Name: David Klein
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Location of Interview: Home of David Klein in Fairbanks, Alaska
Interviewer: Karen Brewster

Brief Summary of Interview: In this interview, Mr. Klein starts off talking about faculty coffee breaks, and how the institutes were not part of the University originally but were eventually merged with it. He also talks about modeling versus field work and his feelings on that, how students and biologists are missing out by not doing field work, environmental work he's done, his love of living systems, and geology of the Bering Sea islands (St. Matthew and Hall) with the auklet, murre, and fox population there. He also talks about why he got into ecology versus something like architecture, and shares his feelings on facing and handling challenges, regrets and disappointments.

KAREN BREWSTER: Alright, today is November 21, 2014, and this is Karen Brewster and Dave Klein. And Dave, you were talking about regular faculty coffee breaks in the department.

DAVID KLEIN: Yeah, which sometimes you'd be frustrated because -- and we'd eat frequently, bring a bagged lunch and sit in there in the same room and have lunch.

KAREN BREWSTER: And I should say this was when, was it, Peter Morrison?

DAVID KLEIN: Peter Morrison was --

KAREN BREWSTER: Was head of IAB (Institute of Arctic Biology).

DAVID KLEIN: He was the head of the Institute of Arctic Biology after Laurence Irving, who founded it. And he was -- and he was good at operating this kind of research institute. When it was a new biological research institute. The Geophysical Institute was first, and the institutes had to be -- they had to have their own organizational structure including their own accounting, budgeting, etc. And the university was -- it was sort of like they were just having the space available that the university provided. And the university didn't have too much power over them. And, of course, it gradually shifted, because they were part of the university system, they couldn't be the ones that were running it. Although early on, yeah, they were having -- in terms of funding being brought in, yeah, they were -- had a lot of power that was hard for them to relinquish when the university and regents and everything wanted them to behave more like a component of the university. But at any rate, these discussions with the head of the Institute of Arctic Biology and then later it merged with the teaching and it was called, for a while, the Division of Life Sciences, which included then biology and wildlife. And that mainly took place during a term when we had this Englishman, who was the director.

I'll think of his name. At any rate, those breaks were nice because, you know, you socialized a bit and that's nice. You kept in touch and sometimes someone was -- some tend to brag a lot about what they were doing or their students. Others, you know, weren't necessarily braggarts, but they would have pride in what was being done by their people. And so you get -- and then there was -- A good thing about an institute, yeah, there were researchers working together as a team and that's one of the big advantages of the institute. And then they treated me as part of the institute, even though I was mostly -- it was mostly related to graduate students and in the early days, master's students working through the Cooperative Unit. Where I was able to bring in small amounts of money to support the students, where they were bringing out money to support the professors that were doing big research projects, and maybe sometimes they could get a student stipend involved in it. But they admired the fact that the Cooperative Unit Program made it possible for them to sometimes serve on graduate committees or be major advisors even. Other faculty where I couldn't be responsible for all of them, and the subject area might be more along the lines of people in the -- on faculty institute. But it was a nice way to do it socially. And then we had these foreign exchanges with, especially Norwegians, and we occasionally had others. I remember some of the discussions with Norwegians, they were great, especially lunch, and -- It was easy to connect -- Alaskans to connect with Norwegians. We had a lot of the same interests, we appreciated the environment we lived in. Many of them were skiers and working with caribou or reindeer, and so we'd worked together in the field. But then they began appreciating, which I always have when I've been abroad, you know, getting their views of the people that live in a country, about world issues. You know, the Cold War, for example, and the world in general. I remember a debate I had with this one woman post-doc, where, yeah, I was pretty attached to her. And she was pretty worldly. She had married a medical doctor, Norwegian medical doctor. Tata Ringberg was her name. And she had married a Norwegian medical doctor and when she was fairly young. She was a very beautiful woman and they went to east Africa where he worked. And it was a good experience but in those days -- she had a couple of babies, two boys, and then suddenly she realized that she wanted to be more than just a mom. And she had sort of an undergraduate degree, but she was interested in physiology and biology and so she went back to -- they went back to Norway and they got divorced. And I met both of them over there after they were divorced, and I got to know her pretty well and him as well and the two sons. And she brought one son with her and the other son stayed with him, her husband, former husband. And they were just terrific people. I mean they loved the -- Tata and her son, and he went to school here. At any rate, she was, as most Norwegians, was up on world events and we used to debate things. When I was doing these official exchanges with the Soviet Union under the Nixon/Brezhnev Detente Agreement -- Well, the Norwegians, they felt that was a good deal, you know. They wanted to see better relations between the U.S. and Russia. We'd been allies during the war, but under Stalin and then subsequent, they were so hard-nosed communist, and Americans got paranoia about communism and so there was a Cold War. And so it was a kind of breakthrough. And then I, as an ecologist working with mostly big ungulates, caribou and muskoxen and moose and mountain sheep, mountain goats, I was interested in their evolution, which that was mostly in Africa. So I figured Africa is where evolution of ungulates got started. And I was eager to get there because there had been so much good work going on

