NAS Alameda. That’s where my dad was stationed ten years earlier. It was fantastic! And it was also about 30 miles from home, from where I enlisted, and I

can't complain about my duty, definitely. I finished out my tour there, and it was interesting working on airplanes. I love working with airplanes. And at that time, it was in a transition where they were going from reciprocating motors to jet engines, and I think I preferred mostly working on the propeller airplanes. And I do remember working on one plane – the Navy designation was R4D.

We civilians know it as the DC3, which was the “gooney bird.” I mean, it was the workhorse of the Navy and Air Force during World War II. So I feel really lucky to be at that era of naval aviation. After I was discharged from the Navy in 1964, I went to San Jose City College to continue my education in electronics. The Bay Area was an ideal place for electronics – all the high tech companies were being formed there, and it was quite easy to find a position there as a technician. In about 1968, I hired on with Fairchild Semiconductor.

They were the pioneer of the microchip, and I stayed with them for approximately 14 years. I eventually needed a change, so I decided – I'll go into this in a little more detail later on – but I needed a change. So I quit work, and I went to a two-year program in marine technology at Orange Coast College in Costa Mesa, California – again, my interest in the underwater field. And it was shortly after I graduated from the marine technology program that I heard about Cordell Expeditions, and I says, “What an opportunity! I wanna volunteer! Here I am! Sign me up!” And of course, that led to ten years with the expedition.

Dewey Livingston: Elaine?

Elaine Dvorak: I was born in Washington, D.C. We moved to California when I was ten. And then when I was 18, I went away to college in Ohio. I went to Antioch College – Antioch has a co-op program, so I did some travel. When I finished Antioch, I went to New York for a couple of years, and then in a sort of roundabout way I ended up in Sausalito, California, and I lived there for 25 years. I tried to work in Sausalito. It's just a small town. There's not a lot of opportunities, and I became very interested in the bird life and marine life there in Sausalito with Richardson Bay and the ocean so close by.

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I found that if I volunteered my services when people had their boats hauled out and were working on their boats that I got invited to sail with them. So I learned a lot about boat work and sailing. And I took courses at College of Marin. Gordon Chan was a professor there at the time, and

anything he taught was a good class. And he had fisheries biology and marine biology and I just took whatever he [offered], and a couple of other of the professors there were very good. It's a two-year school, but it's in a wonderful location for studying the marine environment.

I really wanted to get out on the ocean, and I had an opportunity to work on commercial fishing – just to get out on the ocean. I might have preferred to sail to Mexico or something like that, but my opportunity came, and I took it, and I learned how to operate the LORAN equipment and the navigation and got more experience on – not sailboats but powerboats – the big diesel engines.

My first trip out on the ocean on a commercial boat was to the Cordell Bank with rock cod fishing where we would attach a heavy weight on the line and let it down to the bottom until it just touched, and then we'd pull it up about six feet. The line had a lot of hooks on it, and you'd let it soak for a little while and pull it back up and there'd be rock cod and the rosy rockfish and on the bottom of the line there'd be ling cod sometimes.

And coming up on the line would be juvenile fish, too. They would just get caught in the big line, a metal sort of a woven cable. One of the fish that I remember seeing was a little fish about two inches long and completely transparent with a fin along the top and bottom of the fish, and looking it up found it was a juvenile ling cod, and they were just all over the place. And it was also the first time I saw an albatross, and they had four of the black-footed albatross there, and I didn't know what they were. I didn't have a bird book out there, and I just watched them and watched them, and I realized that's what they had to be. I memorized the markings – the little white line around the back of the bill – and looked it up, and that's what it was; but they were just fascinating to watch.

Then Sue Estey introduced me to Bob Schmieder and the Cordell Expeditions. We were working on a mutual friend's boat, and she was telling me about what she was doing, and I was so interested. When I met Bob, I wasn't a diver particularly – although I did have my certification – but I had a lot of experience around boats. And I didn't know it at the time, but he was thinking of buying a boat.

A couple of weeks later, he called me, and he said he'd bought a boat, and I went with him to see this old fishing boat that he had bought. And so I got involved in the work parties and trying to repair the boat. I think that I suspected it was gonna cost him a lot more time and energy and money

than he thought it would. I was on the group that took the boat up to Sacramento. The engine stopped about four times on the trip, and we had to anchor it.

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Gary Borton was along, and he was real good at working on the engine. So they got it up to Sacramento, and then as often as I could I would go up when they had work parties in Sacramento. That's a long ways from Sausalito. And then I was on the group that brought the boat back down from Sacramento, and when we went through Suisun Bay – the boat had been sitting out in the sun, and the top sides were kind of dried out – and the water was just coming squishing through the planking in the front of the boat as it came slamming through Suisun Bay.

I had many years of working on boats that belonged to my friends, and sometimes even working on boats where I got paid to do it, and I tried to teach Bob, who had never even owned a rowboat – he'd been out on the boats, but he'd always rented – and so I tried to share as much as I could as fast as I could with him of the knowledge that I'd learned working on boats over the years.

And he's a real quick study, so didn't take him long to get very competent. And so as a result of working on the boat, again, like my experience with sailing, I got invited to come along and help provision the boat and do some of the navigation and transfer the boat to Monterey or where we were taking it. I came in right at the tail end of the Cordell Bank Expeditions. I did go on the last trip there, and it was really exciting to see the divers – how excited they were – and to see the specimens. I did a lot of specimen sorting so that I could find out what was down there.

When they would bring back the bags of specimens, we would put a lot of it into buckets of water, and we had an aquarium for the most interesting things. So I'd be pulling sea cucumbers and nudibranchs and anemones, the strawberry anemones and different things out of the collecting bags – the brittle stars. And then we also preserved them, and we would have sorting parties up at Bob Schmieder's in Walnut Creek and go and do that.

And we'd sort different kinds – you know, the brittle stars and the starfish, all the different mussels and things – and send them to different specialists all over the country for identification. And that was a lot of fun for me, too.

Jennifer Stock: With the commercial fishing, was that a boat out of Sausalito that you went on for your first trip out to Cordell Bank?

Elaine Dvorak: My first trip out to Cordell Bank was on a little Monterey fishing boat. It was just me and the boat owner – a tiny little, about a 32-foot boat with an old Hicks engine. And yeah, that was out of Sausalito. There's a fish dock there and a lot of commercial fishing boats. And then I worked on five or six different commercial fishing boats over the next year and a half in the herring fisheries, in salmon, rockfish and albacore.

I just loved going out on the ocean. And the nice thing about Sausalito is when the weather is nice in Sausalito, it's usually nasty outside, and when it's nasty in Sausalito it's nice outside. So a lot of our trips would be for three to six days, and we would just shutdown the motor and drift overnight. So we drifted on the Cordell Bank and woke up there in the morning. It's not anywhere near the shipping lanes, so you're safe to do that 20 miles offshore. Yeah, it was really a lot of fun. It was just high excitement for me to get out there on the ocean. And a little tough – there are a few women who do it. When we would run into each other, we would be really glad to see each other, because it's very much a man's world out there.

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Dewey Livingston: Approximately what years were you based in Sausalito? You said about 20 years.

Elaine Dvorak: From '72, I think, until '93.

Dewey Livingston: Now, when you'd go out on these fishing boats, would they specifically be destined for Cordell Bank, or would that be changeable? Was Cordell Bank a particular attraction?

Elaine Dvorak: For the rockfish, yes, that's where they went. For salmon, we would be anchored at Stinson Beach or Point Reyes – Point Reyes usually because you can duck behind that point and get out of the wind. And then we would go out and go up and down the coast from there. Where we would try to go would be – you watch the color of the water, and where the water changes from the green/brown coastal water to the blue – right on that border is where you find the salmon because I guess they like the clean water, but there's more food in the green/brown water.

And for albacore, we would go straight out to the Guide Seamount about 60 miles offshore, and then you can set your autopilot so that you go in a

slight circle, and you just circle, and there you look for birds. You look for the terns and where the terns are diving is probably where the baitfish are, and the albacore will be on the bottom driving the baitfish up, and the terns are on the top taking advantage of the proximity.

Dewey Livingston: Were there indications of Cordell Bank – for instance, birds – that you would look for there?

Elaine Dvorak: Yes, we would look for the birds there, and they had certain coordinates on their LORAN also, which were secret, and it was just a LORAN-C, and so they would be looking for certain coordinates, some of them I memorized them like phone numbers and told them to Bob when I had the opportunity. It turned out that some of the same places where the fishermen were going were the shallowest points.

Dewey Livingston: What was the so-called competition like with fishing out there? Did you see lots of other fishing boats? Were there certain seasons that were crowded or not or –

Elaine Dvorak: Well, fishing is done by season, and there was a controversy because at the time, a lot of Vietnamese people had come over here, and they were rigging up boats to do trawling, and if you saw one of those trawlers come through, you might as well pick up your gear and leave – go find another place, because they would just clean it out. They would catch everything and then throw back what they weren't allowed to keep, which would probably die, and then they would take it into Chinatown and sell it there.

We would catch sharks, too. Occasionally, we would catch seagulls because they would take the bait as you're putting the line out. That first year that I went out was actually the El Niño year, and it was not a good year for fishing. What I did see a lot of was the murre and the murre chicks, and you can tell the adult and the juvenile murre apart, and what I understand is that the female lays an egg on the cliff side. That egg is kind of oval-shaped – flat on one end and narrow at the other end so that it will roll in a circle and it won't fall off the cliff.

And when the chick is just a couple of weeks old, then the chick jumps into the water, and the father then takes the chick out and feeds it for a couple of weeks and teaches it to dive.

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And the females will then go down around Point Sur in big flocks and they're feeding to make up for the depletion that would have happened with creating such a large egg.

Dewey Livingston: Did you see that trawling activity happen at Cordell Bank specifically?

Elaine Dvorak: Oh, yes, and when we saw them come through, like I said, you just pick up your gear and go somewhere else because it's gone.

Dewey Livingston: And did that tend to be before Bob and the Cordell Expeditions were going? Are you talking about the '70s –

Elaine Dvorak: That's the same period of time. I was out there fishing when Bob was on the Cordell Expeditions, because the year that I started working with Bob they had already petitioned for the marine sanctuary and the meetings – the town meetings I guess – it was in the '80s that I was doing the commercial fishing, and so they were out there diving at that time.

Dewey Livingston: This is of interest because although we're here to talk about the dives, we haven't really talked to anybody about commercial fishing on the bank. So is there anything else that comes to mind that you think might be of interest specific to Cordell Bank in your fishing experience?

Elaine Dvorak: Well, I'm very glad that the fisheries have gotten together and limited fishing at certain depths, I think that's how they've done it. I knew a lot of the names of the people who were at those meetings. Because Cordell Bank is a very important place for the juvenile fish, and if you don't let them reproduce, then you're not gonna have a fishery.

Jennifer Stock: Do you happen to remember any of those names, or is that something you might remember over time?

Elaine Dvorak: I would certainly remember from a list. There was a Cass Gidley or something – was that his name? I would remember them if I saw a list.

Dewey Livingston: Not Cass's Marina? Not that Cass in Sausalito?

Elaine Dvorak: It could be the same family – yeah.

Dewey Livingston: Do you recall the names of any of the commercial fishermen?

Elaine Dvorak: Well, some of the ones I fished with, yes.

Jennifer Stock:

This is just an aside. It's really interesting because this is not a lot of information we have, so I'm really glad you're sharing what you have here.

Elaine Dvorak:

Well, one man that I fished with a lot was named Dennis Chelini. It'll take a minute to remember the name of the boat. But it was a wonderful boat. It was an old boat, and he fished for many, many years. He fished the herring, he fished the rock cod and salmon and albacore. He had all the permits. Number seven was his fishing license number. Oh, I can't think of the name of the boat right now, but it will come to me.

Dewey Livingston:

Sue, you told us about your educational background. What brought you to diving and going out there in the ocean?

Sue Estey:

I was thinking back to Cornell where I was the biochemistry major. I had to take botany and zoology among other things. And in the zoology class, it was my first encounter with a sea anemone. It had been preserved in formaldehyde, I think, and it was this really ugly kind of brown/green icky-looking gushy thing. So that was my view of a sea anemone until I went snorkeling in the ocean.

And the other thing that I thought about was that when I was pretty young, I was given a brownie box camera with the kind of thing, you had to hold it at our waist and look down, and it had a mirror, and it looked out, and so I started taking pictures at a pretty young age and haven't stopped yet.

