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## Borns, Harold oral history interview

Andrea L'Hommedieu

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## **Interview with Harold Borns by Andrea L'Hommedieu**

*Summary Sheet and Transcript*

### **Interviewee**

Borns, Harold

### **Interviewer**

L'Hommedieu, Andrea

### **Date**

October 23, 2003

### **Place**

Orono, Maine

### **ID Number**

MOH 415

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### **Biographical Note**

Harold Williams Borns, Jr. was born on November 28, 1927, in Cambridge, Massachusetts. His mother was Blanche Borns and his father was Harold William Borns, Sr., who worked in the potato chip industry and was very successful. Harold Borns, Jr. entered the military and served during World War II. After the war, he attended Tufts University where he developed an interest in Geology. He received his Ph.D. from Boston University and did post-graduate work at Yale where he changed his field to glacial geology. He has taught at the University of Maine at Orono since 1956, the longest of any current professor. He established a quaternary Ice Age interdisciplinary group at the university. He credits Edmund Muskie with influencing the acceptance of interdisciplinary studies.

### **Scope and Content Note**

Interview includes discussions of: family background; field of Geology; connection with Edmund Muskie; starting a quaternary and glacial geology center at the University of Maine at Orono; and interdisciplinary sciences at the University of Maine.

### **Indexed Names**

Borns, Blanche  
Borns, Harold  
Borns, Harold William, Sr.  
Muskie, Edmund S., 1914-1996  
Nicoll, Don  
Smith, David C.  
Stalin, Joseph, 1879-1953

## **Transcript**

**Andrea L'Hommedieu:** This is an interview with Harold W. Borns, Jr. on October 23rd, the year 2003 in Orono, Maine, at the Bryan Global Science Center, and this is Andrea L'Hommedieu. Could you start by giving me your full name and spelling it?

**Harold Borns:** My name is Harold William Borns, B-O-R-N-S, Junior.

**AL:** And where and when were you born?

**HB:** I was born on November 28th, 1927, in Cambridge, Massachusetts.

**AL:** Is that the area in which you grew up?

**HB:** I grew up in the Boston area, in various suburbs of Boston.

**AL:** And what was it like at that time? Now, you were probably, have memories at all of the Great Depression?

**HB:** Yeah, I lived in the Depression, but I never realized it. I didn't know if I was in a Depression or not, you know, how would I ever know? And that's the way life is. So I, yeah, sure, I grew up in the Depression.

**AL:** What did your parents do for occupations, and what were their names?

**HB:** My father's name is the same as mine. My mother's name is Blanche, and she was a housewife throughout the Depression. My father graduated from Tufts University in the middle of the Depression and had various jobs in chemistry and in many ways, he worked in gas stations at times, it was one of those times when you took anything you could get. But he eventually, slowly moved into the areas where he wanted to be, and he ended up actually as a, in the potato chip industry ultimately. And he owned a, he was a sales manager and then eventually owned it.

And he, at the same time, continued to be interested in history and chemistry, that he trained in in college, and did a lot of formulations, chemical formulas for the food industries. He formulated ways to manufacture pickled relish that was then to be mixed with mayonnaise and other things like this. And you can't just do that; if you try it you'll see why. He just did a lot of

things like this. He also formulated polishes for antique people, antique dealers. He was just interested in these things, almost from a hobby point of view. So he did this all his life and was very successful in the whole area, while he was originally aimed at the diplomatic service and that just didn't work, because my mother got pretty ill at that time and they couldn't, his first assignment would have been China and he just, there was no way they could do that. That was during the Depression. And so, that's the way it worked.

But anyways, he turned out to be a pretty successful guy all the way around. And he was responsible with a man named John Cain of Cain Industries, Cain pickles, Cain relish, Cain potato chips, Cain's everything. The two of them got together and they designed a potato themselves that would be the best kind of potato to use in the potato chip industry. And they then took that to the University of Maine and the experiment stage and developed that potato that is now called the Kennebec potato, and it's probably the most popular table potato in the country at the present time. But it had the right characteristics of sugar and starch and lack of eyes, and color and roundness, to be the essence of the potato industry. So that's, he did that, too.