there. Biological, ecological, and behavioral. And so I made a connection at one international meeting in Scandinavia, I think, and asked about -- to some South Africans, I asked about possibility of joining up and doing some research through the Mammal Research Institute at the University of Pretoria, which was run by an Englishman but this was under the nationalistic government, apartheid. And so the people there were -- the faculty or biologists that were working there, were a mixture of both English-speaking and origins, as well as Afrikaans. No blacks. And then there were foreigners, like myself. There was an outstanding Israeli biologist, who was working with porcupines, the European porcupines. And then it was just a very stimulating environment but they organized -- got some funding from the South African Research National Science Foundation, something like that, to cover some salary for me and living expenses. Not much salary, but living expenses and I had to give a few talks. But it was mostly doing research with one of their biologists who was a specialist on stable isotopes. No, radioactive isotopes, tracers, but also physiology and water transfer and water relationships of ungulates. And that -- I was interested in how the ungulates dealt differently with water. And so I worked out a -- we worked out together that I wanted to compare two ungulate species that were somewhat similar. Impala was one that was a lot known about. And the blesbok was another, which was like a difference between a mule deer and a white tail deer in size. And one was a definite dry land area, the other one was more of a savannah, the impala. But they both go through this period of summer drought and then the rains and high quality forage, and then poor quality forage. And how do they do it? And so I was interested in, well, how did they this. And working with this physiologist, that was a good deal and he was a good guy. And I forget his name at the moment. We published together. And so, but at any rate going back to --

KAREN BREWSTER: Does this go back to these coffee breaks?

DAVID KLEIN: Yeah, back into the coffee break. Then I remember Tata was saying, "Well, how come you're going to South Africa? They've got this Afrikaans, this nationalist government that the blacks don't have a vote," etc., etc. I said, "It's science. It's science. And there's good scientists there and it's not political, and that's the same reason I went to the Soviet Union on an exchange. Yeah, there were these people I was working with were part of the Soviet Union but they were scientists, too." And I believed that. And I thought -- And so we had a long discussion and I, of course, won over on that one because she agreed eventually that that was it, but she liked to challenge these things.

KAREN BREWSTER: Now, you had mentioned that these coffee breaks were the research faculty. That the teaching faculty did not participate in these and why?

DAVID KLEIN: Well, early on they were separate, the institutes, the same with the Geophysics. They had research people, they didn't have -- if they were going to be teaching they had to have a split appointment with the teaching department. And Geophysics, they -- one or two had some kind of a split appointment to teach physics and things like that, but these were core courses and they weren't -- everything was on the -- in the institutes, was on the research.

KAREN BREWSTER: So you could be a faculty member at the Institute of Arctic Biology and do research and not teach?

DAVID KLEIN: Yeah, many of them -- but they had a base salary but they had to bring in -- they were expected to bring in research funding and some of their salary if they got big grants. So there was always real pressure on those that when a grant would run out and they would have to spend time trying to get a new grant, and, of course, there's no sure thing there. So the director's job was to try to encourage them and stimulate them and assist as possible, and maybe recommend that they team up with somebody else because they could both do a better proposal if they were working as a team. And that's one of the advantages of an institute. Yeah, and so they did some of that.

KAREN BREWSTER: I didn't realize that you could be a faculty member and not have teaching obligations. I thought all faculty had to teach.

DAVID KLEIN: No, it's changed markedly now.

KAREN BREWSTER: Okay.

DAVID KLEIN: And when it became --When they merged, they still maintained their identity but they merged it into a Division of Life Sciences.

KAREN BREWSTER: So the Institute and the Department of Biology got --

DAVID KLEIN: The faculty were merged into that. And so then faculty would have -- part of their salary would be paid for by teaching and that was usually state budget. And part of their faculty, part of their research time, would be paid from the research grants they were working on through the Institute of Arctic Biology. So that was to bring -- to make essentially them -- because there were these debates, of course, at all universities, especially at that time when this was going on at other universities, as well. The research faculty were sort of elitists because they had this money to pay for their research, they didn't have to teach, and then the people that were doing the teaching were underpaid compared to them.

KAREN BREWSTER: And they didn't have time to do research if they were doing all the teaching, right? Or did they do research?

DAVID KLEIN: They didn't have time to write proposals to do the research, that's right. And they had a heavy teaching load.

KAREN BREWSTER: And so the research faculty, they had graduate students, though? Even though they weren't teaching, they still mentored students?

DAVID KLEIN: No, I mean, there was this transition period of several years, eight or ten years at least, when, yeah, some of them would -- some research faculty would volunteer to spend some time teaching. Maybe they were encouraged because they were

running low on their research funding, but they were still doing research so they literally bought out of their --

KAREN BREWSTER: Right. But a research faculty could serve on graduate committees and have graduate students that they mentored even if they weren't teaching in a classroom?

DAVID KLEIN: They could, that's true.