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So most of those things kind of feed into what I ended up doing later. I was living in Sonoma County in Sebastopol, and I took scuba lessons. First of all, I met some people who went ab diving – abalone diving. The first time I went, I rented a wetsuit. I was very nearsighted, and I had a mask with no lenses, and they took me up the coast to a really big tide pool north of Jenner, and we climbed down the cliff and get in this tide pool, and I was nose-to-nose with the sea urchins; since I was so nearsighted, I could see all the little tentacles kind of wiggling, and so that was really the start of my getting interested in getting in the ocean. After we'd done that probably twice a weekend for several weeks, I took a scuba class up in Santa Rosa, Sonoma Coast diving – so that was 1975 when I got certified in the fall. And a few years later, I bought a used Nikonos that I saw advertised at the dive shop. I finally did my first underwater photo at Monastery Beach. I think it was New Year's Day,

and the waves were like one inch high, which is pretty miraculous for Monastery Beach; that was December 1978.

And then it must've been that winter when Bob Schmieder and a couple other guys came to the Underwater Photographic Society meeting to talk about this place, Cordell Bank, and they wanted some more divers to come out and help document what was out there. And at that point, I thought, "This sounds like a really good reason to go diving, because I can use my camera, and I can take pictures," and I wanted to do it.

So meanwhile, I'd been going to Sonoma State and taking classes, and they said, "Well, why don't you just go for another degree?" probably because that gives them more money for the school. Anyway, so I took a number of marine biology classes out there and marine ecology and plankton identification and quite a variety – they were good classes, and so I was getting to know the marine environment and to understand what it was I was seeing and taking pictures of.

Dewey Livingston: So more for your own pleasure rather than your career – you were working?

Sue Estey: I was working in a lab for ten years there, but then I applied to graduate school. So I went from Sebastopol to Menlo Park and graduate school in pharmacology at Stanford – not very sea-related, but I did diving while I was going to school.

Dewey Livingston: So diving was your primary activity outside of work.

Sue Estey: And mountain climbing.

Jennifer Stock: Cordell Bank is a mountain.

Sue Estey: Yeah, right – you have to sink down to it instead of climb up to it.

Dewey Livingston: Well, we'll get back to being prepared for diving on Cordell Bank then. Don, do you have anything you can share about your getting into diving and leading up to this point of when you would join Schmieder and his group?

Don Dvorak: Certainly. I go back to 1970 when I bought some used scuba gear. I only bought it because it was a good deal, and so now I have scuba gear. What do I do with it? The next step is to find a local dive shop and take a class to certify. And I did – in 1970, I finished my program, and I was a

certified diver. During the class, they took us to Monterey, and we did our checkout dives or practice dives, and I found that very interesting in a marine environment. So I continued to dive in the Monterey/Carmel area with my new dive buddy from class.

And for the first year, I was quite content just to be a casual observer to look at the marine life – anything from a nudibranch to a tubeworm to the giant kelp forests. It was so diverse in our underwater environment. I just found it fascinating.

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That lasted for a year, then I got kind of antsy. I wanted to do something else, so I took up spear fishing. I did that just for a few months there, I managed to bring home our evening meal a couple of times. I lost interest in that, and the next step was underwater photography. As I mentioned, I was project-oriented. In high school, I did black-and-white photography where we developed our own film and printed our own film, and that interest always stayed in the background. So it resurfaced when I wanted to do underwater photography.

I started out with a very inexpensive Instamatic camera. I built a plastic box around it with the means of pressing a shutter button, and I added a flash reflector where I used flash bulbs. Yes, it worked, but it was very bulky. But I did get my first results of underwater pictures, and underwater photography is expensive. So I finally moved into the Nikonos world – bought my first Nikonos, and then you buy a flash, and your pictures start to improve. And then you want another lens, then another lens, and then you want close-up extension tubes. Extension tubes are just perfect for Monterey because of the visibility – you can take close-up creatures – and there's just a vast array of colors and little organisms.

And photography just kept my interest, and it just piqued my interest in the marine environment. And I decided, “Wow, maybe I want to get a job in this field,” and I decided to quit work. I found a two-year program in Orange Coast College. I could do a two-year program through the veteran's benefits and personal savings. I could survive for two years, so I moved to southern California and started the program. It's called Marine Technology. It's not specialized in any one field. It gives you introduction to oceanography, marine biology, seamanship and navigation, then you can decide where you may want to branch out from there.

And those two years were just a wonderful two years of my life. I didn't have to work because my savings and GI benefits, and I didn't have to

take a full load because I had some transferable classes from my electronic technology several years ago. And I enjoyed that – just taking my classes and doing well. I was ten years older than most of the students, and I think I was a little more serious about this program. And I did well. I got good grades. While I was there, I also took a parallel program in environmental technology, too. It enhanced the environment aspect of my interest.

After graduating, I thought, “Well, now it’s time to find a job.” I moved back to the Bay Area, and there were no jobs – very few. There was the USGS that had maybe an opening, but you were competing with people with their Ph.D.s, so I finally realized that I was not going to get a job in the marine field. So I went back into the microchip high-tech area and didn’t have any problems finding a job. And the high-tech area was good for me. I enjoyed electronics, so I stayed back in that field, and I joined the local dive clubs and the Underwater Photographic Society.

And I clearly remember in the dive club called the Sea Era Divers, a spinoff from the Loma Prieta Sierra Club. I would attend their meetings, listen to the guest speakers.

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Bob Schmieder placed an article in the newsletter of the Sea Era Dive Club for a call for divers to explore Cordell Bank. For some reason, I did not get to that newsletter for about a week or two. When I saw it, I said, “My gosh, this is exactly what I’m looking for!” I called up Bob, told him, “I’m a scuba diver, underwater photographer. I’ve been to Marine Technology School. I’m really interested!” And he says to me, “Well, we have our full complement of divers.” I think he must have heard my deafening silence and my heart drop to the floor, and he says, “Well, why don’t you come along anyway?” So I did!

And there was just so much interest from other divers, and we knew this was going to be a difficult dive. We’re offshore, and we’re in open ocean, and it’s deep, and it’s dangerous diving. It’s going to be decompression diving. We need special, talented people with skills to do deep diving. During my stay down in southern California, I had gone to La Jolla Canyon, and I dove to 120 feet during the squid season. So I had some experience with the deep diving, and I felt confident that I could do it.

But during the early days, there were so many committees – I mean, we had to be sure that we were doing the right thing. We had to learn about safety aspects of deep diving. We had to study and learn about collecting

specimens. There were photography groups. I think Bob said he made as many committees as there were people, so each person could be a head of a committee. Of course, underwater photography was my main interest – and of course, safety. We had no idea what to expect out there: sharks, cold, dark.

But we decided that there were three main requirements that every diver had to adhere to. A diver had to use twin-72 tanks or larger. A diver had to have a depth gauge that went to the depths that we were going and a bottom timer. And all our dives would adhere to the U.S. Navy dive tables for decompression. So we were all on the same page, so to speak. It was for about a year at that we did our preliminary committees and exploring possible difficulties, and finally in 1978, we were going to go to Cordell Bank and conduct our first dives.

It was difficult because we didn't know exactly where the pinnacles were – where the pinnacles said they were on the chart, they weren't. So we spent a great deal of time just charting the bank looking for shallow places to dive. And I think I went on just about every trip up to Cordell Bank except for one, I was scheduled to go explore the Grand Canyon. Wouldn't you know it, this is the time they made their first dive on Cordell Bank. It took me a while to get over that. It was just a great disappointment. But somebody said to me, "Maybe there was a reason why you weren't there."

The reason is I'm still here to go on the next dive. So I accepted that. It helped a little bit. But we did get two teams down. We did get a first glimpse of Cordell Bank, and so now the expedition is a success, but we need more. We want more – more photographs, more specimens. In 1979, I was on many, many of the trips out, and I was on the trip that Tom Santilena, Bill Kruse and John Santilena made their dive. And I think I was suited up to be the second team down.

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As it turns out, on that dive, the anchor did not set, and it drifted off the bank, so when the three divers went down, they found that they were not on the bank, but they could see the bottom, and they made a decision to go down and get some samples and get some pictures, and they came back with their samples and their pictures and some very interesting stories. But because we drifted up the bank, that terminated the diving for that day. In fact, that was the only dive that year. Fortunately, we had the opportunity to go to the bank and get some information. So again, major

disappointment, but it never hampered my enthusiasm. I was in there for the duration.

Sue Estey: Do you know when that was – that trip?

Don Dvorak: Oh, the 1978 or '79? '79 was – actually, I don't have it written down here. Yeah, I did have it written down somewhere, but it was in I think October. That was, of course, in the window of the best diving.

Jennifer Stock: So at this point you hadn't dove on Cordell yet?

Don Dvorak: No.

Sue Estey: Two years.

Jennifer Stock: So '78, you visited the Grand Canyon. Next year the anchor broke during that one dive.

Don Dvorak: Right. So during the time we were preparing – that was the first year – so '78 was the second year of the expedition they made their first dive, and then '79. So those three years, I was in preparation. But things turned around in 1980. During the first two years – or actually the first three years, we were working on our learning curve. We learned quite a bit in the first two years. We learned how to find the bank through our surveying.

We learned how to deploy the anchor so it would fall right where we wanted it to, learned how to deploy the transect line. So in 1980, we were really ready. We were higher up in that learning curve, and we perfected our techniques. And in 1980, I made three dives on Cordell Bank. So it was now a success for me. I was part of those people who had dove down in Cordell Bank, and I stayed with the expedition all the way to the end, and every year you learn more. You want to contribute more and improve your techniques.

I typically use two cameras. I use a camera with a close-up lens so you can look at an individual specimen or species. Then I would back off and use my little wider angle lens so I can look at that species in the community. I thought that would be helpful in describing the bank. Bob Schmieder says, "Well, could you do some available light photography in Cordell Bank?" and I kinda scratched my head and said, "Well, I don't know. It's pretty dark down there." Even though we could see our gauges and see the bank, I didn't think it was bright enough to do available light.

So I added a third camera to my bracket, and at least it was without a strobe. And I found a film rated ASA 1600. It was a color print film, so I tried that, and I shot at 1/30 of a second at the widest opening. And surprisingly, I got good pictures. You could see, it's more like a landscape picture. So I tried a little bit more diversity with the cameras. What was interesting is the different divers of the group – they all had their different techniques for photography.

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Sue Estey used the macro lens, and extension tube, so she could get right up on an individual and look at it. And Bill Kruse, with his two Nikonos cameras with 15mm lenses and these great big subsea strobes – I mean, that was a monster to manage underwater, and that was very impressive, and he's responsible for gathering some of the very interesting wide angle pictures, especially the holes that we found – the mystery holes. He got a picture of Tom in there, and he took a self-portrait of himself in one of the holes.

But he also took some wonderful pictures that documented the divers deploying the transect lines. It was important not to just get the specimens, but to document the expedition and the people in it and how we did things. So he's got some wonderful pictures there.

Dewey Livingston: Bob Schmieder in his interview said about a picture that you took of rosy rockfish – he said, “That's an image that never goes away; it's become a classic photo.” And do you agree with that, and where would you place your contribution in the photography of Cordell Bank?

Don Dvorak: Well, I feel fortunate that I had this opportunity to go to Cordell Bank, take pictures and eventually these pictures were used in publications and helped describe Cordell Bank. But that was one of my utmost interests. Here Cordell Bank is sitting out here 20 miles offshore, and it's literally undescribed. Cordell dropped a lead line on the bank and using a special lead he collected samples, and they're still preserved over in Washington, D.C. Dr. Hanna collected – did some grab samples of the sediment, and those are the only specimens from Cordell Bank.

It's sitting there undescribed. Can you imagine something so close undescribed? It's just a magnet; “Come out here and describe me!” And that was my motivation – my personal goal. And it was through photography. And there's three pictures that stand out in my mind. One is the rosy rockfish. I don't think I ever seen a rosy rockfish until I went to Cordell Bank. They typically live at 50 feet or below, and I don't recall

seeing one in my other local diving, and it was used in one of the brochures for Cordell Bank.

That was a special satisfaction. And another picture is the white metridium with the starfish and the hydrocoral around it. To me, that typifies the Cordell Bank, although I only seen metridium once because it grows deeper. And it's, again, particularly gratifying that a Cordell Bank picture ended up as a cover picture on *Science News*. It further legitimizes our purpose for being a Cordell Bank. And also in the *Defender Magazine*, Sue Estey has a close-up picture of corynactis. Again, it just helps.

Dewey Livingston: Now, had you heard of Cordell Bank before you ran into Bob Schmieder?

Don Dvorak: No, I didn't. When he talked about Cordell Bank, I found a chart, and I found out where it was located, just off the coast, and the chart just shows a 20-fathom pinnacle, and that is all I knew about it. Later on, I found out, wow, it's undescribed.