**AL:** That's amazing, yeah.

**HB:** So anyways, an interesting person.

**AL:** And did that lead to the, did that interest you in following the sciences? Or was that just completely different?

**HB:** Not a bit.

**AL:** Well, what interested you in going into your area of geology?

**HB:** I came out of the military after WWII, I was an electrical, I was an electronics technician in the Coast Guard, and came out. I worked for Bell Telephone for a while putting up microwave towers around New England, and my father finally convinced me I should go to college on the GI Bill, and so I did. And I started out at Tufts University as an electrical engineer and very quickly realized that that wasn't electronics, it was cables and transmission lines and clunky generators, in contrast to electronics it was like a sledgehammer versus lace. And I just didn't like that, and, but I was required to take other science courses and English courses and things to educate me, as all engineers, you know, get accused of not being educated, and so I took geology. I said, "What's this? I'll take that course" And I was turned on, completely turned on by that subject by the professor, and I just stayed with it. That was the end of electrical engineering. I just moved directly into geology which is, you know, deals with math, chemistry and physics as applied to the earth. So I stayed in the sciences.

**AL:** And at what school were you at, at this time?

**HB:** Tufts, Tufts University.

**AL:** What led you to come to Maine?

**HB:** Well, after I got out with a bachelors degree I tried a lot of things. I worked for the United States Geological Survey in Washington and did various things. And finally I ended up as a field assistant in marine geology at the University of Rhode Island on research projects and that's when I decided I'd better go to graduate school, so I went to Boston University and got a masters degree and a Ph.D., and then I went to Yale and changed my field into glacial geology versus ledge geology and hard rock geology. And then in the process of all this, a job opened here in glacial geology and I got the job, so I've been here ever since.

**AL:** And what year was that?

**HB:** Nineteen fifty-six, fall, September of 1956, which then tells, doesn't tell you, but I'm the oldest professor on the campus in terms of having been here longer. I've been here longer probably than any of the administrators, too, I'm not sure of that. But anyways, I've been here forty-eight years, yeah, forty-eight years, forty-seven years.

**AL:** So you have some seniority, don't you?

**HB:** Yeah, right, but it doesn't do me any good.

**AL:** Well, tell me what your connection with Senator Muskie was, and what you were starting to tell me before we started.

**HB:** It's a long story, but when we, we were a geology department that was really within civil engineering at that stage. Geology has been taught here since the school began, but it's been taught, it was taught originally as an agricultural subject basically focused on soils and things like that and there's always been a soil chemist around. So somewhere along the line, I've forgotten the details, geology was, a geologist was hired in the department of civil engineering to teach geology to civil engineers, and then that grew to three or four or five people and we were all in civil engineering, and yet by that time we were essentially, all our graduates were not in civil engineering, we were just still teaching geology to civil engineers, but also we started producing graduates in geology in the college of arts and sciences. And eventually we, probably around 1960, I've forgotten the dates, we became a separate department out of civil engineering, out of engineering altogether and under the college of arts and sciences. And at that point we decided that what we wanted to be in the future, and we wanted to be a department that was known for both, a balance of teaching and research in a classic university type of role. At that time, that wasn't the common thing.

We wanted to be formalized, we wanted to formalize this, that our role in life was that. But then we had to decide, as a small department, how can we be competitive for students and research grants at the national levels to support the research. And so we did a survey of things, each one of us in our own field, and we decided that my field of Ice Age geology was probably the most competitive field to get into. And at that point I had gone to demonstrate that to the university. I had gone to the National Science Foundation and asked the program managers if this was a good field in the future from their perspective, to move into Ice Age science. And then I went to the National Academy of Sciences in Washington and asked them the same question. And the answer was yes, but the way to go is multi-disciplinary, not just as a single person but the role.