KAREN BREWSTER: Okay.

DAVID KLEIN: Yeah.

KAREN BREWSTER: And did they?

DAVID KLEIN: But it didn't -- Yes, a few did but from their perspective they didn't get -- that took a lot of time.

KAREN BREWSTER: Oh. And that wasn't included in their grants to have time to do that?

DAVID KLEIN: Well, it depended on the grant. But it depended on policy at the National Science Foundation and how well you could -- if you could justify it. So it, yeah, it was -- the debate of whether you could have -- whether a person could be a good teacher without doing any research and vice versa, whether you could be a good researcher without doing some teaching. And in my view, most teachers, and I say most, that are doing a good job were doing some research, too, or at least had experience as research. But on the other hand, we had some outstanding researchers that didn't do any teaching and some outstanding teachers who didn't do any research. They loved teaching and they kept up on the latest research that was being done, but it wasn't hands on themselves. So it's like there's no perfect fit, no perfect -- and that's what I think is important in a university. You don't have strict rules that are going to force everyone into the same slot.

KAREN BREWSTER: Well, how did that work then with tenure, or was tenure not an issue back when it was separate?

DAVID KLEIN: At the beginning, there was no tenure for faculty, period. And so you were under some kind of a contract, and the same was true for the institutes. And they could -- maybe if you'd been there for a while you had a two-year contract. If you're new, you had a one-year contract. And if you're successful in bringing in more grant money and you're doing good research and well-funded, yeah, there wasn't any problem of getting a renewed contract. And same with teaching, if you were doing a good job at teaching. But in teaching, it got more political because it was -- budgets were smaller. And if the budgets got short, what do you do? I mean, you have to -- you don't fill a position if someone doesn't stay and so there's always a shortage. And it was terrible

under those conditions because you didn't have the academic freedom of speech. And that "Firecracker Boys" thing happened during that era. And the administration was too powerful, and the faculty in the university didn't have any power, technically. And they were just -- we got organized. And I played a role here, but I had to be very sensitive in playing that role, because the federal government -- I had bosses in the federal government who were technically responsible for me. I was employee of --

KAREN BREWSTER: You were a Fish and Wildlife Service employee.

DAVID KLEIN: But I also had a contract with the university, and there was no money involved, that made me a full faculty member. So the only -- there was no tenure for either -- in either programs, but the federal government had a merit system so they couldn't just arbitrarily fire you. It was something like tenure. And you had to go through review every three or four years, which was complex. It'd be something like a tenure review or advancement. And you did have to go through advancement from assistant professor to associate professor to full professor, and there were politics involved there. I mean, I got involved with the National Association of University Professors, which was really the only appeal source if you were, you know, summarily dismissed. Faculty and you're summarily dismissed, there was no place to go in the university system. And this was not uncommon for state universities at that time. We were a little slow up here, but not much.

KAREN BREWSTER: There wasn't a union?

DAVID KLEIN: There was no union, and there was no tenure, and no standardized review process for advancement. So who recommended you for advancement? It was your department head and the department head had to go through the dean. There wasn't necessarily a review by peers, and there was no sabbaticals.

KAREN BREWSTER: So you mentioned the department, so -- that the researchers were at the institute and then the teaching faculty were in the department. What department was it? Was it the Department of Biology?

DAVID KLEIN: Biology and Wildlife.

KAREN BREWSTER: That was one department, okay.

DAVID KLEIN: But at one time, there was a Department of Fisheries and Wildlife, I think, and then a Department of Biology. And that didn't make sense, but they were merged together later on. But it made some sense because they were applied biology, applied science.

KAREN BREWSTER: So is the department currently still the Department of Biology and Wildlife? Okay, they're still one.

DAVID KLEIN: Yeah, within the College of Natural Sciences.

KAREN BREWSTER: Right. And then that is still separate from the Institute of Arctic Biology?

DAVID KLEIN: No, then we used to --

KAREN BREWSTER: Because there isn't a Department of Life Sciences anymore is there? You mentioned that.

DAVID KLEIN: No.

KAREN BREWSTER: No, that went away?

DAVID KLEIN: That was a Division of Life Sciences.

KAREN BREWSTER: Oh, that was a Division.

DAVID KLEIN: And so that included Fisheries, and, too there was no Institute of Marine Science. And then the Wildlife Unit merged with -- there was pressure nationally with the Co-op Unit Program to merge fishery units with wildlife units.

KAREN BREWSTER: Right.

DAVID KLEIN: The Fishery Unit got started about -- must have been about '80. In the '80's, sometime. 1980's. Whereas the Wildlife Unit is 1950.

KAREN BREWSTER: Right.

DAVID KLEIN: So then we had --

KAREN BREWSTER: But then those two merged. I remember you said that before.

DAVID KLEIN: They didn't merge at first, they were independent or they were both cooperative units.

KAREN BREWSTER: Right.

DAVID KLEIN: But one was fisheries. And we worked together, the fishery unit guy and me at times. And we'd have an annual meeting where both were there at some place.

