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Anniversary Oral

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Description: 2748 Dan Belknap, interviewed by Adam Lee Cilli, November 4, 2013, in his office in the Bryand Global Sciences Center at the University of Maine, Orono. Belknap talks about his beginnings at the Climate Change Institute; his interdisciplinary research with David Sanger, Daniel Sandweiss, and Harold Borns; changes in the CCI over the years; the reality of anthropogenic climate change; and conducting research in Maine and Peru.

Text: 7 pp. transcript

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Notes

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To transcriber

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Narrator: Dan Belknap

Interviewer: Adam Lee Cilli

Transcriber: Adam Lee Cilli

Date of interview: November 4, 2013

ABSTRACT: This interview took place in Dan Belknap's office in the Bryand Global Sciences Center at the University of Maine in Orono. Belknap discussed the interdisciplinary research he undertook with several members of the Institute, including David Sanger, Daniel Sandweiss, and Harold Borns. In the final third of the interview he shared his views on several topics, including how the Institute has changed over the years, and the so-called climate change debate.

Note: This is the transcriber's best effort to convert audio to text, the audio is the primary material.

Cilli: This is Adam Cilli, PhD candidate in history. And I'm here with Dan Belknap to talk about his experiences with the Climate Change Institute. And today is November 4, 2013. To get started, I'm wondering if you can tell me a little bit about just how you got interested in climate science.

Belknap: Yeah, I'm a geologist. I actually started working with my adviser at the University of Delaware, Chris Craft, doing geoarcheology. And my primary project at that time was sea-level changes. And this geoarcheology was just getting started at that time. My adviser, Chris Craft, was one of the co-founders at the geoarcheology division at Geological Society of America. So, I've always been interested in this interdisciplinary sort of approach to things. And he had some fascinating projects that he invited me on, one of which was to go to Sardis, Turkey for a summer, to work with archeologists over there and give them some ideas about coastal systems and how a geological approach could help with that. And the big theme there and ever since has been change, change, change. Many of the traditional archeologists are somewhat blind to the idea that climate, and coastlines, and sea level can change at their sites. The Sardis project is particularly fascinating because I walked down to the edge of this very elaborate reconstruction...an excavation that they've been doing since the 1950s, and I noticed that in fact it was on the meander scar of the river at that time. And I started talking about, "was there any evidence of a riverport here?" And they all just poo-pooed the idea. But we were able to take some cores and prove that, yes indeed, when the city was active in Greek and Roman times it had in fact been right on the banks of the river. And the archeologists had never even considered the fact that this river could migrate and change and so on. Chris Craft was doing something very similar in Greece; he was very famous for doing that sort of thing. So I've always had that as at least 25 percent of what I do for research. When I first arrived here in 1982, I found that there were people like Dave Sanger, over in archeology, that were interested in this sort of thing. And many other people interested in sea level change and changes along the coastline of Maine, so it seemed a natural association to get involved with those folks. And the opportunity for enriching myself, in terms of the projects that I could do, and enriching student opportunities, and just getting involved with a really exciting group of people to work with.

Cilli: Was this straight from PhD at Delaware to Maine?

Belknap: Actually, no. I was at the University of South Florida for three years and, having been born and raised in Maine, the opportunity to interview for a job in Maine was too good to pass up. My wife is from Maine as well. So, coming up here was a great move, and I never looked back. Great people at the University of South Florida; I'm still in contact with some good friends down there, but this was a good move.

Cilli: So, you say that geoarcheology is about 25 percent of what you do?

Belknap: Yes.

Cilli: What's the remaining 75 percent?

Belknap: Well, sedimentology, stratigraphy, marine geology; I like to play around on the continental margins, the shallow environments where sea level changes have been significant. I've been looking at sea level and coastal changes around the Gulf of Maine, but also around Ireland and Northern Ireland in recent years. I've done some work in Peru. I've done some work in the Caribbean. Wherever this concept of changing sea level and changing environments (over the last 20,000 years, but in some cases a couple of million)... it's the kind of thing I'm trained in and I'm interested in doing.

Cilli: Have you worked with Dan Sandweiss in Peru?

Belknap: Yeah, I've worked with Dan four or five times, and we've written a couple of papers and co-advised a number of students. It was fantastic working with Dan.

Cilli: So, can you walk me through the process of working with another scholar (say, like Dan in Peru)? Is there a point at which you two sit down and discuss who will cover what aspect of the project?