They felt that there was going to be an enormously expanded interest in the world we lived in, which is the Ice Age today, and where did we come from in the past. Not we as people, but how has the modern environment come into being, and where is it going in the future.

And so the best way to approach that is with multi-people, multi, so, geology, botany, oceanography, if you will, glaciology, which is ice physics, glacial geology, which is the results of glaciation, in other words, each one of these fields are unto themselves a field and no one person can have all this, and archeology. And so the way to do it is to form a multidisciplinary organization for teaching as well as research, and how do you do, the question is, so that was the recommendation from both the National Academy and NSL. They said, "If you do this and you do it in a hurry, you'll be able to do something that no one else has been able to do." And at that time I had been at Yale where they had the potential of doing this, that's why I went there, but they never formalized it and Yale, the Yale corporation decided they weren't going to move in the direction of environmental stuff. They considered oceanography and lake work and botany and so forth as environmental. They were going to move away from that, which they did, and did something else. And that left the field open, sort of, in this region for this kind of thing into which I felt we should step, and the geology department felt we should step into this. At that point, this was proposed to President Libby, President Libby said, (now we're getting into the time when Senator Muskie was proposing environmental science research, same time).

**AL:** Early sixties?

**HB:** Yeah, I just don't have those dates. So President Libby said, "Hal," he said, "I think that's a great idea but," he said, "why don't you work for me for a year and try to look into the possibility of developing an interdisciplinary environmental science as such on this campus." And I said, "I won't do that. What I want to do is establish a quaternary, an Ice Age interdisciplinary group." He said, "Yeah, we'll talk about that later." And I said, "Okay, so the implication is you do this for me, and I'll do." So I did this for a year. And I learned an enormous amount about the politics of this campus and why you can't do things, and the territorialism of departments and lack of cooperation. And there we have a whole college of agriculture that deals with, that dealt with botany and that dealt with soils, and on the other side of it here we have another college called arts and sciences that deals with geology and gravel. Here we have civil engineering that worries about road materials derived from rocks, so it was all sort of like this. And then there was botany in that college and zoology in the other college and they didn't talk to each other, and it was almost . . . That I found out was just exactly this, and those roots of that type of behavior were so deep that it was pretty obvious to me that we couldn't change much about it.

However, we did form something called the Environmental Studies Center out of it, which was not attached to any department. I was the first director and my job was to see what we could do. So we tried an experiment, and we managed to get, there were projects that related to, coming from the federal government into the university, related to water supplies, ground water, wells, hydrology and so forth that were sort of multidisciplinary in a way, and they didn't have a specific home and so this became their home. And then we got some money from the Ford Foundation to do a study of the Penobscot River as an experiment. It was interesting, that, you know, because the river was polluted, and what were the attitudes of the towns about this. And

so we did this sort of multidisciplinary study of the Penobscot River and the attitudes towards, scientific attitudes, political attitudes, why can't we make this river clean, why can't we make it more useful for everybody, you know, these kinds of things.

And so we got money out of the Ford Foundation for a couple of years to do this, and it was designed to see if a university can come to grips with a multidisciplinary type of research, and in this case it was, had an objective to it, you know, and in fact it did something. And so this was an experiment in this kind of developmental field of environmental science. Now, that's the way that went for a while. Then eventually Libby asked me if I would persist with it, and I said, "No, that's not my field. I want to develop an Ice Age institute." He said, "Okay," and so the quaternary environmental studies center had a new director who came from the outside in the field of water, and it sort of eventually changed around to a lot of things and died.