Dewey Livingston: Sue, could you tell about your introduction to Cordell Bank and Bob Schmieder and the expedition?

Sue Estey: I first heard about the place when he came to the Underwater Photographic Society meeting and asked for assistance.

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He said where it is, what it was and what they were doing, and asked for help, and that had to have been after the first trips out there, I think, because it must have been winter of '78 or '79. So I don't have any record of doing practice dives before a Cordell Bank trip. But in my dive log, I have notes from two different weekends in 1979 – one end of October and one mid-November. The first one, we went to Cordell, but my note says, "No diving." And I do remember spending hours on the back deck of whatever boat it was getting seasick over the side while they were going back and forth and mapping, because that's what we did.

We used the LORAN and the depth-sounder, and somebody would be writing down the numbers, and somebody would be reading off the two instruments, and we just went back and forth and back and forth just methodically recording and finally understanding what it looked like in terms of the topography, because otherwise without that we really didn't know where the so-called "shallow spots" were. So October was probably doing that, but the November trip unfortunately was aborted because the

skipper hadn't checked his fuel tanks, and we got to the Farallones and ran out of diesel and had to be towed back in to Fisherman's Wharf by the Coast Guard – on Sunday – and they called their relatives and got help to get fuel cans to get enough diesel to get it to the boat so we could actually take it back to its dock.

So that was kind of a loss. And then September 1980 was my first dive on Cordell Bank, and I was with Don and Harry Sherman, and I was a little anxious. We went down the descent line, and I did my best to get there as quick as I can. I could just see the bottom, and I felt like I was going to pass out. I was just like – starting to black out – and I thought, “You know what? You better not stay here if you're going to black out because you could just keep on going down.” And so I headed back for the surface, so I didn't have the time to tell my dive buddies. And they noticed I wasn't there pretty soon.

So that dive was not very useful for me or for them, but I did see – you could still see this incredible array of stuff, even just what little I could see. So it wasn't until 1982 that I did my first real dive and took pictures.

Dewey Livingston: Could you describe the feeling, the sensation of going down there and seeing it for the first time?

Sue Estey: You go down the line, and it takes a while to get far enough down to see the bottom, because it's probably 120 or 130 or 140 or 150 feet deep. So you're in the middle of the water column, and you just keep on going, believing, hopefully, that anchor [was in place] – at the beginning, I was not one of the first divers, so I was not the one to find it hanging loose in the water. By the time they put me in the water, they knew there was a bottom at the bottom of the line. But the pictures give you a clue that if you dressed in the brightest combination of red, orange, yellow, pink, you'd be in camouflage for Cordell Bank. It's really amazing.

I suppose we couldn't see these colors except for the corynactis that turned out to be fluorescing underwater. They were pink even in the blueness of deep water. But if you used your flash or a flashlight you could see the colors. Pretty amazing. And the visibility out there was way better than anything I'd ever experienced diving off the Sonoma Coast, which is where I learned. There, if I was lucky, along coastal diving, I would hold my hand out in front of my face and see how far I could still see my hand,

and if I was lucky to see my hand, I'd look and see if I could still see my feet. But at Cordell, the visibility was real good – tens of feet at least.

Dewey Livingston: On your first dive – and this would be the first one where you got to spend some time down there, which I think was '82 – did you feel like you had time to take it in, or did you keep busy with your photography instead of trying to get a sense of what it's like to be down there?

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Sue Estey: The time on the bottom is maybe 15 minutes. It takes a while to get there. Then you try to get your camera set up to have the light work with where the lens is focusing, and there's so much to keep track of – you've got to keep track of the time, your depth, the film in the camera, working – so you get a kind of general impression, but you've got to do so many things while you're down there, and you're down there for such a short time that it's hard to – I saw the color, and I could see that there were sponges and things, but you don't have time to linger on and enjoy the view really.

Dewey Livingston: Don, what was your impression after first facing this incredible place?

Don Dvorak: Well, I have to start with before we get to the bank. We're on a long trip coming out of Drake's Bay or –

Sue Estey: Or Oakland – Alameda.

Don Dvorak: Right – and you just have a lot of time to just think about it, and it's not much to do, and it's interesting, but kind of boring.

Sue Estey: But lots of time to worry, too.

Don Dvorak: Worry, yes.

Sue Estey: Yes – who knows what the conditions are going to be like? Am I going to be seasick? How cold is it going to be? Will I get to the bottom and the top alive?

Don Dvorak: Yes, yes.

Sue Estey: I mean, there were years where I just said, "This is crazy. I'm not going."

Don Dvorak: Well, I didn't feel quite crazy, but it always was on the back of my mind that it's dangerous. But if we cruise out, we're on the bank, the weather looks good, we find a place to dive, we deploy the descent line, and Bob says, "All right, suit up. We're diving," and it takes a while to get your gear ready and get your camera. But all the time you're thinking, "I'm

gonna be diving deep. Is there gonna be a current?" and you kind of get little butterflies in your stomach.

That's not to say I didn't want to go. I wanted to go, but there's always that feeling. You're in a foreign environment, and when I was down there I never felt as if I belonged there. I'm going to have to leave. I'm in a serious situation. But after you get your equipment ready, you get your gear on, and they say, "Okay, jump off the boat. Get in the water. Go," all those feelings went away. Now, my focus is on the task at hand. One is to get down the line and start my picture-taking.

Safety was always, always stressed. I've been on three dives where the dive was never completed. If somebody felt they didn't want to be there any longer, that's the most important thing. We terminated the dive, and that's fine. That is the most important thing.

I'm on the descent line, and Bob says, "Go down slowly. Do not rush down there. Let yourself get used to the depth and get used to the narcosis." We all knew we were gonna be under the effects of narcosis. You get to the bottom, take a moment to look at your dive buddies, see if they're doing okay, get acclimated to the bottom, gather your thoughts and then go about your business.

And that technique worked. When I was down on the bottom, I knew I was under the effects of narcosis. The first effect is tunnel vision, and because we had trained so much, he wanted to monitor your depth, he wanted to monitor your time and your air, so I would find myself doing this like every 30 seconds, looking at my gauges, looking at my depth, looking at my time. That's what my mind was programmed to do, but I continued on taking my pictures. And when I was down there, I also got this feeling – there's a little bit of current flowing over the bank.

It's manageable, and I do not want to follow the current flowing over the bank down into the abyss. That's in the back of your mind, but was really not a serious thing.

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It's just what your mind does to you when you're under the narcosis. And I remember the bank just burst forth with all this color. There's the yellow, the oranges, the purples, the reds, and that's what I'm seeing. But that's not what is there. You lose all your reds, but my mind under the narcosis puts those back, and those colors might just jump out at you for a

fraction of a second when your flash goes off. So I think your mind retains that. But it's just amazing to see the abundance, because it was just such a competition for a little niche where I can build a house and grow, and you'll just see the tunicates surrounding the hydrocoral and just taking over the neighborhood.

It's just very expensive real estate, essentially. But that's one of the pictures in my mind there. And again, it's just the safety that's the most important thing. And after your dive is completed, after 15 minutes, you just go up slowly, and the narcosis goes away. And depending on your depth, you might stop at 30 feet. We always over-decompressed. You never can go wrong by over-decompressing – 20, 30 and 10. And at 10 feet, I'm hanging off there, there's no more narcosis. Now I'm aware of how cold it is. When you're under the narcosis you don't feel the cold.

I'm hanging on the T-bar and just kind of shivering and trying to feel my fingers to see if they're still there – the numbness – and you try to take your mind off that. You might look out for any drifters, plankton or *Mola mola* [ocean sunfish] drifting by, or you might play paper, stone, scissors with your dive buddy, but there was always somebody topside there looking after you. There was always a safety person. And when we were on the decom, they would come down and grab our gear and just kind of look at us, make sure our pupils were okay or something – but you know, they were just there for our safety.

And finally, you got back onboard, and you have a chance to think about just what happened. It was difficult for me, because I got these terrible headaches from deep diving, I guess from the excess carbon dioxide. They would last for a couple of hours. I said, "Bob, I don't think I'm gonna dive tomorrow," and then in a couple hours, "Bob, okay, I'll dive tomorrow." But the whole back of the boat was just filled with enthusiasm. People would just say, "How did it go? Give me a description. Debrief. Let's look at your samples. Let's put them into the formalin, and let's separate them."

But I'd like to talk a little bit about the people – the divers. Now, we're on a boat full of divers, full of gear, and a lot of the people were somewhat new to us. But never do I remember any real conflicts. We were all just had the one point of view of what we needed to do. And it was a fun group.

Everybody was interesting. They all had their different backgrounds and different specialties. Tom Santilena and Bill Kruse were very valuable to the expedition. Tom – one of his primary functions was to set down the transect line. He was typically the first diver down with Bill, and they're the ones that set out the transect line that was our breadcrumbs back to the ascent line so we could follow that out and move off a little bit and come back to it, but we knew where to get back. So those were two very important divers.

And the Sacto team – these guys were just incredible. They were fun divers. They had a real sense of humor. I enjoyed working with them.

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I remember on one occasion, Bob asked one of the Sacto divers to put a strobe light on the descent line. We'd developed a technique that we would put strobe lights 10 feet, 20 feet on the descent line off the bottom, so this was a beacon telling us where to get back if we lost our orientation. So okay, Sacto diver went down and put a strobe light on there, but these guys have a real sense of humor. At that time, there was a beer called Stroh's Light. You may have heard this story. So he took a beer can and tied it to the anchor line and said, "Bob, there's your Stroh Light." In fact, me with my little bit of sense of humor a few days later when we had a meeting at Bob's, I went and got one of these little cans of Stroh's Light, and I put a little plastic cover on top of it, put it on a nice little wooden platform, and put a bulb in it that blinked on and off and said, "Bob, this is a symbol of your expert means of communicating with your people."

Another thing the Sacto team did – on one of the dives, they were one of the earlier teams down, and they came up, and my time was to go down. I'm going down the descent line. Let me talk about the descent line. You jump in the water – you're on the surface, and you see the main vessel, you see the zodiac, you see the safety divers; that's the security blanket. And you start down the descent line, and then you find yourself like it's the loneliest person in the world. You do not have contact with the top, and you don't see the bottom. You're sort of in this in-between zone, and it's kind of a lonely feeling to me.

But you slowly make your way down, and you can see some of the brighter spots kind of come into view. Now I see where my goal is, and the closer in then you see all the corynactis and the bright colors. But going down that descent line it's kind of a lonely feeling for just a minute

or two. Back to the Sacto team – I had mentioned they were one of the earlier teams down that day, and I followed them, and I was going down. I see a white spot, different from the other white patches I’d seen previously. And I get closer and closer and closer, and I can see it’s about two and a half – three feet wide and about two feet high, and it’s the sign.

The Sacto team had wrote on a piece of cloth – a paper – that says, “Welcome to Cordell Bank. We hope you enjoy your stay. Compliments of the Sacto team.” And of course, I had to take a picture of that. So these are the kind of people we worked with. There was just so much compatibility – so much brotherhood, if you will, sisterhood, too. We just were a cohesive group. And you had to be. You’re on a small vessel with a lot of people onboard and just prior to your dive there’s just gear adrift everywhere.

And you couldn’t walk around but bump into a person or stepping over a piece of gear, but that was okay. We were a group. We had a task, and it was just absolute joy working with the Sacto team and other members of the expedition.

Dewey Livingston: Was there any sense of friendly competition amongst the photographers or the people doing various tasks? Is that a question I can ask?

Don Dvorak: Oh, yes – in Bill Kruse’s interview, we talked about who could have the most cameras on a bracket. I think I won that with three cameras. It wasn’t so much a competition. It was just a means to bring back more information. So I had three cameras, so I won that – but I think Bill had the most impressive camera setup with those two 15mm lenses – these great big strobes. How he managed that underwater, I don’t know. But he was a real asset to the expedition.

01:15:12

Jennifer Stock: Sue, how about for you. Were you one of the only women that dove on Cordell Bank?

Sue Estey: I think there maybe were three women or four – Susan Dinsmore, there was the nurse whose name I don’t remember. I don’t think I was ever out with her.

Don Dvorak: Yes, and there was another one – there were three other ladies besides yourself.

Sue Estey: At different times –

Don Dvorak: Yes, and I dealt with at least three of the ladies. Lori Talbot.

Sue Estey: Yes.

Jennifer Stock: But you were the main one that stuck with the expedition.

Sue Estey: I lasted longer, but Susan Dinsmore brought more equipment. She had her own inflatable boat that we took out sometimes.

Dewey Livingston: So it wasn't a rarity having women divers taking on such an intense expedition.