KAREN BREWSTER: And they -- the Fisheries Cooperative Unit approached things similarly to you, it was funding for graduate students through Fish and Wildlife?

DAVID KLEIN: And Department of Fish and Game. That was the Department of Sport Fisheries, primarily, but sometimes Commercial Fisheries, that provided support for the

Cooperative Fishery Unit. And it was Department of Wildlife, Division of Wildlife Conservation, that provided out of their budget the money for the Wildlife Unit.

KAREN BREWSTER: Right. But so, but on the federal level the Fisheries, was that Fish and Wildlife also?

DAVID KLEIN: Yeah, both with the Fish and Wildlife.

KAREN BREWSTER: Oh, okay.

DAVID KLEIN: Until -- until under the Reagan administration they, I think it was the Reagan administration, they tried to budget cut and they decided to take research components out of the federal management agencies, the Forest Service, the Park Service, BLM, and Fish and Wildlife Service, and put them all into one -- under the Department of -- the Geological Survey.

KAREN BREWSTER: [Chuckling]. Okay.

DAVID KLEIN: So the Geological Survey was another one. And they merged them all together and they put them under the Geological Survey. They could have put them under the Fish and Wildlife or the Park Service, but that seemed, at the time, was the best way to do it. And partly because the Geological Survey was not tied in with the applied management.

KAREN BREWSTER: Yeah, I was going to say, it has been always an agency that's more just research. They don't manage the resources.

DAVID KLEIN: Right.

KAREN BREWSTER: Where the other ones were doing both.

DAVID KLEIN: Yeah, so at any rate --

KAREN BREWSTER: Is that where the Biological Survey came in? Isn't there a National Biological Survey or something like that?

DAVID KLEIN: Yeah, that was before the -- when I first went to work as a unit leader, it was the Bureau of Sport Fisheries and Wildlife.

KAREN BREWSTER: In Fish and Wildlife Service?

DAVID KLEIN: Yeah, but it wasn't called the Fish and Wildlife Service, it was Biological Survey or something like that. And then the Fish and Wildlife Service came into reality after that.

KAREN BREWSTER: Okay.

DAVID KLEIN: By changing the name.

KAREN BREWSTER: But so we were talking though, about the Institute of Arctic Biology and the Department of Biology and Wildlife, they are now one entity?

DAVID KLEIN: No.

KAREN BREWSTER: Or they're separate?

DAVID KLEIN: We're a component within the Institute of Arctic Biology, and then we're tied also to the Department of Biology and Wildlife.

KAREN BREWSTER: The Cooperative Unit was, is that what you mean by "we"?

DAVID KLEIN: Yeah.

KAREN BREWSTER: You were connected to both? Okay.

DAVID KLEIN: And now with the Cooperative Fish and Wildlife Research Unit, the Alaska one, some of the faculty -- the faculty in Wildlife have appointments through the -- as faculty members through the Biology and Wildlife. But they're fully salaried by the Fish and Wildlife Service, or, no, by the Geological Survey now, yeah. And so the university doesn't kick in -- the university kicks in for the office, secretary, that kind of stuff. But under the Fisheries people, some of them, most of them are -- their connection is not with the -- they're mostly with the Biology and Wildlife, but some of them are with the Institute of Marine Science. And they have a teaching program, too, the School of Fisheries. And so they have their appointment there, but they're part of the Co-op Unit as well.

KAREN BREWSTER: But so the current Department of Biology and Wildlife is its own thing, it's not under IAB?

DAVID KLEIN: No.

KAREN BREWSTER: No, it's separate?

DAVID KLEIN: So they have separate budgets and one is directly through the university and the other is through the Institute of Arctic Biology. Well, it has to go through the dean's office. That would be the College of Natural Sciences for the Biology and Wildlife along with the Geology Department and Physics, etc.

KAREN BREWSTER: So it's still that the Institute of Arctic Biology still is a research institute which relies on grant funding? They don't get so much funding from the university, the teaching department gets more?

DAVID KLEIN: No, right, but their members are --

KAREN BREWSTER: They cross-pollinate.

DAVID KLEIN: Well, more than that. I mean, every member of the Institute of Arctic Biology has a teaching appointment through the college. They may be sometimes full research because then literally to do that they're buying out of --

KAREN BREWSTER: Right.

DAVID KLEIN: They don't get any salary for teaching.

KAREN BREWSTER: Right. So now it's more mixed? Before when you were talking about people either just did research or just taught, that was a previous time period. Now if you work at Institute of Arctic Biology, you do both research and teach.

DAVID KLEIN: Yeah, more or less.

KAREN BREWSTER: More or less, okay. Unless you buy it out through a grant.

DAVID KLEIN: Then there's a few people that have split appointments, like not necessarily through the Institute but they might. Somebody working with a museum like Derek Sikes, he also teaches occasional courses.

KAREN BREWSTER: Yeah, right.

DAVID KLEIN: And then there's several others.