**AL:** It's not here any more?

**HB:** I don't think it's here any more. And because, as the university decided not to put the proper amount of money into it, it had no solid base, you know, it was all, they had no faculty, it had no, nothing, it was just an entrepreneurial center. Well, so it could have worked, but it didn't, and as such as it was conceived, and it was pretty obvious why, because it was, had no tenured people, had no staff members besides the director and a secretary, you know, and then they had to solicit help and cooperation and all this.

**AL:** From all these departments that didn't want to cooperate.

**HB:** Yeah, and so we're back to the problem of how universities come to grips with this type of thing. Well, all right, so president Libby said, "Okay Hal, and we're going to do it." And he said, "I'm going to make, ask you if you want to be the first director." And, he said, he pointed out to me, he said, "There's no way I can say no to something that has academic excellence to it." And he said, "There's no reason to believe that this is not going to be one of those things." He said, "I can't say no," but he said, "I can say that I can only do it as far as the money goes," in other words I can. So he said, "We're going to have to build it slowly." And by that time I had laid out the plan of staffing, two of this, two archeologists, two geologists, two, you know, with overlap, each one of these, there are two people like me here, still, and we have overlapping interests, and we have several archeologists and so forth and all those things. Well, okay, that's fine except that, and now that's about the time that I got introduced to Don Nicoll, or is it Nicolls?

**AL:** Nicoll.

**HB:** Nicoll, yeah, because he and Libby and Muskie were all talking to each other. In fact, that's where the whole, I'm sure that Libby, that's where the whole idea of an environ-, how does a university come to grips with it, and that's what Muskie was asking of this country, and Libby responded to that. And I think, I can't, I never discussed that with him directly, but Don Nicoll said, "Well, you're doing what needs to be done." But he said, "You'd better read this." And he handed me a grey book about this big, and it was a Senate document and, which I've lost and I've never been able to find another copy. No one's ever been able to find, I can't find anybody that

can find it anywhere, you know. Not the one I lost. I didn't lose it, I loaned it to somebody who lost it years later, because people wanted to know how we ever do what we did because other groups decided they wanted to do something like it on their campus.

Well, what that book was, it was a Senate report which is in the library somewhere, and how you access it, I don't know, but it was a Senate document and it was fostered by the senator and it was a survey done of all academic institutions in this country that would respond, all the universities, state universities (*unintelligible word*). And the question was asked in there, "Do you have, or have you ever had any experience with multidisciplinary units on your campus? Science units, research units, any kind, anything multidisciplinary?" Then they surveyed that and got all of this information, and then they, the report, the solicitation asked apparently, "Let's look at how these are structured and were they successful or not successful. And so this was, all these questions were asked. And I've never seen the questionnaire, but there's the result, this bulletin.

And what they were trying to find out is what structures, what academic structures do you use to assure that a multidisciplinary unit is going to exist in a non multidisciplinary campus. What makes it successful or what makes it fail? So the bottom line came down, and at the bottom, at the end of this whole thing, it says, "These are the characteristics of success. These are the characteristics of failure." And then, so I took that and I looked it all over and then went to the president and I said, "If we're going to have a quaternary institute, then we have to adopt the characteristics of success, and it's going to be hard to adopt them because they're so different than the way the university runs." And he said, "Okay," and we underpinned the institute for quaternary studies, which is now under a different name, and it's the longest, it was the first unit like it on the campus and it's still here and it's extremely successful. It worked.

**AL:** It worked, that's wonderful. **HB:** Yeah, and that's how it all got started. If we had done it any other way, we would have adopted the characteristics of failure. Normally a university adopts the characteristics of failure. For example, they'll say, "Okay, we'll have a multidisciplinary unit that will be overseen by these traditional departments, so we'll have a unit." And oceanography started here, that started here that way, because that's the normal way because some chairman of a department says, "Well, I'm not going to let this thing get away from us because if the unit gets the money, we won't," so, you know. And so we ended up with an organization that was controlled by five departments, all of which were really looking after their own welfare and wishing this would go away, but it didn't.