Sue Estey: I think it was rare – I mean, against how many men who were out there – it was rare.

Jennifer Stock: How was that for you?

Sue Estey: I liked it. Plus, I didn't have to drag the doubles back up to the compressor to fill them. You know, there were certain perks to being probably the weakest in terms of strength.

Dewey Livingston: Something I'd like to ask, similar to Don talking: on your first dive, what was it like for you coming back up and getting back on the boat and the feel of, wow, you've just been down there? Is there anything that comes to mind about that?

Sue Estey: You mean my first aborted dive or my first real successful dive?

Dewey Livingston: Well, both, but I guess I'm leaning towards the first successful dive.

Sue Estey: Well, the whole project for me was – when I wasn't too scared to go at all – pretty exciting. And being able to take pictures and contribute information to the treasure trove we were compiling, really, I was very proud of being able to do that. The camaraderie on the trips was really good, and it felt good having people take care of us. I mean, Bob would set up a list each time of the dive teams – who would be going first, second, third, and who they would be with – and so that was a good way to start.

You knew where you stood and what order you were hoping to get in, assuming the first dive went well, and sometimes it did. And having to dive with twin tanks – it's a challenge managing that, and especially when you're out on the open ocean, and it can be kind of rough. So there were

always people helping us get dressed. I remember sitting on the rail of the boat and people would come and bring your tanks, and somebody else would help you get into them while they were steadying them so the tanks didn't go overboard before you did. And there were always people in the inflatable zodiac, so we would go in off the main boat, hopefully close to the zodiac.

The zodiac was at the descent line, so once you got there we could go down the line from there. And when we came back up, as Don said, there would be people to meet us at the ten-foot level, come down and get our cameras, people to haul your equipment into the zodiac when you were done and bring you back to the mother ship and help you get back on board. So we all did a lot of helping each other. That was really good.

Dewey Livingston: It must've been some feeling to come up from your first dive and having seen what you've seen and –

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Sue Estey: Yes, you try to tell them what you saw. That was part of the deal, to debrief and say, "This is what it looked like," and if you were any good at all, this is kind of the topography and the shape of things, and some people were way better at that than others.

Jennifer Stock: I can imagine that coming back to the surface and seeing everybody again, there's just this adrenaline running in your body and your mind, and did you feel like you just had to tell somebody immediately about what you were feeling or the excitement?

Sue Estey: Yes, yes, yes – you definitely started talking when you got up.

Don Dvorak: One thing that was important to me about Cordell Bank was, this wasn't just a thrill dive. We weren't thrill seekers. We weren't going down to get a narcosis high. We were there to conduct some scientific research, and like Sue and myself, we had some background as technicians or scientists that when you go somewhere and you make observations, you need to write all this information down, or if you collect something, all these samples and specimens need to go somewhere.

I knew the importance of documenting this, and Bob stressed the importance of it, because this was not just a fun dive. This was for "real science," and that was one of the most important things to me.

Dewey Livingston: What did you tell people that you knew – family, whatever – when you came back? I assume it was a big deal. “I just went and did this.” What did you tell your friends and associates?

Sue Estey: “I cheated death again.”

[Laughter]

Sue Estey: I don’t remember really.

Don Dvorak: Well, I was rather proud that I was part of this group. I stress the importance of going to Cordell Bank and doing something that few or no people have ever done. And I was doing it under serious conditions. But there were several, several gratifying moments about the expedition, but one of the most gratifying was I was at work, and my boss, the founder of the company I worked for, came in with this *Science News Magazine* – he subscribes to it – and he says, “Cordell Bank – you’ve been there. You do that.” I says, “Yes, that’s my picture!” That was very gratifying.

Dewey Livingston: Is there anything else that we might be leaving out about your first dives? We still haven’t talked very much about the subsequent dives, but you talked a bit about the preparation and the description of your first dive and your impressions. Were you also collecting specimens? You seemed to indicate that you did, but were you totally focused on photography?

Don Dvorak: For me, my main objective was photography, but I felt that I wanted to grab something and bring it back just to have that experience of bringing a sample back. But of course, my job was to photograph.

Sue Estey: And I felt that the job was really to use up all the film that I had. So you had 15 minutes to take 36 pictures.

Dewey Livingston: As you approached the photography being down there, and you didn’t have much time, did you try to have a plan in mind of what you were gonna photograph, or were you spontaneous? What was your approach?

Sue Estey: What I remember is the transect would be there, and I’d swim along the transect line and take pictures along that. That was really the plan, to have some kind of known track.

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Don Dvorak: For me, it was mostly random. It’s hard to plan a dive when you don’t know what is there.

So I didn't say, "I'm gonna start high and work low or low and work high." I just looked at some of the marine organisms that may be of interest, and you just run along the transect line, or I'd just move off of it a little bit if I saw something interesting. But besides the live organism marine mass, I also made it a point to photograph the sand deposits. I always think of sand deposits as little pieces of gravel and rock, but these are all organic. They're pieces of dead things that have fallen off, and you see chitons.

You see the hydrocoral, the spicules, spine – some urchins. I made a point to photograph that. And also I noticed what organisms were grazing on the sediment or shell pile. And of course, that's a history right there. And the expedition made a point to bring back. You can develop a species list from dead organisms – their tests and shells and spicules.

Sue Estey: And plus, there's things that live in that sediment, too, that you never see.

Don Dvorak: Oh, yes!

Jennifer Stock: What type of things did you see living in the sediment?

Sue Estey: I didn't see it, but when you bring it back up and look with a microscope, you can start to find things – sand on beaches has things living in it; same underwater.

Don Dvorak: There might even be forams in there, which we don't see, of course. But I did see starfish grazing and little gobies grazing. That might be a nice area where the detritus falls into and the grazers will come in.

Dewey Livingston: Did you shoot any movie film, or was that all left up to others?

Sue Estey: I did not.

Don Dvorak: No, mine was primary still.

Dewey Livingston: Quick question about recordkeeping: after these dives, would each of you, Don and Sue, write something up either for Dr. Schmieder or for your own reasons? Was there a certain amount of recordkeeping that was required of you, for instance?

Sue Estey: We wrote things down, and we also told them what we saw. I think sometimes they had a tape recorder. So I was looking in my dive logs, and they're pathetic. I think I had filled it in later from the pictures I take,

so I would go back and say, “Okay” – I’ve got like a two layer – I’ve got a Cordell Bank and what day it was and – I numbered my rolls of film, I think, so I would put that down. But my dive log has really no useful information. I must have just written it and spoken it on the expeditions themselves and turned in my pictures.

Don Dvorak:

It was very important that we documented our dive. This was one of Bob’s rules. I’ll be melodramatic – Bob says, “If you don’t write it down, it didn’t happen,” which is true. I mean, if it’s not written down and preserved somewhere, who’s gonna know. But when we returned to the boat after our dive – the main vessel, he required us to draw a little map of what we saw and the area we dove.

01:30:00

Sue Estey:

And I wonder how many of those maps agreed with each other?

[Laughter]

Don Dvorak:

Right – there’s so many interpretations. There were some people that were really good at sketching, and I wasn’t one of those people, but I did the best I could. And you either wrote down what you did, saw; or you would speak into a recorder, and somebody had the task of transcribing all of that. It was a lot of dialogue. But besides the marine ecology there, he wanted to know about us – how we felt. Again, we’re concerned about safety.

Did you manage your depth well? Did you manage your air well? Did you manage narcosis well? What was your starting tank pressure? What was your ending tank pressure? What’s the length of your dive? Those are all important, but not particularly scientifically important. But it was to maintain the safety of the expedition.

Dewey Livingston:

You indicated you turned your photos in to Bob, so the photos belong to the expedition rather than to yourselves, or did you have access to your photos? How did that work?

Sue Estey:

I think that I may have my original pictures, because there was a big project to make slide duplicates to be used in slideshows and for records.

Don Dvorak:

Yes, Bob took all of our originals, and he made duplicates, and he returned the originals to us. So most of the divers retained the originals, which made be bad in some sense because we had the originals, and someday I’ll have to figure out what to do with those, and all the pictures and slides and

negatives that were scanned, they were scanned from a dupe, which is of course not the best resolution. So someday, I would like to figure out how I can transfer my originals to somebody that can really use them and be useful, because my relatives when I'm gone won't know what to do with them.

Sue Estey: They'll know exactly what to do with them.

Don Dvorak: Oh, yeah, heaven forbid – they'll wind up in the garbage can. And that'd be a shame, wouldn't it? I need to figure out how to distribute those somewhere, either the Sanctuary or the Cal Academy would be interested in those?

Jennifer Stock: Definitely.

Don Dvorak: Yes – but Bob was meticulous. He numbered every slide. So you could take that picture with that number and correlate to a date and a time and a place where that picture was taken. Again, that is the importance of documentation. He was very meticulous about this.

Dewey Livingston: I'm a photographer to some extent and a great believer in the original image and the original piece of film, so to me that's a really important point that if Cal Academy has been scanning a lot of slides, well they should really be scanning the originals. Especially in those days, the reproduction of a slide was not of the highest quality unless you went to the real high-end places.

Don Dvorak: And the other important thing is the longer we retain these slides, they're gonna slowly deteriorate. They'll start losing some of their saturation and color.

Dewey Livingston: So we'll take a break, and I'll turn these off.

[End of morning interview]

[Begin afternoon interview]

Dewey Livingston: It is afternoon now on March 9th, talking with Sue Estey and Don and Elaine Dvorak. We'd like to continue and ask about the practice dives that you made as part of this expedition series: what was required of you, where did you go, things like that.

Don Dvorak:

As part of preparing to dive on Cordell Bank, we needed to do practice dives. They could be done on your own or it could be done as a group. One of the first dives I remember was not at the ocean but it was at Marine World Africa USA in Belmont. We got to dive and went into the tanks with the fish. We would swim around in the tank and we would look out at the people looking at us. But that was a real treat. I don't think I could have done it any other way except through the expedition to dive in their tanks.

But we were trying out new equipment. We didn't need to do deep dives for new equipment; we were trying out communications underwater, what they called hydrophones between divers and the surface. At that time the technology was very new. We needed to trail about a six-foot wire behind us that was on a buoy, a little flotation device. And the systems worked but it was very cumbersome with this thing trailing behind you. It was more overhead to where you need special masks with the microphone in the regulator. So we determined that wasn't a good option to dive on Cordell Bank.

And other places we'd practice at were Monastery. I think two months earlier they dove in Monastery. The interesting thing about Monastery is it's a beach dive, and of course we don't do beach dives to get to Cordell Bank. It's a long swim for one thing, but it gives us the opportunity to evaluate the divers that want to be part of the expedition. You can see how well they can operate with their twin tanks and octopus regulator. You have to have a certain amount of strength and be able to handle this equipment. And it's even a little more complicated on sand. And we did see that some people's enthusiasm was a little higher than their ability and this is what we need to know. We just had to politely say, "I'm sorry, this don't quite meet our requirements."

We also dove the Farallon Islands. If I knew then what I know about the Farallones now I might have opted out. I didn't realize it was the place where the seals pulled out during breeding season, a lot of little pups around. And that's shark food, and I could be mistaken for shark food. However I don't remember the date of the dive so we might have been diving there off season. We had the opportunity to dive there and collect samples, I think we had a permit to collect samples. And of particular interest to me – was that the North Farallones where the caves were?

Sue Estey: My dive log has May 1990, North Farallones, so it was well after all the Cordell Bank dives I'd done.

Don Dvorak: I see. I do remember diving there and we found a horizontal cave. It was shallow, maybe about six feet, eight feet or ten feet, but we all explored, went in there. And as you went in it got narrower and narrower. But what was unusual is, when you went in there and the further back you get the louder the surf noise became. And it became so loud that it was uncomfortable on your ears, at least on this dive.

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So I never ventured too far back because it was just too uncomfortable. But there is an anemone, a large anemone. I think it's called *Anthopleura*, it's an anemone that often lives in sand or hard substrate and it could be six to twelve inches across. And they're intertidal, in shallow water. They do get a lot of sunlight and they are green from the algae that grows in the tentacles. I was so used to seeing *Anthopleura* as green; in the caves I saw an anemone I haven't seen before, same size as *Anthopleura* but the tentacles were almost clear luminescent and they were white with a little purple on it and I says, "Wow, what a pretty anemone." I did manage to take pictures of it, says, "I've seen something new."

Later on I found out it is *Anthopleura* but since there is no sunlight the algae doesn't grow in it so it keeps that whitish clear picture to it. That was an interesting part of diving the Farallones, besides the potential of the sharks, which I didn't know about.

Dewey Livingston: Sue, did you have anything to say about practice dives?