KAREN BREWSTER: Right. That works for other parts, like at the museum, you do anthropology, you teach, and you also work -- That's standard.

DAVID KLEIN: Yeah.

KAREN BREWSTER: Okay, we kind of got off subject, but.

DAVID KLEIN: And then the budgeting for the department goes through -- down through the university system. And the Institute of Arctic Biology goes down through the university system, as well, but they have their own budget office. Whereas the department doesn't. The department head has to live within a budget, but he has to work closer with the dean's office, and mainly the dean's office, yeah.

KAREN BREWSTER: Yeah, it is a little confusing. Thank you for explaining that. We kind of got off topic.

DAVID KLEIN: The bigger they get -- The bigger they get, the more of that.

KAREN BREWSTER: Well, and also it's confusing because it changed from -- When you started, what faculty did and research and teaching and these different institutes and departments was a different relationship than what it is now.

DAVID KLEIN: That's right.

KAREN BREWSTER: That the Institute of Arctic Biology, wasn't even there was it when you started? It came later?

DAVID KLEIN: Not much later. I came there in '62. They probably started maybe a year or two earlier.

KAREN BREWSTER: Oh, I was thinking it wasn't there -- When I said when you came, I meant when you came as a graduate student.

DAVID KLEIN: Oh, not as a graduate student, no. The only institute then was the Geophysical Institute down in the old Chapman building.

KAREN BREWSTER: Right. Well anyway, I got us off topic because we were talking about these coffee group meetings and how -- you were talking about how --

DAVID KLEIN: They were nice.

KAREN BREWSTER: -- the camaraderie and the exchange of ideas.

DAVID KLEIN: And that -- Frequently when I was doing research in Denmark and at the University of Oslo on sabbatical, they had similar kind of coffee breaks that people would come to, and it was good. And especially for me as a visitor, it was good because it was part of it and it was less formal. And sometimes there, at the University of Oslo, the department head couldn't make it very often because he was busy being an administrator and didn't -- he had a lot more under his --

KAREN BREWSTER: Well, you said the same here, that the director didn't always make it to these coffee breaks. But you were in the position with head of the Cooperative Unit that --

DAVID KLEIN: There were times when I couldn't make it, too.

KAREN BREWSTER: No, but that you were sort of affiliated with both organizations so you could do the --

DAVID KLEIN: I was like a mini institute within an institute, yeah. In fact, I was -- that's the way the university administration saw me.

KAREN BREWSTER: You were an institute within an institute?

DAVID KLEIN: I was a director of an institute, but it was within the Institute of Arctic Biology. And so as a director of an institute, even though when I first started it was just me plus a secretary. That was it. But I was -- because it was an administrative unit that was semi-independent by the cooperative agreement that was designed to be that way, then I was expected to sit in on the director's meeting, director's and dean's meetings, which was good experience for me because I was pretty much the youngest one there. And also, technically, much less power than the others because they had a lot more faculty under them. But nevertheless, they treated me -- And at first, I thought this is just a formality but then I began to realize it was important that they recognize the existence of the unit because there was a lot of -- new people came in and it was hard to understand what the unit was. And I became convinced the value of the wildlife unit instilled -- I think it was and is a great concept, because it brings these different state and federal government together, plus the Wildlife Management Institute, which is just a private lobbying organization for hunting and fishing activities.

KAREN BREWSTER: And you say, you had the benefit of you could kind of play at all levels. You could be a dean/director because you were head of an institute. You also could interact with faculty, and you also could interact with students, so you kind of got to do all of it.

DAVID KLEIN: Well, that's true. And being so remote from Washington D.C. at the University of Alaska -- other unit leaders in other states closer, you know, Pennsylvania and other places, that I got to know from annual meetings and what, and we had a few exchanges. They envied it in some ways because I was less under the nose of the Fish and Wildlife Service. On the other hand, I knew that there was going to be closer scrutiny because what I was doing, by the federal government, but at the same time I believed in the whole concept of you were working for two bosses and the main reason we existed was to train at the graduate level young people for positions with state and federal agencies, or in other places. It was mostly state and federal agencies, which were the employers. And I thought this was a wonderful way to do it, because students would easily get exposure to both state and federal agencies and sometimes the agencies would be providing in-kind support with aircraft assistance, getting out in the field and what. And then the students were meeting these people, the biologists from the state and federal that were potential employers of them. And so it meant their employment was better assured if they did a good job in their degree.

KAREN BREWSTER: Well, I'm now responsible for getting us totally off topic of what we were going to talk about.

DAVID KLEIN: That's okay, it's all background, which is important.

KAREN BREWSTER: But so I'm going to pull us back around to something I have a note from a previous interview about. About modeling and the concept in science and biology in doing modeling versus I suppose doing fieldwork. Is that what you wanted to talk about when I -- Is that what my note means?