Belknap: In some cases it has to be that explicit. In some cases it's just over a beer and a glass of wine at a restaurant. For Dan in particular, he and I just clicked from day 1. We really had a lot of similar interests and similar attitudes towards how to deal with students and so on. Dan is particularly skilled at working in the field. He has a great deal of experience in Peru, he speaks Peruvian Spanish like a native, and so obviously has a lot of strengths there. He also has a good perspective for the climate change aspects of anthropology/archeology. But he knows enough to bring in experts in other fields. We started out working on some beach rouches [?] in Peru, and my experience with coastal systems was an important additional tool there. We worked with a couple of students and got some nice projects. A little bit later on we started doing ground-penetrating radar, or GO radar. And that has turned into several projects, involved Alice Kelley, Joe Kelley, and others. In other cases I've served on committees that are very much more straight archeology, but using the perspective of how landscapes change, how sedimentology can at least be an influence on people. That has been important. Kurt Roddimaker, for example, a recent PhD graduate who's just an excellent example of using all those tools in his project.

Cilli: So, in working with Joe Kelley, that was what, in the Gulf of Maine?

Belknap: Yup. Joe and I have a rather unique situation. We both interviewed for this job, and for the Maine geological survey job, at the same time: in 1982. And it was sort of a toss-up who would go to the Maine Geological Survey and who would go here. But it was a natural for us to work together, and we've worked very effectively for 30 years. He eventually migrated up here and became a faculty member. But the association with the Maine Geological Survey was the first start. We're actually closer in our training and our interests than you might often find in a small department like this. Because of the way it started, it worked out well that we were able to overlap, and I think formed a stronger team by having those common interests.

Cilli: And working together, what did you find in researching Maine?

Belknap: Boy, that's a big question. Well, we developed the first detailed slomen [?] curve for the coast of Maine. And we developed the rates at which the shorelines have changed over the last 18,000 years. We were able to develop models for sediment transport, and the changes at fairy [?] beaches and estuaries and lagoons. And a very strong component of this is the relationship to how the ice retreated and how the land rebounded, and then eventually sea level caught back up to that rebounding land, so very extreme sea level changes. There had been people working on some of those things before we arrived, but we were able to put them into a very consistent model. And then fairly recently we've started collaborating on some geoarcheological projects that culminated in one on Bluehill Bay. That paper came out this year, looking at artifacts in a submerged landscape in Bluehill Bay. Similarly, he went to Northern Ireland and met some folks over there and we've been working very closely with colleagues at the University of Ulster. I've been out on three or four cruises [with them], and they're good people. It's good to work with folks from across the pond and get a different perspective, but geologically there's very important ways to compare what's happened in Ireland and what's happened in Maine, in terms of the retreat of the ice, changing sea level, and so on. And so, having the two areas to compare makes a very fruitful area for research.

Cilli: Did you say that you also worked with Dave Sanger on sea level change and aboriginal people residing in Maine.

Belknap: Yup. And Dave was well-established when I arrived. He's the first person, I think, to take a physical sciences approach to the anthropology and archeology of the northeast. Up to that point I think a lot of the archeology had been sort of traditional, site-specific orientation, looking at lithic collections and so on. And Dave was a leader in looking at paleoenvironments, the landscapes, how people fit into the landscapes, what resources they used. As with Dan Sandweiss, I just found that we could work together very well. And we formed a good team, working with a number of students, and had great success. It didn't hurt that one of the areas that Dave was interested in was the shell middens in the area of Daramascotta. I was actually born in Daramascotta and had known about these since I was a young child. And so it was sort of a flashpoint to bring us together, to say "oh, I know all about that. That's something I'd really like to work on."

Cilli: The shell middens.

Belknap: Yup. Do you know about shell middens?

Cilli: No.

Belknap: Shell middens are basically the garbage piles that humans leave behind when they extract resources from estuaries, like oysters or clams or whatever. And the nice thing about this is when they discard the oysters or clams, it's usually on land. For whatever reason, they didn't throw them into the water. Whether it was religious significance or something else. So, now there are these fairly large mounds of the shells left behind, from in some cases 5,000 years ago, on the coast of Maine. You can tell a lot about the people by what they ate. Not everything, but quite a bit. But also the shells preserve things. Like human burials, but also pottery and animal bones, even wooden artifacts. Many things observed in these middens that wouldn't otherwise be if they were just sitting out in pine needles somewhere, so they're very much worth studying for that reason. Nowadays with more sophisticated analyses of isotopes and microchemistry of things, like phosphorous, there's an awful lot you can do with these former deposits.

Cilli: Walk me through working with Dave. You basically said, "well, I'll look at sea level change (that aspect of it)," and Dave looked at the human component.