And that was oceanography. It took a long time for that to really develop into, and in my opinion it's never really developed properly because of that original setting. But the characteristics of success are, let's see, if I think about it, very simple: the institute, the multidisciplinary organization, has to control the hiring and firing of its staff; it has to control its programs; and it has to control the reward systems. Just that. If those things are controlled outside the institute, you lose it because someone will say, "Okay, you guys have a botanist there, that botanist is paid by our department but we've made a decision to move in a different direction, and we're no longer going to support that so the man has left. We're not going to replace him in the institute, we're going to go and hire someone that worries about dandelions." And that's the end of the institute then because you've lost the guts of it and there's no control. So you've got to control it.

So, what we did is, the administration did that, and then they, for the people that were here, I was the first director, and very slowly we started adding people and we decided that the model would be to - - it's a long story. I mean, that's the fundamental thing. Now the question is, how do you manipulate it to everybody's advantage. And so the first thing that happened is the vice president for research split my salary right down the middle and he said, "Okay, seventy percent of it is going to be in the institute, and thirty percent of it's going to remain in the college of arts and sciences." Bang, that's it. And therefore the control (*unintelligible word*) the institute. And yet, I still lived in the department. And so instead of pulling everybody together in an institute and essentially make a new department out of that, which is not what we wanted to do, you lose your flexibility. So we worked it out so that staff has been hired in such a way that the majority of the salary lies in the institute, so the institute has the control. The split between teaching and research is controlled in the institute and so forth. Now, that's all one thing.

Now how do you then, then, oh, then amongst those characteristics of success is another part of it, you have an operating budget that's yours, you're not asking one of your associated departments to provide travel funds to go to meeting, you know. And so the control is in the institute, but we had to, we, my feeling was that we, in this institution at that time, and still is the same way, we should let these individuals, like an individual archaeologist or an individual (*unintelligible word*), live in the department, the formal traditional department, and contribute to the teaching of that department at the expense of the institute. In other words, it was a net gain to the department, departments love that. And so they'd get an extra person, doesn't cost them much, they get courses taught, and when it comes to bean counting, numbers of students being taught by that department becomes a very positive thing. When that person gets a research grant, we let the department take the credit for it, that's another net gain. So in doing my job, and I, this was all my doing, I just worked it that way and so pretty soon we have departments not wanting to take us apart and dismantle us, but they were encouraging us because it was to their advantage. So that's the way we went.

And so, and there are a lot of little nuances that, you know, would take a lot of my time. I'd have to go down, you know, go and spend some time in those departments and I'd talk to the staff and come to faculty meetings occasionally and talk about it, we'd compare notes and, yeah, well, if you could do this it would help us and vice versa, (*unintelligible word*) "Yeah, you do that. We'll do this." And so it's been a very nice cooperative venture with three or four departments, to the benefit of the departments.

Then I figured the way, we don't want to look like a consulting firm, either, with no attachments, and that's another reason for going with the departments. I wanted this institute to look like a department but not be one, because within a university the departments are the primary structures, or the structure of the university - - physics, chemistry, geology, English, history - - these are the fundamental pieces and you've got to look like them and become part of them. And so we, to do that you've got to have a budget of your own, number one, and you've got to have an academic program of your own. So we developed a master's degree program in which the courses, however, are housed in the departments, so they benefit from the department, from the course numbers. So we have a master's degree. And so now we look like a department but we're not.