DAVID KLEIN: Let's do it because --

KAREN BREWSTER: This ties into --

DAVID KLEIN: I don't remember the date but probably back in the early '90's there began to be this focus on modeling because ecological and biological systems were understood to be horribly complex. And we were getting better at getting data from these variables because of new technologies like radio collars, so we can monitor movements of animals and then get information on life history and behavior and how that affected land uses where the animals -- which was the animal's habitat, whether it was forestry or agriculture, or what. And there were one or two eager beaver young scientists, biologists, working with wildlife that jumped into the modeling. One of the reasons maybe why I was skeptical about modeling early on was because I was never very strong in statistics and modeling. It required a pretty high level of understanding of computer modeling. This was all computer modeling. But the concept of modeling was dependent upon the computer to integrate information that could be better understood if it was put into a model. And you knew how much input each component of the model played, and to make the model work better you had to get more data. But early on they were mostly just conceptual models. Well, that part of it I thought was okay. because you had to look at a complex system and not simplify it to just working on components, which seemed to be important like hunter/harvest versus population dynamics. It's not enough. You've got to factor in other things, disease, weather, predation, what have you.

KAREN BREWSTER: Well, isn't the quality of the output of a model only as good as the input of the data you have?

DAVID KLEIN: Yeah, definitely, that's the case. But on the other hand -- so the models -- the big problem with modeling becoming popular was that models were expected to serve two functions. The first was to better understand the system. That meant you built a model and you put different boxes -- if you did a graphic model you had these different boxes as input into the target species for a population. And that included habitat quality and grazing pressure and then predation and you have extreme conditions like winter and how did that change the physiological demands of the animal, and how did you -- you had to plug in the physiological changes in relationship to reproduction and especially bearing young and lactation, and relate that to the food supply and the quality. It gets pretty complex, but that's the real world. And if you're going to understand it, you should better understand than if you just do this on a piecemeal basis. You just focus on one or two relationships, which was the way you used to do it.

KAREN BREWSTER: So what was the second function of modeling? You said it had two functions?

DAVID KLEIN: Well, the other function is why did you -- what was your long- term goal? Was it to be able to use the model and predict what would happen if the variables changed, like if the climate changed, or there was a big fire, for example, on the range of the moose, or caribou or whatever? What happens if you had a disease outbreak and how

did the animals respond, the surviving ones respond? For managing, say harvest of them, and understanding population dynamics, you know it sounds great to a model that you do this. The problem is once you build a model and you put a lot of effort into getting data, if you don't have data that you should have, you say well, it's probably not important so you don't include it. So some of the variables that maybe you just -- the best thing is to say that it's not an important variable. And you can do some statistical analysis if you have data that helps you make that judgment, but it's not reliable because you didn't have any data to work with in that particular variable. It's like insect harassment of caribou. It was just so hard to get any data and yet we knew it was important. Well, how important in terms of say, blood loss to mosquitoes and to parasitic flies, and harassment where they can't feed normally, and how does this relate to changing weather conditions?

KAREN BREWSTER: Yeah, you sort of end biasing the model based on if you have data or not. As you say, if you don't have the data, oh, it must not be important.

DAVID KLEIN: It's an incomplete model.

KAREN BREWSTER: Yeah, so you're biasing your outcomes.

DAVID KLEIN: Yeah, definitely. Well, that's true, and it's always going to be true, because it's not going to be exactly the same as the real world.

KAREN BREWSTER: Right.

DAVID KLEIN: But your goal was to try to get as close to the real world as possible. Well, of course, some of the complications are that how much is it -- you've got a limited budget, what's the most important data that you got to get and where should -- you should put your money there obviously. But you have to make an arbitrary judgment as to what's important. And as human beings if you -- you're probably more interested in the behavior of caribou under certain stresses and what do they do versus what are the stresses, versus insects, for example, where you'd much rather work observing behavior of caribou than trying to observe the behavior of the insects.

KAREN BREWSTER: Well, the other thing I was thinking, too, when you just said that was the politics at the time. I was thinking about oil development in Prudhoe Bay. When you talk about insect harassment, that's what I think of.

DAVID KLEIN: Right.

KAREN BREWSTER: And the priorities of trying to figure out what might happen as the result of some particular development activity, which may or may not be the most important thing for understanding a particular population.

DAVID KLEIN: Well, some cases -- at the oil industries could say, challenge the biologists, Fish and Game or Fish and Wildlife, whoever's involved, to say we want to build a road between Prudhoe Bay and Kuparuk field, but we want to have the minimal

impact on wildlife. Well, then that's a challenge that we should respond to as biologists for those agencies. And we sometimes were able to do that. Well, you don't need a model for that. You need data on movements of animals and how it might change with a road or pipeline, gathering pipeline with the road versus separate from the road. So there were a lot of things that you could test in the field, and learn from that. But you could also -- What was done on the way to build, say a work camp or a permanent work place for the workers, where would you want it? Well, you want it -- oil industry wants it where it's most efficient for them, but there could be quite a few places. But if they put them say, between two lakes and that's that corridor between the two lakes is where the caribou use to get to the coast. You can see those trails from the air. So by aerial reconnaissance we were able to -- one of my students was able to map out, and it didn't take very long, and provided it to the oil industry and they said, "This is terrific. Yeah, we can move to this other place. We don't want to stop the movement of the caribou." And it didn't cost them greatly to do this beforehand.