Sue Estey: First about the Farallones. I remember going in and it looked like that was an arch, just an arched rock kind of thing and I went to swim through that, but then I saw light kind of in a different direction so I went that way towards the light. I was turned around, I did not really understand at first that there were the arch and this tunnel, but I saw the light, I went to the light, figuring I was going out, and I got further in and it got rougher, kind of more surge and gooseneck barnacles were growing towards the other end, and then this gray shape kind of suddenly appeared out of the green water and, oh my God. But I was quite relieved to discover it was really a seal, not a great white shark. Once I got to the far end and realized I'm heading towards the open ocean because there was a lot more movement

in the water I turned around, went out back the other way. But I have pictures of those white and pink anemones too, and it's pretty neat.

But practice dives, the ones that I remember mostly they were aimed at getting deep but close to shore so we could get assistance if we needed it. So they would be either at Monastery or Point Lobos where the marine canyon, the Monterey Canyon comes in close so you can get deep pretty quickly. A good way to remind yourself what narcosis feels like and still be able to get back to dry land pretty fast.

But there was also one, I think Lee Tepley had like a tripod, with a camera. The idea was to put a tripod down and take time lapse pictures at Cordell Bank. So we were trying it out I think at the Monterey Breakwater, so that was a more shallow practice dive, trying out equipment. I don't think we ever used it.

Don Dvorak:

Right. There was quite a bit of trying out new equipment. What Sue is referring to is Dr. Lee Tepley. He's kind of a pioneer in underwater filming. He developed an A-frame, two A-frames connected by horizontal bars. On those bars he mounts a time-lapse camera. In those days things weren't miniature; they were big. And it took one Zodiac to haul this apparatus out off of the breakwater, and we deployed it in shallow water, 30 to 40 feet. I think it operated but just the logistics of moving it was not feasible to take it to Cordell Bank.

So that's one thing we proved that we could not use. And there were other ideas we had in the beginning.

Sue Estey:

Bang sticks, remember those?

Don Dvorak:

Well, we thought of everything possible for every scenario that might happen. But again, there was the concern of sharks. So one of the techniques that we thought of to keep the sharks away is to carry shark billies, just a three or four-foot conduit with a lanyard on it and the other end maybe a little sharp point, or not too sharp.

0:10:07

The idea was if a shark came up to you and was a little too curious you can push him away. But most likely if you saw a shark it was too late, if he was interested in you. We carried those in the beginning and decided not a good idea – too much overhead.

Another safety feature that we thought in the beginning would be good to have is each diver would carry, in a waterproof container, maybe PVC, taped to the back of his doubles would be a marine safety smoke flare, or what they called a flare or smoke. If you came up and you were downstream and it was foggy well you'd have some means of attracting attention. But again it was too much overhead and it wasn't worth carrying. We also learned that we wouldn't be diving in such situations, or we would minimize the chance of losing a diver downstream.

We also experimented with construction helmets with the lamps on top so we could see our way around. But we learned the ambient light was bright enough you didn't need any artificial light, so we did away with those. So we gradually determined what was good and what was not and just minimized the amount of equipment or effort needed to prepare for our dive.

Dewey Livingston: Were the practice dives required by Dr. Schmieder?

Sue Estey: I think so, yeah.

Don Dvorak: Yes, they were absolutely required. In the beginning we dove as a group on practice dives, whether it was a shallow one or Monastery. Every diver had to go deep to experience the effects of narcosis and to learn how to deal with it. As the expedition moved on and we got to some core members it was up to the members to do their own practice dives. Often we would go out to Monastery or Point Lobos – outside of Point Lobos you can get quite deep and 150 feet was quite easy outside of Point Lobos. I did a couple practice dives there but usually Bob required two deep dives, except for maybe the Sacto team.

Sue Estey: They needed five, right?

Don Dvorak: Yeah, we weren't sure about them. *[Laughter]* But the Sacto team people mostly operated out of dive shops. Some were instructors so they were very, very competent people.

Jennifer Stock: Since you both dove in many places in California I'm curious if you saw any habitats that are like Cordell Bank. At any places you may have dove,

either Sonoma Coast or Monastery but, is there anything that's similar to what you saw at Cordell Bank?

Susan Estey: I think that the Pinnacles off of Carmel are a little bit like it. They're not quite as luxuriant but they're more in the ocean water and away from a river mouth so it's more clear and you've got more hydrocoral in it, that kind of thing. Maybe Farnsworth Bank down by Catalina but not along the shores of Sonoma for sure.

Jennifer Stock: How deep are those Pinnacles off of Carmel?

Sue Estey: I think they come within maybe 30 or 40 feet of the surface and drop down to 100 or more, so not really the same but they have some similar communities.

Don Dvorak: Cordell Bank, sitting right there on the edge of the Continental Shelf, is just washed with nutrient rich water, it is a special place and I think it'd be very very hard to find a place like it. As Sue mentioned the Pinnacles is a place where you see a lot of hydrocoral.

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Sue Estey: And that's fairly close to the Monterey Trench too, so it's got deep water nearby.

Don Dvorak: Sure, you might get the upwelling. Another place is Point Sur pinnacle. It's quite deep and it's offshore. It differs a little bit from Cordell Bank that the pinnacle there has I think more hydrocoral and more branching hydrocoral there. It's almost as if the water was a little clearer but I'm not sure of that. And Sue mentioned Farnsworth Bank off of Santa Catalina; that bank is fairly deep, maybe 110 feet I think. But that was my first introduction to pinnacle diving and it did have quite a bit of hydrocoral. But nothing can compare to Cordell Bank.

Dewey Livingston: Did you observe damage from fishing or dumping at Cordell Bank?

Don Dvorak: The only thing that suggested that fishing was conducted out there I might find a lead weight. I think I did see a lead weight, I may have photographed it. As far as broken items that might be what we did collecting. I didn't see mass damage, like somebody trawled across it, or I didn't see any nets on the bank, but there were a few pieces of broken hydrocoral and that could have been our collateral damage.

Dewey Livingston: I'll talk a little about photography. Sue, could you start by telling me a little more about your approach to photography down there, getting prepared, the kind of equipment you used and what you might have learned through the various dives? And I'll be asking you the same thing, Don.

Sue Estey: My equipment was about as simple as it could possibly be. I had a Nikonos II camera and this has no electronics, just O-rings to keep the insides dry most of the time. I think I used Kodachrome most of the time for film. I had an Oceanic strobe, a big blue thing like that (hands show shape of cylinder about 8" long and 5" across) to replace the strobe that came with the used camera. It came with a little flash in a Plexiglas box and it occasionally flashed whether or not I wanted it to, usually not when I wanted it to.

But the Oceanic strobe – I remember kind of cringing at the cost of it. But it was like, "Well, there's no other way I'm going to get the pictures." And a lot of what I did was macro pictures with extension tubes and a framer, or sometimes I went down with – I found some notes of going down with a 28 millimeter lens instead. But usually more macro photography is what I did.

Dewey Livingston: With the extension tube you're setting that up of course before you go down so you know –

Sue Estey: You pick what you're going to do. It could be only like an inch or two across possibly. Some of them were bigger; I would have to look at the photographs I got to figure out which ones I was using.

Dewey Livingston: So it wasn't adjustable much beyond just maybe an inch or so worth of depth of field?

Sue Estey: No not an inch.

Dewey Livingston: Not even an inch?

Sue Estey: I don't think so.

Dewey Livingston: So you were really down there, looking through a microscope?

Sue Estey: Nose to the ground, yes.

Dewey Livingston: Do you think that was more taxing than if you were just taking pictures from three, five feet away?

Sue Estey: Not really, you just see different things. And for me one of the things I loved about taking macro pictures is, you come home and get the slides developed and project them, then you see all these things that you couldn't see at all because they were really tiny. But they show up when you blow the pictures up like that. I really liked that aspect of it.

Dewey Livingston: Would you define that as your specialty within the team that you took the macro pictures?

Sue Estey: I guess I'd probably have to say that, yes. Other people did too, I'm sure, but that's most of what I took, and the topside pictures.

Dewey Livingston: Then tell me about the topside pictures?

Sue Estey: Well I took a lot of pictures on the boat, of people and what we were doing and the compressor and dumping people in the water and the Zodiac, throwing over the anchor. We had anchors but – who made those? They were rebar welded together, right? It wasn't like a regular bought anchor but they were made so that they could grab onto something on the bottom. So then if we did lose one it wasn't a huge expense.

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Don Dvorak: Could I respond to that? In the early expeditions we noted that the anchor dragged off the top of the pinnacle. And this became a problem. So Bob came to me and said, "Would you make an anchor that would catch and hold on the pinnacle?" We brainstormed a little bit, thought about it. We thought we would make one out of rebar.

So I went to a friend of mine who's very good at arc welding and he had an oxyacetylene torch. We went to him and talked about welding up something. So he came up with an idea of finding a pipe about 2-1/2 to 3 feet long, about four inches in diameter. Then we would bend rebar in kind of a grappling hook shape.

I went down to a local scrap metal yard and I found the pipe I needed and I just went to the local hardware store and bought some rebar. So we took one piece of rebar and formed a shape that we thought would be appropriate, kind of a J shape. We used that for a pattern to make four more. And we welded those four to the pipe on one end and then we welded another hook-like attachment to the other end so we can attach a clip to it.

It turned out that worked very, very well. We used that type of anchor, maybe the same one through all the rest of the expeditions. Again, that's part of the evolution and developing equipment for your needs. I still have one rebar template I keep for a keepsake.

Dewey Livingston: Sue, did your Nikonos have an automatic exposure system or you're dealing with just setting your strobe – how did you deal with exposure?

Sue Estey: That Nikonos model has nothing automatic about it, period. It doesn't even advance the film an equal amount each time. So frames are sort of randomly spaced. But when you're doing macro photography once you get an exposure that works it has to do with how far the strobe is from the subject basically and what f stop you'd pick. Usually you pick a high f stop for the best depth of field, it's still going to be pretty shallow and the strobe blasts away and when you get it balanced right you get decent pictures. So that's what it was.

Dewey Livingston: Did you do practice photography just like you did practice dives?

Sue Estey: I took pictures usually when I went diving so I guess you could say that.

Dewey Livingston: So you already felt confident?

Sue Estey: No, not necessarily but more often than not something came out.

Jennifer Stock: What percentage do you think were photos that were good? Bad question for someone who spent money on this film.

Sue Estey: So one good thing about these expeditions was that it didn't have to be a lovely composition, it was really just documenting what's there. So you'd go down and you'd take pictures and you get an idea of what's there. So

if it happens to be attractive looking as well that's a bonus but really it wasn't about composition, from my point of view anyway.

Jennifer Stock: Did you realize at the time the value of the photos and specimens in terms of what those would mean in the long run when you were doing the diving?

Sue Estey: When you think about taking it as a place that we were exploring that had not, except maybe the Navy, been explored before, absolutely. The photographs in particular, since each of us was down there each dive maybe 15 minutes, and busy looking at gauges and cameras and buddies and line and depth – there's a lot of stuff going on.

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So the photographs really afforded us a view of what it actually looked like when you could just look at the pictures and not have to look at all that other stuff at the same time, so really valuable. And the photographs were good also because they show the animals down there in situ where they live and then you can take the specimens and kind of fit them into where you must have seen them because there it is in the picture. So it was a really good combination.

Jennifer Stock: After diving and you had your film developed would the team gather together to see these images all together on a big screen?

Sue Estey: We must have done.

Don Dvorak: I think we had follow-up parties for the end of the year's expedition. We'd show our pictures and tell our sea stories, of course.

Sue Estey: And of course we had sessions for making dupes of the slides.

Dewey Livingston: Do you know where the film was sent for making dupes, to Kodak or a specialty lab?

Sue Estey: No we did it ourselves.

Dewey Livingston: Oh you made the dupes yourselves, copy cameras?

Sue Estey: That's what I remember – Bill Kruse was involved, I'm pretty sure.

Don Dvorak: I don't remember specifically who did the dupes; I thought Bob might have done some towards the end. But then we might have done it earlier.

Dewey Livingston: Sue one more thing: on the topside you were taking photographs and those were duplicated too?

Sue Estey: Not so much.

Dewey Livingston: So those are your own photos? Did you use a different camera up above?

Sue Estey: Absolutely. I think at the time I had a Fuji camera, regular SLR.

Dewey Livingston: Is there anything else you have to comment about your photography, specific whether technical or aesthetic?

Sue Estey: Well in many ways I felt personally that the topside pictures were more interesting than the bottomside pictures, but that's partly because I thought the way the team worked together was really amazing. So getting that into a camera really meant something to me.