Now, we don't teach undergraduates, as an institute we don't. If you do that, if you get into the undergraduate teaching business directly, like a department does, then you're stuck because then you have to have very definite kinds of professors, subjects, and you lose your flexibility to move and hire odd people to fit the needs. But at the masters level it doesn't make any difference, and if you've got a student, I mean we leave the undergraduate teaching to the traditional departments. So we didn't get into that stuff, that level. But I've been teaching undergraduates in geology forever. So I still teach in the undergraduate world, we just don't have a program like that in the institute for those reasons, because we lose our flexibility to move with, to, we tried to develop a system where we could be flexible enough to move towards the desirable science frontiers as they developed, so stay on the edge, because if you don't stay on the edge you lose your ability to compete for research funds. (*Unintelligible phrase*), so, it's all a maze of this kind of development that I did over a fifteen-year period. Then I backed away from it, I went off to Washington to run the United States Antarctic research program for three years and resigned here, and then came back, I was on loan. And I've been a normal professor ever since and that's the way I want to be. So in many cases, institutes like this develop but as soon as the person that conceived the idea moves back the whole thing collapses. And after fifteen years, I really had the feeling that this would not collapse now without me, and it didn't.

So, but the point is that whole thing, this is the first multidisciplinary organization like this on this campus. It's the first research unit, let's say, research unit, on this campus outside of agriculture, the whole college of agriculture, which doesn't exist any more as such. This was the first move in this direction on this campus, and a number of things with variation on the theme have developed since then. And it's been extremely successful. We've trained lots of students, we've brought in, we're researching all over the world, research money has been coming in to us, that money supports students, supports undergraduates. We've taken a hundred undergraduates to the Antarctic over the years, supported the graduate students doing a lot for Maine as such, as well as elsewhere, and it's been a total multi disciplinary unit success. And the whole thing goes back to Muskie and his interest in how does, again, how does a university come to grips with multi disciplinary research in environmental sciences. And it's not the environmental sciences, I mean that's his question.

**AL:** Right, but that's not what your thrust is.

**HB:** Yeah, we're doing exactly multi disciplinary science, we're doing environmental science. But his question specifically was related to his understanding that you're not going to tackle modern environmental scientific problems with the same old discipline. You've got to do it in a multi disciplinary way, and he recognized that multi-disciplinaryism in a university is damn near impossible to achieve because of the hide bound departmental structures of the university. And I think the departmental structure of a university is detrimental to teaching and research, but it's instrumental in making it easy to govern. Governing, governance is easy that way. Multi disciplinary governance is not. And this, the senator knew this, and having talked to an awful lot of people over a long period of time. And so it came from him to us, and this university was, in my opinion, behind a lot of places still. They're always after the fact, you know. The student rebellions of the sixties didn't get here until ten years later.

**AL:** Oh, really.

**HB:** After Berkeley, and probably people at Berkeley were saying, 'what are those people in Maine doing?', it's all over, and we're still having sit-ins. But everything comes a little bit late, and that's always good because then you have hindsight, you know, it worked there, it didn't work here. Well, most of the research on this campus was thought to relate to the agricultural - mechanical arts area, this is, I mean this is the land grant concept. So research in other fields wasn't really encouraged very much, and that's a little bit behind times compared to most institutions by that time. Sputnik had come and gone, and the National Science Foundation was developed out of this enormous fright that the Russians are so far ahead of us. We had scientists writing to Stalin saying this is the greatest, you guys did the greatest thing for American science that's ever been done by sending off Sputnik. All of a sudden the United States woke up - - we're behind. And so things were a little slow in coming here, and in retrospect that's a good thing, I think, because we've been a little bit more methodical and could see what was going on. And, and, with that document in the Senate, you got a view of the whole country as to what not to do and what to do. Left to our own devices, we would have adopted the wrong methods because that's the way universities operate. We would have formed a group that was controlled by other groups, and then that fails.

So the institute is a little, is a different kind of beast. It's just different, that's all, it's just not the traditional way. But that all came about, as I said, because of Muskie's realization that the universities were not being able to get on top of this kind of research, and it had to be multi disciplinary, and you've got to form units in the universities to do it. And he laid that out, had that document developed, the document became the bible - - very few people even know that, that that document exists. And we were handed a book like that by Don Nicoll. And he and Libby, and I think president Libby certainly knew Senator Muskie, they had to.