KAREN: So what you're saying is, though, there are times when a model can be useful and important, and other times you don't need a model, you can just do data collection?

DAVID KLEIN: A model would be more important in why is the population going up or down or stable? What are these variables, what are their influences? How important is insect harassment in the summer overall? Well, you've got to have data on how many days they're influenced and how many hours a day they can't forage properly, how much energy is expended in trying to -- grouping together and moving, versus separate, they're running around to get rid of the mosquitoes so they go together and that reduces the harassment per group. They can't feed when they're grouped together and then they want to move to the coast and if they can't get there because of traffic on the road, so that's where a model works well. But then you've got -- for the population dynamics over time, you've got the whole ecosystem that you should be thinking of, because what about the predators? Do you know what the population levels are and how they're fluctuating with regard to the population of the target species? The caribou, in that case, and the bears. And how the bears -- they don't get along in the oil field very well because they get in trouble and so we reduce them, move them out. Well, was that a factor? Yeah, it was a factor in allowing the caribou to -- decrease the predation level on the new young born caribou. And we were a long way from the mountains and wolves don't do well year round out there in the flats, so they like to be in the mountains where there's other prey like sheep and moose in addition to the caribou and the caribou are only seasonally there. So then you could -- you have justification for all ecosystem level modeling, but the tendency for biologists to work primarily with one species and so they don't want to mess with whole ecosystems. When you start asking questions about oil development in NPRA (National Petroleum Reserve-Alaska) that you need ecosystem models. And a lot of that input, it comes from satellite imagery on what the habitat quality is at different times of year in different places. Is it high-centered polygons or is it hills? Does it have high ratio of dwarf willow to tussock grasses, sedges? And all of these things. And then you put quality value at different seasons for each of those components. So then you get a model like that and they did a pretty good job. The best model was the Porcupine Herd. And that was because of this D2 Legislation, which said we need more information on -- to allow

more seismic exploration for oil, but also what are the potential consequences we need to know about the fish and wildlife populations and how they might be affected?

KAREN BREWSTER: And also, now-a-days, modeling seems to be used quite a lot when you're dealing with these issues of climate change.

DAVID KLEIN: Yeah, that's a good example.

KAREN BREWSTER: And the complex system of, well, okay what happens -- where are all these variables -- so what happens if we change what's happening, 'cause now there's going to be less sea ice and how that affects? Or the temperature's going to go up and what that's going to do to the forest fire rate, and things like that? That kind of modeling I can kind of see, but I'm not sure modeling biological species.

DAVID KLEIN: No, I mean, modeling components of ecosystems and the species components. It's like if you want -- models are used in say, human health. I mean, you've got to have all this information about your body. And with computers you can plug that in, whereas one doctor who's worked for years he's got a lot of that up there, but then someone comes in and doesn't quite fit. If he has a model, or she has a model, the computers now can help with the diagnosis. And that makes sense. And we use models, we've always used models. I mean, it's sort of like when you're building a house, you have a plan. And if you stick to the plan, you usually end up with something that's pretty close to what you wanted. But you see that it was short in some things because you didn't put things in that should have been in there at the time. So, I mean, we use models, and so I've some -- subsequently, appreciated the value of models but it's just like computers, computers aren't going to solve our problems. We have to use computers to help us solve our problems. It's a tool and the models are tools, and you've got to know their limitations if you're going to use them. And the problem is that good modelers are doing a terrific job, but then when you -- the member of Congress or legislature or something wants to know, "Well, you're doing modeling, what's going to happen?" Well, that's a predictive model, and models are not very reliable for prediction because there's these variables, we don't have enough. The irony of this modeling something for effect of climate change, when climate change itself is a model. So we don't know what the future holds in store. We used to have a pretty good idea that the weather would be similar to what it's been for the last ten years, but now they've got models.

KAREN BREWSTER: Well, but isn't the idea of a model is you can plug in a different number for the temperature and see what happens?

DAVID KLEIN: Yeah, if you've got those temperatures. But then the big problem with the modeling now is the climate modelers say, "We can't predict what's going happen locally, because we need regional models." Especially when you've got variables, which they don't have data to deal with like, what about the mountains that are interfering with the wind? And mountains in the Arctic that interfere with the cold influence from the frozen ice, if you're inland, on the inland side of those mountains, it's much more --

KAREN BREWSTER: ‘Cause they just don’t have the data?

DAVID KLEIN: We don’t have the -- they’re putting out more of these remote --

KAREN BREWSTER: Right.

DAVID KLEIN: -- climate recording devices and it’s improving all the time, but still when you realize say, in the Lower 48 where you have so much climate data within a state that’s just the fraction of the size of Alaska. And we don’t have communities and villages in all these places, so it has to be some kind of remote system, which is pretty expensive to put out there. And they’re not totally immune to freezing up and blown over or chewed up by a bear or something.