Belknap: Yeah, usually it starts out with, "Let's get a student involved on a project. What can we do to motivate a student." And Dave would be handling the student from the traditional archeology sorts of things, and say, "What do we need to know about what the estuaries looked like at that time? What can we use for coring, and seismic profiling, and put this together?" And again it's not always sitting down and saying, "Well you handle A, B, and C, and I'll do D, E, and F." It's more, "how can we talk about things and make a better, coordinated, thesis?" Without naming names, I've worked on several other projects where the archeology is a project, and a geologist will be brought in to do something technical and will be one of the appendices in the final sight report. That's not the most desirable way to do it, but it's a very traditional way of doing it.... It's much more satisfying to be shoulder to shoulder with the other person from the beginning with people like Dave or Dan Sandweiss.

Cilli: So in both cases, working with Dave and Dan, is it how do aboriginal people respond to sea level rise, [and] how are they displaced?

Belknap: That's not the kind of thing that's usually perceptible in a human lifetime, or even several lifetimes. It's more, what resources are available, how has it changed from today, how is it changing over the longer period time scale, how are the resources different in the past from what they are today? Like the Daramascotta shell middens, which are made of oysters. There just are no oysters naturally occurring in that part of the Daramascotta today. Dave's got a famous quote. He says, "People are not oysters. No matter how many of them they ate." So, you have to be careful, especially as a physical scientist. You can't say, "Oh, well, it's the water temperature and the tides that controlled everything these humans did." That's actually called environmental determinism, and it's a big red X through archeological theory these days. People are influenced, just like you and I are influenced, like whether we wear our sweater or not. But it's not everything we do. I'm learning a little bit about archeology, [in] trying to keep the physical sciences in their proper perspective. But, as I've said, I've worked with people who are blind to some of those changes in the physical environment, and [who] I think misinterpret the historical archeology or even earlier archeology by not understanding some of those other changes.

Cilli: So, when you came in 1982, did you enter the Quaternary Institute right away?

Belknap: No, I came as a joint appointment in geology and marine sciences, worked on a couple of projects early on that were more marine geological things that I'd gotten myself. But I had known Hal Borns from when I was a graduate student, I had known several other things that were going on, and a project at the time, funded by the Nuclear Regulatory Commission, to see if the coast of Maine was warping or stable or water. And I felt that I could contribute to that. And other people thought that it made sense. And so we started doing more and more, looking for sea level curves from salt marsh peat along the coast, and trying to work that into this big question. And I found that the Quaternary Institute was a great place to work. A lot of good people. Everybody with a different interdisciplinary approach, [who] ask interdisciplinary questions. And I just enjoyed the idea that archeologists, and geologists, and glaciologists, and historians (like Dave Smith), were all involved and actively working towards common purpose, which was really exciting. Sometimes as an incoming faculty member, it can feel a little lonely and a little daunting to say, "Where am I going to find my research? Where am I going to find funding for my research? How am I going to keep my students funded?" It seemed like a natural association, and it has so proved. It's been more than 30 years for me, and 40 years for the whole Institute.

Cilli: You joined pretty soon after coming to the Institute.

Belknap: Yeah, probably no more than a year later. Probably about '83.

Cilli: How do you think the Institute has changed in the 30 years that you've been with it?

Belknap: It's changed radically. First of all because it's grown so much. It was pretty much a club; almost everybody was in Boardman Hall, and just talking to each other. Dave Smith was really one of the few exceptions, but Dave Smith was one of the most gregarious people you'd ever want to meet. And he was always making those links. Part of that was special group identity. Part of it was specific things, such as the annual field trip, and a rudimentary sort of annual gathering to hear the student reports (that later became the Borns Symposium). Things that worked well to create group identity. The Institute's undergone a couple of name changes. The biggest change was when Paul Mayewski was recruited with his folks to look at the ice coring and climate dynamics side of things. And particularly since Paul became director it's just been growing by leaps and bounds, in terms of research faculty and associations, and so on. So, in my particular opinion some things have been lost; from the small group of club-like associations, but so much more has been gained, in terms of opportunities for students, international associations, funding, and so on. I'm nostalgic enough and old fuddy-duddy enough to say that I liked that club-like atmosphere, but there are so many plusses to the way we are now that we have to weigh that against it.

Cilli: Why would you say that the Institute now has more international recognition?

Belknap: Well, 40 years of really good science, and large numbers of graduate students are out there infiltrating academic ranks. We've gained a great reputation. The more specific approach to making sure our name is out there, from things like having a really good website, going to a lot meetings, making sure that we're promoting our students...getting out and giving talks. Just all the sorts of things you need to do to have your science recognized. But I think that basically it's doing good work, and people recognizing that. As a group...lots of people doing lots of good work.