Dewey Livingston: Don, how about you go through this similar idea of how you approached photography technically, and as an artist too I think – to me a photographer is an artist as well.

Don Dvorak: Prior to Cordell Bank I was very much involved in underwater photography. That was my main major reason for diving was just to capture the beautiful images on your California coast. People say, "It's cold there, why do you go diving?" But a lot of people don't realize how pretty it is in our waters. The amount of color is just fascinating. And you can take pictures of things that don't move; you don't have to go chasing a fish tail to get a picture. You get a beautiful picture of a nudibranch, something that small, or you can take a picture of kelp fronds. You can work with composition on something like that.

So I already had pretty good knowledge of underwater photography so I thought that would lend itself real well with the objectives of the expedition. Before the expedition I was using a two-camera bracket. Again, you can shoot up thirty-six pictures in first five minutes if you're fast. But also I wanted two different lenses so I can capture and get a different size. I started with the macro, too, like Sue used and then a

close-up, but for the expedition I changed to the close-up to kind of a landscape setup. But again, as Sue was expressing, you have to have everything preset. You have to know what's the right exposure for the distance you're going to shoot. And you just stay at that distance. You don't change that distance. That's going to change your exposure if you do. And everything is preset because the narcosis is just going to make you forget things or turn the dial wrong. So that worked out very, very well for us.

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Sue Estey:

What kind of film were you using?

Don Dvorak:

Yes, thank you. I used Kodachrome 64. That was a very good film for the grain size. 64 is not a very high speed film so that was pretty good. And when you're using slide film you've got to be very precise on your exposure; there's very little latitude, not like print film. And it's much easier to view slides than it is prints, and it's easier to make duplicates. Later on I added the third camera, as Bob suggested, to do landscape pictures. Three cameras and two flashes, wasn't too bad to handle.

Dewey Livingston:

I was going to ask about the three cameras – would you tend to shoot off all the film in one camera and then go to the next or if you were interspersed between them? How would you keep track of number of exposures, or did you need to even worry about that? You had a limited amount of time.

Don Dvorak:

At that depth on the Nikonos you didn't try to count your frames; you just looked at something interesting and you took its picture and you moved on to the next one. There's no time just to sit there and think about it, "How do I want to hold my camera, up or down? Do I want to do portrait?" Just go up, click, back off, put the other camera, click, and move on to the next subject. If you see something interesting you go over there and take the picture.

So there was not an organized sequence; you just went there, looked and took the picture as you thought was interesting.

Another reason for turning to three cameras: there's always a chance that you will flood a camera, and it has happened. So if you flood a camera you still have something to bring back. And yes, I have flooded cameras and it got to be kind of a joke amongst them, "Oh there goes Dvorak, I

don't know how many cameras is he gonna flood today?" But that was important to have backups, so to speak.

Dewey Livingston: How do you flood a camera? Isn't it the camera's deal or did you not seal it correctly? What would be the issue there?

Don Dvorak: Well you had to be very careful when you assemble a camera, you properly grease the O-rings and you've got to make sure there's not a little bit of dust, or perhaps an O-ring can be worn out. Just can't be sloppy; you've got to take your time. But again, on the boat, moving up and down you're a little fatigued and you might miss a little bit of grease there or something. But for the most part the three cameras worked out very nicely.

Dewey Livingston: Nikonos, that's an underwater camera, right? So you're not talking about having it in a plexi box or anything. So even on those commercial cameras you had to maintain them that way, the O-rings and things?

Don Dvorak: Right. And as Sue said, these are strictly manually operated cameras. You have to choose the F-stop; the camera doesn't choose it for you. And you have to set the shutter speed, which is pretty simple. Usually 1/60th of a second.

Sue Estey: And take the lens cap off, Don. Remember that?

Don Dvorak: You didn't have to mention that, Sue. This was on Easter Island, the best dive ever. And I went through the whole dive, "Oh wonderful picture, wonderful picture, wonderful picture. This is going to be great." I got back on the inflatable and the lens cap was on. Did I feel like the village idiot.

One of the things is – because we all had jobs and we weren't making a whole lot of money, the camera equipment was expensive. And we had to improvise when we could. I used two plastic housings to house my strobes. One of the plastic housings I built out of Plexiglas and another one was a commercial housing with a strobe. They were land strobes but in a plastic box. And they did their job.

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But people like Bill Kruse, he's got these big Subsea strobes – another showoff. No, but that set up I can't express how important it was he

brought back such good pictures with his setup. We kind of like to jab at each other a little bit.

Dewey Livingston: Is there anything else, Sue, that you'd want to tell about photography, taking photos down there that comes to mind? Then we'll let Elaine get something to say.

Elaine Dvorak: I have a comment about it. I remember him taking the camera and doing a lot of tests beforehand where he'd take it and he'd go somewhere and be underwater, maybe not very deep. But measuring distance and trying different strobes and different films and different apertures, then bringing back the test results so that when he went to the depth on the actual dives that he had a proven setting.

Dewey Livingston: Is there a way to test without being underwater for instance?

Don Dvorak: Not really because the light falloff underwater is very rapid. There may be some formulas you can work with but even in a swimming pool you can't do that.

I have an interesting story: this was one of the trips out of Alameda, I believe, on the *Pisces II*. Elaine and I arrived at the *Pisces II* with all our dive gear, camera gear and started loading it on board. This was late in the evening and I realized I'd forgotten my camera bracket. So Elaine and I went back home, picked up my bracket, and she didn't come on the boat with us but I went on the boat and then we left to go out the Golden Gate.

I didn't realize I left the camera bracket in the car. After we were gone she went back to the car, she realized the bracket was there. And so now she's trying to figure out how is she going to get the bracket to me when we are underway?

It was fortunate that she was part of the Coast Guard Auxiliary. So she drove all the way over to Sausalito, to the Coast Guard station there, I guess she knew people there. So they tried to hail the *Cordell Explorer* on the marine band, but apparently the radio wasn't on and nobody was listening so we couldn't come in to get the bracket. So she was instrumental in getting one of the Coast Guard people to take their little boat out to the *Cordell Explorer* and bring me the bracket.

Elaine Dvorak: Actually I rode out with them. And he still hadn't missed it. It would have been a disaster if he'd gone out there without it. So we rode up in this big Coast Guard inflatable and handed up the bracket.

Don Dvorak: "Oh we're in trouble; here comes the police."

Dewey Livingston: Wonder what they put in their log after that, how they justified the trip.

Sue Estey: "Training."

Don Dvorak: "Absent minded skipper." But I'm glad she had her connections then.

Dewey Livingston: So Elaine, you haven't had an opportunity to say much for a while so first of all, didn't you meet Sue before you met Don?

Elaine Dvorak: Yes.

Dewey Livingston: Tell us how you two met.

Elaine Dvorak: Well, Sue and I both sailed in the Oceanic Society Crew Group. The Oceanic Society was a much bigger organization in the Bay Area. They had a Bay Area chapter at that time and people who were interested in sailing joined the crew group and there were people with boats and people without boats and we had events and we would go out sailing on a weekend of something and people would sail out of different harbors and we would meet someplace and raft together and have a barbecue or something and then sail back to the harbors – and we worked on people's boats when they hauled out and just generally was a good, sociable group of people. We had monthly meetings at Fort Mason. So, I met Sue through that.

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We were out on Mary Buckman's boat, it was the Cheoy Lee working on sanding and varnishing and stuff. Sue was telling me about the Cordell Expeditions and there was a Christmas party coming up, or a Thanksgiving party or something. It was in November of '85. She said, "Well, she got an invitation it said, 'Come bring a friend.'" So she said, "Why don't you come?" I did and that's how I got started with the Cordell Expeditions.

The party was at Bob's house and Sue suggested that I get there before it got dark because it's not easy to find the place in the dark if you didn't know. So I got there a little early, there were only a few people there at the party. I remember – of course there are all these people who know each other and they're all standing around together and telling stories and stuff. And I found somebody who was sitting kind of over to the side and sat down and started chatting with him. He was telling me who people were and all that and that was kind of fun. So that's how I met the people at the Cordell Expeditions.

Dewey Livingston: And they invited you to join?

Elaine Dvorak: Well then Bob bought the boat. I had talked to him and said, "No, I'm not much of a diver. I'm certified but I've worked on boats a lot." So when he bought a boat he called me and said, "Come and see my new boat." So I did and helped him take it up to Sacramento. I mentioned that before, and got involved with working on the work parties.

So I didn't meet Don until at least six months later. That was when the boat was hauled out in Sausalito was the first time I met Don and he and Sue came together to the work party and that was the first I saw him. I didn't actually start dating him for almost two years I think. But I kind of liked him.

Dewey Livingston: So tell us the story about going out on your first trips with them and what your role was.

Elaine Dvorak: Actually the first year I went out – like I said, Bob hadn't had a boat; he'd never owned a boat before and so when he'd gone out with the *Pisces* and the other boats that they took out the skipper said, "We want to go here," and the skipper of the boat did the navigating. I had been with the Coast Guard auxiliary and I'd also taken some navigation classes at University of California. So I knew how to do dead reckoning and I knew how to use the LORAN and I knew how to look at a chart and figure out where you wanted to go.

So he asked me the first year, he asked me if I would come along and help with the navigation. That was pretty nice. So I did. Then the next year he called me up and he said, "We're not going to need you to navigate, Elaine," and it's like, "Aw, no." And he says, "But I would like you to

come along, provision the boat and cook.” I’m thinking, “Wait a minute, I’m getting demoted from navigator to cook.” What I realized was he was inviting me to stay in the expeditions and whatever way I was needed that was fine with me. And I did still get to do some navigating and drive the boat and stuff.

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Then what I would do is – I was working four days a week, so I would take off one day – I took off Thursday, Friday, Saturday and Sunday, and on Thursday I would go to Costco and to some grocery store – actually I went to a grocery store in Seaside because when I crossed the border of Monterey to Seaside and saw a grocery store there I said, “You know, I’ll bet you that’s going to be a lot cheaper,” and it was. They had bulk things, you could buy ten chicken thighs in a package. So I would stock the boat – like ice, we had ice boxes which would be up on the flying bridge. I would pack things, and bought everything from candy bars and toilet paper and made sure we have pencils and pads of paper and just generally responsible for everything that was going to be needed on the boat, and Bob would reimburse me.

Dewey Livingston: Was it your call what was needed or were you provided lists?

Elaine Dvorak: Pretty much I would go through the boat and look around and see what was needed and as far as feeding them was concerned I think on the earlier expeditions everybody just brought their own food; they didn’t have anybody cooking for them. I don’t think that the guys necessarily had food when they needed it that way. So it was nice to have somebody to cook.

It was some funny times. Around 10:00 in the morning guys would come into the cabin and they’d just be sort of pacing around and looking. I’d say, “What are you looking for?” “I don’t know.” And what I realized was they were looking for the roach coach, the truck that drives up and goes, “Do da do do, da doo,” and the guys go out and buy their midmorning snacks. That’s what they were looking for was a midmorning snack.

So I started putting out maybe a tray of brownies. Then I would just get on the radio and say, “There’s snacks in the cabin here for anybody who’s hungry,” and I discovered there were some people who got seasick. I found a formula that worked. I tried making eggs and bacon for breakfast and people would say, “Oh please, don’t cook bacon, it makes me

seasick.” So I found that Cheerios and bananas and milk worked good for breakfast, and it’s just three days and they would eat it.

Then I tried all different kinds of cold cuts and different kinds of bread and found that sourdough bread and turkey sandwiches worked for lunch, and I would slice onions and tomatoes and have plenty of lettuce and mustard and mayonnaise and that worked fine. So breakfast and lunch were the same every day.

Then I would do barbecued chicken one night, I would do pork chops one night and then the last night would be running in, probably. So I might buy the ribs in the packages. And we had a microwave oven. Bob didn’t believe in having propane gear on board. It was a diesel engine but not gasoline. You don’t want to mix. But he had an experience years before where somebody’d gotten burned – because the propane settles, it doesn’t float away. So we had a microwave, which would only run when the generator was running, and we had barbecue, we had some kind of a stove that we used, and I would use that outside on the deck.

But I might cook chili – I also had to keep supplies on hand in case we were stuck a day, or in case it was too rough to cook what I had planned, so I would always have something like a big can of chili and a couple of cans of sliced tomatoes and stuff that I could just sort of pour together and heat up. I actually won a chili cook-off with my recipe once where everything was in cans.