**AL:** Did you ever get to meet Senator Muskie?

**HB:** No, never did. Dave did, I haven't. But I think he in a sense revolutionized, ultimately caused a revolutionary development on this campus, which very people understand today that are here. I understand it (*unintelligible phrase*).

**AL:** I didn't know it, and I went here for four years.

**HB:** But it's a whole different ball game, and the point is it's been successful because of that report and because of Muskie's leadership. In other words, environmental, multi disciplinary environmental research is necessary if, with where are we living. And he recognized the growing need, he figured out a way to do it and what the problems in general with the universities were to accomplish it, and he had that survey done. The survey made recommendations, we took advantage of that, we have a unit that developed out of that, from those basic, basic fundamental principles, which has been entirely successful. It comes right back to, if we could see Muskie today he'd say, "My God, you guys did it." And it's environmental research, we live in the Ice Age, and when you have an Ice Age institute you're working on global climate problems. I worked all over the world.

**AL:** Could you pinpoint within a year or two of when that bulletin was written?

**HB:** Yeah, I can. I can't do it right now. What I have to do is find out when president Libby was president. I've got this on my vitae somewhere, because I've got down that I worked for Libby from such and such and such and such. It was during that, that's when it became apparent to me through Don Nicoll. Don Nicoll will know, but I can't find it. I was talking to Dave Smith about it, he said try the government document people here and I said I would, but I figured that the Muskie Archive must have this.

**AL:** It may.

**HB:** But they can't find it.

**AL:** Have you called the archives?

**HB:** Yeah, they didn't get anywhere.

**AL:** I'll look, too. A second set of eyes sometimes can help.

**HB:** It's a little gray, most gray, bulletin, it's that thick, it's that big, and it has to do, I don't know what the title is, but it is a survey of multi disciplinary organizations in American academic institutions. That's what it is.

**AL:** And how did you get David Smith, a history professor, working in here?

**HB:** Very easy. No, it wasn't easy. We took on a project, well, multi disciplinary, we took on a project along with the Maine Geological Survey to study what's going on on the, is the coast of Maine sinking? And that question was posed by an archaeologist in our organization, Dave (*name*). He worked for years with the Canadians. He was the archaeologist for the big National Museum of Man, which has changed from "man" to "civilization" now, in Ottawa. He was responsible for the maritime provinces, the archaeology of the maritime provinces. He's American, but he lived in Canada.

Anyways, he worked around Passamaquoddy Bay and that whole area up in New Brunswick a lot, and he realized that the Indian shell business along the coast, the garbage dumps, you know, the shell piles, were going under water and the sea had almost come up over them. So all he could find is the younger versions of it, around three or four thousand. And yet, if you went eastward along the New Brunswick coast or westward along the Maine coast, you'd find shell business dated at around six thousand at the coast, but in the Passamaquoddy Bay region you couldn't, they were three thousand years. So either the Indians didn't live there, or they're going under water. And we said, we're going to find out because that has to do with (*unintelligible word*) at the coast. Well, money is where it is and the Atomic Energy Commission, Nuclear Regulatory Commission, was interested at that time in documenting the stability of the coastal zones of the United States, so when an application for a nuclear power plant would come in they would have some basic understanding of that part of the coast, and they weren't about to allow a nuclear power company develop in an area where the thrust of the earth was kind of flexible. So

as a result, that's where the money came from.

So we started looking at sea level - land level changes from a glacial scale to a, glacial time scale, to an archaeological time scale, to a historical time scale, to a modern time scale, modern being surveying, actual land surveying done along the railroad tracks of Maine done in 1926, for example, and then redone in 1966. And at this point between 1926 and 1966, did that point change? It was set up, and let's say it was a hundred feet above sea level. Today you measure, and it's only ninety feet above sea level. Now that means sea level has come up, or land level has gone down.