Cilli: Outside the scientific community, climate change is still an issue that's up for debate. And I'm wondering if you can comment as to why that might be the case.

Belknap: Well, it's strange to me. I think that a good 99 percent of the physical scientists that you ask will tell you that climate change is not a question. It's very obvious that climate is changing. Some smaller number might not be completely convinced that it is human-induced change, and not just part of a cycle, but I think those numbers are dwindling as well. I feel very strongly that the so-called debate about climate change is politically-driven, ideologically-driven. And the handful of scientists that they site... there's always going to be somebody who claims the earth is flat. And if you want to have a "balance" or "even" view on this, you can always drag someone out of the woodwork who's gonna have a contrarian view. And if you promote them and give them as much air time as an established scientist, you're gonna see that conflict. The funny thing is, for most good scientists, there's always this nagging thing in the back of your head that says, "ah, but, everybody disputed Galileo, too." You have to realize that there are going to be things that we're almost completely convinced about that are just plain wrong. But that's the way science works. You keep working until you can disprove a widely-established way of thinking and move on from there.

Cilli: So, what would you say was the most difficult place you worked?

Belknap: The most difficult place I worked... I've been out in hurricanes more times than I can count. I've been so seasick that I was afraid that I was not gonna die [chuckles]; I've used up a lot of my nine lives, maybe more than my nine lives. But in terms of difficulty I would say that Peru was probably it. Without Dan Sandweiss as the leader and the interpreter of the group, it would have been impossible for me to work there. I'm not a warm weather sort of person; working out at 110 degrees and zero humidity, and carrying around a 50 pound backpack for ground-penetrating radar, was challenging to say the least. But on the other hand, great people to work with, and everybody sharing the burdens, and we got it done.

Cilli: I'm wondering if you could walk me through a typical day of research in Peru.

Belknap: Yeah. One of our projects, Los Moteros, ground-penetrating radar over this ancient mound. We debated whether it made sense to camp, but in my opinion it was just impossible, cause there is no water. You had to be in a town. So we would leave from some rudimentary hotel in a town about a 40 minute drive away, we would head out toward the coast over some gravel tracks (in four wheel drive vehicles), we'd have to have special permits just to get through some of the lands just to get to this place, and even still we were quite likely to bandits, or more likely somebody running a chicken farm who just didn't want us to cross the chicken farm. But again, prior preparation—getting to know the area, talking to people in the area, getting known in the area, having folks realize that we didn't have anything valuable worth stealing—never really had a problem that way. Arrive on site, set up the equipment, work all day, take a break at noon for a lunch of whatever we carried out there, local fruits, cans of something euphemistically called tunafish, or ground sardines, which looked and tasted like catfood. Trying to stay hydrated all day long. And quitting a little before sunset. Again, we wanted to get back in town before it got dark. Just for highwaymen and whatever.

Cilli: You took a jeep out to the site.

Belknap: Yeah, usually two. And usually with a local driver. It was part of the process of making sure we're in sync with the locals. [We would] be very dehydrated. We had a couple of graduate students that did not recognize the importance of wearing a hat and staying hydrated, and basically we'd have to lie them down in the shade and keep pumping water to them. But being out there for ten days, it'll prove to yourself whether you can do that kind of job or not. A number of students saw that there are difficulties; there are things you have to do to get a project done. But if you succeed you feel better about yourself being able to get it done. And see that it can lead to great rewards, intellectually and otherwise, as you move forward. I look back on it as a lot of fun, but at the time it was tough.

Cilli: What part of Peru was that?

Belknap: That was northern coastal Peru.

Cilli: Pretty hot, then.

Belknap: Hot and dry. Some of the driest areas on earth.

Cilli: Well, I think that's all the questions I have, but before I conclude the interview I'd like to give you a chance to add something I didn't think of asking.

Belknap: I think I covered it pretty well with the change in the Institute. It was and still is a great opportunity for faculty and students to find this interdisciplinary association for research and the academic enterprise, which I've always felt is very stimulating. In some cases it's difficult to... if you become the world's expert on a particular set of minerals, you may be that world's expert, but the potential for growth and new finding and so on is also limited. I think in a modern world these interactions, biophysics, geoarcheology, environmental chemistry, whatever you want to come up with, this is the great new horizon. Again, as you're a historian, climate history. Dave Smith and others here were some of the first real drivers of climate history. And there's a lot to be learned in understanding of people's diaries from the 1700s in Maine. Lots of opportunities right on those boundaries between fields. So, any student who listens to this, I would encourage them to think outside the box. Think about those opportunities to go in different directions.

Cilli: Okay. Well, thank you.

Belknap: Alrighty. Thank you.