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Actually I got second place I think which was appropriate because I was a newcomer; I didn’t want to win it. I was very glad to get second place. So I would try to get everything all stowed and put away. Also I would buy candy bars – Snicker bars were the most popular. I would separate the candy into three packages and I would hide two of them because if I didn’t the Snickers would be all gone at the end of the first day. Then they’d want to know where are the Snickers. I also bought cocoa which when the guys came out of the water if they wanted to have cocoa or those noodle drinks, they could have those. Some people were really glad; some people didn’t want to do that, but that’s fine. And the candy bars of course, help get their energy back up when they came out cold.

Sometimes I’d do corn on the cob. I’d start it in the microwave because that kind of cooks the middle first and then I’d wrap them in tinfoil and

put them on the barbecue to cook the rest of the way. It was a challenge to find what people would eat.

And it's different – when we went to Rocas Alijos we went on a charter boat and they normally took out fishermen. I thought about calling them and saying that they don't want anything that gives them gas because they're wearing dry suits and that can mess with the buoyance, not to mention the smell. And they don't eat like fishermen. I thought about calling the crew on the qualifier and saying, "I found out that Cheerios and bananas works for breakfast every day, don't bother with anything else," but I thought, "Of course they know what they're doing." But they ran out of cereal after about a third of the trip. And then they ran out of eggs not long after that and we had to get some extra supplies from one of the other boats that was down there because we were out for about ten days, week or ten days anyway. Yeah, it was fun, it was a challenge.

Dewey Livingston: Was alcohol allowed on board on the *Cordell Explorer*?

Elaine Dvorak: We had beer. They were very fussy about the beer too. Couldn't buy cheap beer.

Sue Estey: Coors Lite, right?

Elaine Dvorak: I don't remember if it was Bud but I think I might have bought Miller one time and got in big trouble. But divers, for the most part, don't drink much alcohol besides a little beer because anything that stays in your system the next day can – and they get high on nitrox, you know, nitrous – they don't need to get stoned or drink much alcohol. Some of the guys drank some beer but mostly not much.

Dewey Livingston: Did you have other responsibilities on board?

Elaine Dvorak: Well, I was kind of hostess. I needed to make sure if there were new people that they knew where things were and how to operate the head and stuff like that. I loved to drive the boat, especially when the waves are behind you and you're surfing on the waves. I was pretty good at that because the boat can really wobble along if you're doing that. You've got to keep steering and it's just a lot of fun with the *Cordell Explorer*, she's got a big flat bottom and it picks up and it just slide down the wave. Then

the water comes way down and then it goes way up. Surfing the waves – the trip down to Monterey later, that was so much fun.

Dewey Livingston: Who tended to steer the boat? Was Bob the skipper?

Elaine Dvorak: Bob was the skipper and he was the best at it. And when the weather was rough or something like that he would do it. I steered the boat a lot when the weather was nice and when we were going downwind, but when we were heading into the waves he was in charge of that because that's the toughest.

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Don Dvorak: Bob felt confident with his crew that he would allow other people at the helm or tiller, wheel. And he let me, "Take this compass heading and take us home." One time I was at the wheel and I saw a sea turtle go by. So I turned the *Cordell Explorer* around to see if I could see it and Bob was up there in no time, said, "We changed course." But he had a lot of confidence in his people.

Elaine Dvorak: Yeah, one time I saw a big leatherback, must have been four feet long, great big leatherback. And one time we were coming across Monterey Canyon, coming back and the place was just thick with huge, green jellyfish. I mean there were thousands of them all around. The bottom drops off of the depth sounder when you go across the Monterey Canyon. I guess the depth sounder only goes to 300 feet or something like that, or did in those days. The fish finders and the navigation was much more primitive than it is now.

Dewey Livingston: Who took care of medical issues aboard the *Explorer*?

Don Dvorak: We always tried to have some person on board that have some medical experience. Dannie Baxter I think was a nurse of some type. I don't know what her specialty was but she was there, and in the beginning we were taking temperatures, get our core temperatures and so forth because hypothermia was always a concern. It actually turns out that we didn't have to do that but maybe a paramedic or even a foot doctor in some cases, somebody that had some interest or knowledge.

Jennifer Stock: Speaking of cold, did everybody dive without gloves or did some people dive with gloves?

Don Dvorak: I know one person who dove without gloves because I've seen a picture of him, could have been Harry, but it was also Bill Kruse. I can't imagine diving without gloves. But for the most part everybody was covered head to toe.

Jennifer Stock: Was it hard to take photos without gloves on?

Don Dvorak: Actually it wasn't. The shutter release on a Nikonos is rather large, not just a little button but a lever. You just get your finger on there you could push it.

Jennifer Stock: Since you dove there a couple years based on your experiences what did you assume the rest of the bank looked like and did you notice any changes year to year in terms of the abundance of species or absence? So, changes you may have seen over the years and what were your assumptions of what the rest of the bank looked like since you were diving such a small part of it?

Don Dvorak: I didn't see any changes from year to year. Often we were diving at different sites year to year so we saw changes from the various sites. On the higher pinnacles they were mostly covered with the barnacles. There are a lot of barnacles out there and you can see them filtering the water. They were interesting but they weren't very colorful, but we did document them. And if you move down then you moved into the sponges, the hydrocoral and the garveia and the tunicates. That's where most of the color was, and corynactis, certainly.

Some of the steeper pinnacles, if you went down, the ecology changed. It was as if you were in the mountains and you were going up higher and higher and all of a sudden there's the timberline; above that there's no timber. The same on Cordell Bank: you go down to a certain depth and then the ecology changes and it's much, much more sparse, just simple solitary organisms on the side. That was very apparent to me in a couple dives. Of course you didn't see that on mostly the ridges they were somewhat flat.

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Jennifer Stock: How about you, Sue?

Sue Estey: I'm not sure I could tell you which sites I dove on which times. To me I just remember this total jumble of things growing on top of each other.

Jennifer Stock: Just from our experiences, like one year we were out there and we saw just tons and tons of juvenile rockfish and then the next year none. I'm just curious do you have any memories of those juvenile rockfish being abundant or not abundant?

Don Dvorak: I did notice sometimes yes, there were a lot of them: "Shoo, go away, I want to take this picture." That's their environment, so you're working in their environment. When you take a picture and the flash goes off if the juvenile's too close it just reflects back and you get a bright spot. It spoils the picture but that's not important, we're not there to take these really artistic pictures, we're just bringing back a representative set of Cordell Bank.

And sometimes you would see the larger rockfish and fewer juveniles but they were always present, always there. I didn't see too many ling cod, but I did see one. But I did notice the lack of nudibranchs. Diving the shallow waters along the coast you see all kinds of nudibranchs, lots of them, different colors. I do not recall seeing a nudibranch but other divers have captured pictures of them. So that was an interesting observation on my part.

Jennifer Stock: How about surface wildlife? Were there any memorable wildlife encounters at the surface? Any whales come up around you while you're diving?

Don Dvorak: I do recall one of our earlier days, say on a Friday we were out doing some surveying and on that particular day, without exaggerating, there must have been 50 to 100 shark fins in the water, just a lot of them. But they were blue sharks. Blue sharks usually are not a big concern but there were plenty of them. And we just continued doing our surveying. I believe the next day we did go out and dive but the blue sharks weren't there that day. I never seen a shark under water, and it never was a concern, though I usually dive with another partner or two other partners. So when you have three that improves your chances of surviving. But I was more concerned with the depth and narcosis.

Jennifer Stock: Do you have any memories, in terms of surface wildlife, birds or aggregations or feeding frenzies?

Sue Estey: Well, a couple years ago I went on one of the trips that you didn't go on out to Cordell Bank that was just an incredible accumulation of humpback whales and all kinds of birds and I don't remember that from our diving times.

Don Dvorak: I do recall another time that we were out on the bank and it was a fairly calm day. My interest was Cordell Bank, taking pictures. I did not have an interest of the animals above the water. But I do specifically remember one day out on the bank there were probably 1,000 birds on the water and they were not gulls, they were different. They were bigger and their beak was a bit different. I tried to take pictures and I didn't have a telephoto lens but to this day I do now know what those birds were, but they were different.

Jennifer Stock: They're probably shearwaters.

Don Dvorak: Bigger than gulls? Just wondering if they were albatross.

1:05:00

Jennifer Stock: They could be. Elaine, you had some memories, you have some notes here?

Elaine Dvorak: Yes. Doesn't say what day or where but yeah, I did try and write down – we would see auklets – in fact we anchored at the Farallones a couple of times and auklets nest there and they fly at night. And they would come and get on the boat because they would come to the light, but they couldn't get off the boat. So I would have to go kind of climb among the packs and the tanks and stuff and I would catch the auklets in my hands and release them off the boat as early in the morning as I could, before anybody else woke up. That was quite a neat experience: they're so warm and their little hearts are just beating like crazy. And of course the murres are out there and the shearwaters and sometimes we'd see phalaropes. Sometimes you'd see little flycatchers out there too and they'll come and land on the boat. That always amazed me.

But on the boat – there were flies on the boat so there was plenty for them to eat. That was another thing is, people would try and kill the flies on the transom, use a big board and smash as many flies as you could.

Sue Estey: The more flies you smashed the more flies were attracted to those smashed flies, so then you'd get more.

Jennifer Stock: Is that at the Farallones? The Farallon fly, yeah.

Dewey Livingston: Because we haven't necessarily covered your entire career, so to speak, with the Cordell dives I wonder if you could each just briefly summarize that, "Well I started in such and such, and my last dive, or experience there was such and such," giving a sense of maybe how many dives you might have done at Cordell Bank. And then we'll go on. Do you want to start with you two? Well first of all you met and you ended up getting married?

Don Dvorak: That's correct.

Dewey Livingston: So maybe that should lead into summarizing your career on Cordell Bank.

Don Dvorak: Well, I'm not quite sure where to start here. Maybe somebody else would like to start while I gather my thoughts.

Elaine Dvorak: Well, I'll tell you one thing: there were a couple of the guys that drank more than the others and there were some of them who bugged me a little bit because they would throw down their beer cans and they wouldn't help. There was a little macho, so there were a couple of guys that at one point I didn't get along with as well but I did later. When Bob was making up the crew list I said – and one of the wives wanted to also go on two of the expeditions to cook and I went on the other four – and so I said, "Well why don't you put these guys on that boat with Gail, and you might put some of those people on this boat with me," and Bob says, "These are scientific expeditions, Elaine; this is not a romantic cruise," or something like that.

But when I got out there I discovered, it's like, "Bob, what have you done? You've thrown me to the wolves. Here I am with 11 single guys or something – and me!"

1:10:00

But one of them was Don, and he looked really tired at the end of the day and we were looking for places to bed down. I did canvas work so I had made some shelters that we could tie over the engine room and up on the flying bridge and some people brought tents that they would just pitch on the back deck, but actually when the boat rolled the water would come up through the scuppers and so the deck would get wet. But I suggested that I

would rub his back if he would rub mine. *[Laughing]*. He thinks that's when I got my hooks in him.

Dewey Livingston: Were there other examples of a couple meeting during these expeditions?

Elaine Dvorak: Bob has some examples. I think there were more divorces than there were marriages because once people got into it they just got hooked on it and they didn't want to give it up even if it was hard on their spouse.

Dewey Livingston: So I won't put you on the spot any more about it unless you want. Then just to summarize, Elaine you went on Cordell Expeditions from approximately what year to what year, about how many?

Elaine Dvorak: I first met Bob and the Cordell Expeditions in the fall of '85, so there was just one more dive on the Cordell Bank after that. And that was at the end of '86 because we went down to Monterey that year. And then we came back for one last five-day session up on the Cordell Bank. So I was out there just that one time, then later we've been up there since then but that was all.

Dewey Livingston: Were you aware that was the last dive?

Elaine Dvorak: Yeah, because Bob said when Cordell Bank became a sanctuary he was going to call the expeditions over. And I don't think it actually became a sanctuary until '89, but '86 they had already turned in all the paperwork and that sort of thing, had the public hearings. Or maybe the public hearings were in '88. But anyway, it was in the bag.

But I had been out there before. I think, and I could be mistaken, that some things are more abundant now than they were then. And it might depend on the year and whether it's an El Niño or not because the El Niño makes the water warmer and it's harder on the birds to feed their chicks; they don't get the upwelling, I think. But I think the whales, for instance, have made quite a comeback between the 1980s and now, we didn't see as many whales. I don't know about shark populations. We still fish sharks and they still cut fins off of sharks and stuff like that. So I don't imagine shark populations are doing too really well. I hope they will do better. So there may be relative abundance, but I don't know as much about it probably as the people from the sanctuary do, but I think we see more whales out there now than we did then.

Dewey Livingston: Don, would you summarize your career from beginning to end, maybe giving an idea of how many dives you might have done. And if you have some notes and if you have anything else to add based on your notes that we haven't covered that would be fine.