So it's right to that kind of degree of thinking, but also archaeological thinking, the shell business going underwater, the geological thing as the ice went back to sea, and then to Millinocket, then the land came up and the sea all but drained away, that's big, kind of, harder you know, thousands of years of scale here. So we did it on all scales. Well, now you get to the historical scale - - what do we have along the Maine coast that is of historical times that's going under water, or is at water level. In other words, if it was built at the ocean level, is it now under water or above water or just where it was built. And so how do we do this? So we asked, we're going to find a historian. And so that's where Dave comes in. So Dave did a survey, and he found colonial shipyards, for example, or colonial docks or colonial tidal power mills where the sea, the tide would come in and go out and turn the wheels and cut lumber and that sort of stuff. And so he, all of us (*unintelligible word*) did this. And now the question is, how old is it? So then you've got to put dates on this stuff, and so now you can say this was built in 1850 at sea level, today it's two feet under sea level, so the sea level has risen two feet -

*End of Side A*  
*Side B*

**AL:** We are now on Side B. And you were saying?

**HB:** So that, if we're going to look at historical features to get sea level out of them, we've got to have a historian whose methodologies, research methodologies allow the finding out of how old things are. And so Dave Smith was one of these people. He's a landscape, farming historian, farm, is an agricultural forest historian interested in landscapes, but he's also eclectic in many ways and he was happy with this. Now what a, this is two side, again, we're playing benefits. We get out of, the institute gets out of it what it wants in terms of sea level, Dave Smith gets out of this research funds that allow him to better define the history things that he's interested in. So everybody, it's a shared relationship. He benefits in his field, we benefit, I benefit in my field, the project benefits from it, and this has been the relationship with the historians for a long time.

And that's, we now in the institution, we have people that are anthropologists who deal with cultures, one of them deals with cultures in New Guinea, for example. But he's interested obviously in the climate changes of the environment, and that's what we do. So, you know, so pretty soon maybe he's in a position of saying, "Well, I see a major cultural change from the year 1850 that's been different ever since; is there anything in the climate record that shows anything like this?" "Yeah, there is, and here it is," and it comes out of the ice core work or out of the pollen work in Nepal, you know, or something. And so again, it's one of these multi disciplinary

supportive, mutually supportive operations. And so that's the way we go, and that's why we have a historian tied into the science. But not all historians would do this. If you find the right person, you've got it.

**AL:** Is there anything that I haven't asked you or that we haven't talked about that you think is important to add to this today?

**HB:** No, I don't think so. But that's my contribution, but I will say once again, if it wasn't for Senator Muskie, we would not be doing what we do and this, although it seems small, really was a revolution in how this university operates. And the time was right for this institution. I'll give you an example of something: I got the first National Science Foundation grant, research grant, on this campus, 1965, first one. They'd been operating for many years before this, but this university had never applied for anything. I did, I got the grant, it was a small amount of money, and it was to study the glacial history as recorded in the north-south Kennebec Valley. I took this on as a research project because very little had been done in my field since about 1930, and the ability to actually get real dates on things, on events, was developed in about 1950, radiocarbon dating, and so the time has come to do something like this.

So I got the grant, and it came and I asked the controller of the university, the treasurer, "Could I have an account number." And he said, "No," he said, "that's tainted money." I said, "What do you mean, tainted money?" He said, "It comes from the government, you shouldn't have asked for that. You should be ashamed of yourself." He said, "I don't want it in the university accounts." I said, "What am I going to do?" He said, "Put it in your bank account and let me know what you did with it afterwards." If I did that today I'd be in jail. And, but why? And the reason was, he said, this year, I said, "We accept money from the U.S. Department of Agriculture to support the experiment station, agricultural experiment station and other things, under the Hatch Act and other things." He said, "That's what this university should be doing. That's legitimate money because this university was designed to be, to teach and research in agriculture and the mechanical arts, not in your field." That was the attitude in 1965.

**AL:** Thank you very much.

*End of Interview*