Don Dvorak: Well, I feel that I'm extremely lucky that I was at the right place at the right time when Bob sent out a call for divers. I came on board in 1977, right from the beginning, and went through all these strategy meetings. And I feel that in some way I contributed to help steer the expeditions in the right direction, whether it was photography, what we wanted to do.

1:15:10

And despite missing the first dive in '78 and missing the dive in '79, I managed to get in 17 dives on the Bank in the following years. So that by far made up for the two first years that I missed diving.

I'd like to characterize the expedition as a bunch of people finding a window that looked at Cordell Bank, and our job was to open that window. The first two years that window opened very slowly and a very little bit. But it opened enough, enough information came out that it just piqued our curiosity. We wanted to do more. We wanted to improve our techniques because we didn't get enough the first two years. So we did, we improved our techniques. We got there easier, we'd find a place and that window opened a little bit more. And the next few years more information, more data came out.

By the mid-Eighties and '85 that window was almost all the way open. We know we can go there, we can bring back specimens by the bucketful. We can bring back pictures by the hundreds and thousands. And the window was open now, that now the public has an opportunity to see it. And we have enough information where we could go out and have presentations to the public, help bring Cordell Bank to public awareness. Besides the diving it was a real joy putting together presentations.

One of our biggest presentations was at the Cal Academy of Science, what did we use, 12 projectors?

Sue Estey: I was going to say eight but it could have been 12.

Don Dvorak: All synchronized with the film camera projecting there. Paul Hara was very good at multimedia production, so we were up all night trying to get this production together. And we got it together and we took it to the Cal Academy. Those were all really quite rewarding to our efforts.

Now that window is really open – I think it’s going to stay open, especially since Cordell Bank became a National Marine Sanctuary and people like yourself, Jennifer, and Dan Howard are still keeping Cordell Bank in the public eye. And you have your program for you to bring your students in and you bring teachers in, this is all going to help in keeping that window open. I’m glad that in some way I was a participant in opening that window.

Jennifer Stock: That’s well put. Thank you.

Dewey Livingston: Sue, would you like to summarize your career, so to speak, and if you have anything else on your notes to bring up.

Sue Estey: When I look at my diving experience, I got certified in 1975 and I got hooked up with Cordell Expeditions in 1979, so those expeditions really happened kind of early in my diving career and in many ways I was innocent when I had a wetsuit that had just a bottom and a jacket. It was not even a Farmer John. It’s amazing. But fortunately the dives were really short so I couldn’t get too cold. But during those expeditions I moved to a dry suit, during those expeditions I got a strobe that would actually flash on demand.

But later, after Cordell Bank I went on to Point Sur, I did Rocas Alijos, I did Easter Island. But I also got additional training, I got trained as a rescue diver, scientific diver, cave diver. It probably would have been better if I’d been a cave diver before I ever went to Cordell Bank because I would have learned a lot about equipment that would have been a safer way to go. But I didn’t know, it was really the beginning.

1:20:14

Sometimes, once in a very rare while someone contacts me about diving at Cordell Bank and could they go do it, and I always say we had a lot of advantages that they probably don’t have. We were really lucky to have Bob, as organized as he was. We had a lot of divers with way more experience than I had at the time. And we had a team that worked together.

And when I think about a diver going out to Cordell Bank and how maybe it would be, say six people out on a boat. You need to find the place, you need to find the ridge. They're very sharp pinnacles; it's not like a plateau at 120 feet, it's like a high point at 120 feet and then it drops off real fast. So I think that the organization that Bob developed really made it possible and I think it would be really tough for Joe Diver to go out there and jump in and hit a spot that they can actually get to and live. So I think we were really lucky to do it this way.

Dewey Livingston: That was incredible that they did this as you described, with their own equipment, everybody somewhat different, some more well-equipped than others, and you weren't crazy were you?

Sue Estey: I don't know about that. Some years I thought it was too crazy and I didn't go.

Don Dvorak: We weren't insane but we were crazy.

Dewey Livingston: I made a note here from way back: Don, you mentioned Dr. Hanna; is that somebody who had dived previous to these expeditions?

Don Dvorak: He didn't dive there. I think he was more interested in geology. I think he went out and did some grab samples.

Dewey Livingston: Mechanical.

Don Dvorak: Mechanical, maybe with something like a Peterson grab or some other mechanical means. But he did bring back some of the sediment.

Dewey Livingston: Now when you first dived did you think like Dr. Schmieder did that you were the first ones to be diving there? Or had that already been proven false?

Don Dvorak: Well I missed my chance to be on the first team. I was in the Grand Canyon – those guys were really envious of me.

Elaine Dvorak: Are you referring to the holes?

Dewey Livingston: Yes.

Sue Estey: I think we both went diving before they found the holes

Don Dvorak: Yeah, I just wasn't there. But my dive, again, was on the third year, and when I went down I didn't get down to the bottom for the first time and sit there and reflect, "I am here. I am here where few people have been." That didn't even cross my mind. My mind was pre-programmed: take pictures, watch your narcosis, stay alive, come back. And that was, again, the most important thing to me. Later on I had time to reflect, I've been there. Only a few divers have been there, and I had an opportunity that most don't have. But again, being the first was not the most important thing for me, it was my opportunity to help describe Cordell Bank.

Elaine Dvorak: I think when they found the holes it was a surprise, that obviously somebody had been there with some more advanced equipment that *Cordell Explorer* had. That was before *Cordell Explorer* even. And Bob went to the Navy something or other – he went somewhere and tried to find out about that and then that door closed. And they weren't saying anything.

1:24:55

But apparently it had something to do with submarines and being able to – they didn't want the Soviets to be able to hide a submarine out there. And so they had some kind of equipment that they had bored into the rocks there. That's the best we know. And I don't know what is known about that now, whether they've ever come clean and said, "Yeah, we did this." But that was a big surprise to find that. Evidently the Navy had been there.

Jennifer Stock: They probably weren't looking at it like you were, though.

Sue Estey: No, they probably had a more practical point of view.

Don Dvorak: National defense.

Dewey Livingston: Did any of you get involved with NOAA or the National Marine Sanctuaries – you already said that you knew that something was happening with getting a designation. Were any of you involved with that, whether it be going to hearings or –?

Sue Estey: I don't think I was.

Don Dvorak: No. We knew Bob was involved in the designation, and when it went up for nomination – I guess it went out for public input. I think I received a letter from Bob saying this is where it's at, public input. And I said to myself, "What an opportunity to express my needs for the Cordell Bank to become a sanctuary." And I had the opportunity to write the letter to NOAA. I thought it might carry a bit more weight being a person who has been there and I could describe it to them. So I said, "Yes, make it a sanctuary, use the larger boundary limits." And that letter is online. I went back and read it. I saw your letter, Sue. I saw Susan Dinsmore's letter. There were a few people from the expeditions that sent in their thoughts. That gave me kind of a nice warm fuzzy feeling that I can give firsthand input.

Jennifer Stock: Did you know at the time what becoming a national marine sanctuary meant?

Don Dvorak: I didn't give it much thought at the time. I was so consumed with this project at hand. But as the designation progressed through and to the point where it was designated, yeah, I finally realized the importance of Cordell Bank becoming a marine sanctuary. It is now protected, and it most likely will be a marine sanctuary forever.

Sue Estey: Not like the state parks.

Jennifer Stock: How about you Sue?

Dewey Livingston: Any involvement?

Sue Estey: Well, Don says I wrote a letter.

Jennifer Stock: I actually remember you wrote a letter. You did. Look in the designation document and there's letters in there.

Sue Estey: I remember going to a hearing but I think it was about offshore oil. I remember speaking at some kind of meeting like that. I don't think it was for the sanctuary.

Jennifer Stock: Similar time period?

Sue Estey: Yes.

Jennifer Stock: So there was interest at the time of offshore oil in this region?

Sue Estey: I think so, yes.

Elaine Dvorak: I have a copy of the letter Bob sent to us, some of those letters about the public hearing and the boundaries and offshore oil drilling and stuff like that. I don't want to make a lot of noise with this thing here but they're in this file.

Dewey Livingston: I think we're running low on time now so just a few kind of ending questions and I'll start with you Sue, if you will: how do these experiences of diving on Cordell Bank rate with all the other adventures you've had? You've dived a lot of really amazing places. Where does Cordell Bank stand?

1:29:53
Sue Estey: Cordell Bank is an amazing place to see but there are a lot of other places I'd go first because if you go to 150 feet you can't stay very long and I would, given a chance of picking where I want to go diving I'd go to Indonesia like I'm about to do right now because there's tons of stuff to see and it's not so deep and it's not so cold and, even though it's farther away, it's in many ways easier to get to, there's services, dive boats that actually go there routinely. So Cordell Bank is an amazing place but it wouldn't be my first top place to go.

Dewey Livingston: What do you want people to know about Cordell Bank, if you had a desire to make sure people appreciate it?

Sue Estey: That it is teeming with life, that it is out in remarkably clear water for California coast and – even on the top of the water it can be amazing but diving it's even more so.

Dewey Livingston: Do you have any feelings on the fact that you were part of this group that led to the designation of Cordell Bank?

Sue Estey: Sure, I mean I'm proud to have been a contributor to this. I'm glad I got to go, I'm really glad I got to meet the people, the other divers. For years I went diving with them at different places in the world, so it's been good.

Dewey Livingston: Don, how does this rate with your other adventures? Where does it stand in your heart?

Don Dvorak: Cordell Bank, having the opportunity to dive there, help describe it, is the number one high point in my life, excluding family. In 1984 I had the opportunity to carry the Olympic torch in the relays that were at Los Angeles. And prior to Cordell Bank that was my biggest, highest high, as it were. But then along came Cordell Bank, and that surpassed the torch run. That's always going to be a very fond place in my heart. It's a place that should not be forgotten. It should be kept in the limelight, keep the public aware of such a special place right off our coast, unlike any other, and you're doing a great job of that, Jenny.

Jennifer Stock: I was just going to ask you do you have any tips, either of you, to help with that, because it's a challenge.

Don Dvorak: Oh I bet it is.

Sue Estey: I think a glass bottom submarine sounds like fun.

[Crosstalk]

Don Dvorak: Could we get a ride in the submersible? *[Laughter]* But the Cordell Bank finally becoming marine sanctuary, all of our work culminated right into that one event, that process of turning Cordell Bank into a marine sanctuary. And I think in itself it's going to help preserve it. And the worry is can we maintain that interest in the sanctuary? It's going to take people, it's going to take contacting the right government offices to keep funding our sanctuary. And I hope it will continue in these hard times. But that as a marine sanctuary, that's my biggest reward.

Dewey Livingston: Any closing thoughts, Elaine?

Elaine Dvorak: Well the Cordell expeditions were certainly one of the high points in my life; I like big excitement and there's been a few things that I've really wanted to do – one of them was to get out on the ocean and I think that was the best way for me to do it that I could have imagined. And I've had some other exciting things happen in my life but this is definitely right up there with the best of them.

1:34:51

Of course we've had the Farallones National Marine Sanctuary so I did have some idea what the designation would mean, and of course the Monterey National Marine Sanctuary too, to protect this whole beautiful coast and to try and protect a breeding ground on the ocean we need a lot more work yet than has been done if we're going to keep on feeding the population of the planet without depleting the oceans and I think that what you're doing is really important and I just hope that people can be made aware – and the research that you're doing that we helped to start with that baseline information – I know that in some places where they have protected areas from fishing that the fish have come back. It gives me hope for the future.

Jennifer Stock: Thank you, that's wonderful.

Dewey Livingston: Any final comments or thoughts?

Don Dvorak: I don't know if I should say this. As I mentioned, it was important for the crew to have a sense of humor, and I had my little bit of sense of humor too. On one of the dives I brought down a little rubber alligator, about eight inches long, the kind of alligator that belongs in your tub to scare the kids. I took it down on the dive and I set it on top of some hydrocoral and I took a picture of it.

Jennifer Stock: I've seen that picture and I wondered what it was.

Don Dvorak: And "Bob, Bob, we have a new species here. I think it's an invasive species. We've got to be careful; we can't let this thing propagate!" But that was my input for our humor.

Dewey Livingston: Sounds like you finally solved a big puzzle that the sanctuary was worried about.

Don Dvorak: Right.

Dewey Livingston: Well, thank you all for spending the time doing this, and Jenny for putting this together. It's quite a program.

Jennifer Stock: It's so wonderful to sit here and listen. I just really appreciate it. Thank you so much.

Don Dvorak:

Well, I appreciate you giving me the motivation to go back and review.
And I love listening to the oral history of the Sacto Team, Bob
Schmieder....

[End of Audio]