KAREN BREWSTER: Well, it’s interesting though, you say that models are not very reliable as predictive things. Can you explain that, because I think of a model as exactly that’s what it is? It’s to try and predict what could happen, so can you explain that?

DAVID KLEIN: No, a model -- the value of a model is it helps us to understand the complexity, but it doesn’t provide the detailed information to use it as a predictor of the future. So we can say, if things change the way we think it’s going to change, but that’s all speculation, too. I mean, look what happens, we had this unusual spring, and we have an unusual winter. The models -- The climate models are mostly focusing on temperature. And the climate modelers say when it comes to precipitation, we’re kind of at a loss because when -- we can’t model cloud cover with regard to precipitation. It’s like we had a lot of cloudy weather last winter, and we didn’t have very much snow. And this early winter, we’re not having a lot of cloudy weather and we’re not having much snow also.

KAREN BREWSTER: Right.

DAVID KLEIN: And back in the old days when it got cloudy, it got warmer and snowed.

KAREN BREWSTER: Right. So if models are not meant as predictors of the future, why do people use them?

DAVID KLEIN: They help us understand the systems.

KAREN BREWSTER: Okay. So how --

DAVID KLEIN: That’s -- their educational role for us, is the primarily value of models. The problem is it’s tempting, even for the modelers, but for people that don’t understand models, they think models are -- let’s model something and determine what the future’s going to be. It’s not. We’re dealing with the past, the information from the past and when everything is changing in relationship to weather, it doesn’t work. The animals -- we can make models for the animals but then -- and if we do a good job with the vegetation and

everything, then we might be able to say, "Well, if the weather is as it was for the last five years and doesn't vary too highly from it, this is what is likely to happen." But then there's these unknowns. No matter how hard we try, we'd find, oh, there's this God damn new disease we didn't even know it was there and we discovered it. And it couldn't have been too important in the past, but is it going to be important now just because the climate is changing? Yeah, it might be. Those are the problems with modeling. That's some of the problems. But the worst problem is that the funding agencies are dependent upon support from Congress or state legislatures and they need to move ahead. So they frequently use incomplete models, and then if it doesn't turn out the way the incomplete model predicted it, then the public loses faith in the scientist, even though they may have warned or cautioned that this is the model we have, but it's not too reliable. And it's the same place with doctors making diagnoses and then a second diagnosis so it's more complex where they have more facilities to do it. You know, the first one wasn't right.

KAREN BREWSTER: Or it's like the media who predicts the outcome of an election and then it doesn't come out that way when the count comes in.

DAVID KLEIN: Exactly.

KAREN BREWSTER: But I was wondering with models, you know, where you sort of said, it's tempting to use them in this predictive way. I was wondering, yeah, how is it that they're not supposed to be used as predictors, but our culture is now so focused on using them that way, how did that happen?

DAVID KLEIN: Well, this one -- last project that was a big modeling project I was involved with, was the one based on the Porcupine Herd. And this was funding -- I was involved in this mainly as an advisor, sort of a senior scientist as an advisor because I wasn't in a position to be an active person getting -- I was retired and getting paid to be in the field, and to collect data, and put the model together. So they had top notch modelers. The guy originally from South Africa, a young guy who worked with a real star in environmental modeling from the University of Minnesota, I think. And he came up here, and both of them -- And then they were modeling caribou, the Porcupine Herd, in relationship to the Native people that were dependent on it. So there was a sociological study that would need data to go into the model, too. And some of that data could be -- what the Native people were interested in the model because we had good data, pretty good data, on the caribou and the numbers, their distribution, the use of habitats, and the physiological condition, and all of these things that were getting better all the time. And then -- but then what happened if they decided mostly to winter in Porcupine, or in the -- yeah, upper Porcupine versus lower Arctic Village, for example, versus Old Crow. Well, they -- what kind of -- the model was interactive, which was a great way to go so that you could take it into the schools and here's a model, and now plug in -- raise the temperature during the summer. You could plug that in and bingo the thing would zip out and it was not only interactive but they did a good job with showing groups of caribou moving across the maps in relationship to going to the calving ground, and how snow cover -- if you manipulated snow cover, how it would affect the timing of their arrival there. This was terrific, because it convinced the local people that -- They already knew a lot of this

but they could see that they're all interacting, all these things are interacting. And it's a very complex system, but just because it's complex you shouldn't ignore it. And you shouldn't just say, "Well, last year it did this, it'll probably do the same thing this year, etc." And then you have these extreme events, which the climate models predict. Every once in a while you have an extreme -- Well,this is happening with snow now in the central part of the United States. And, well, now they know more about why it's happening, but the climate models were predicting increased extreme events. But that could be increased drought, or increased flooding. And this is, in terms of people, this is important information but it doesn't help too much if you can't say when they're going to occur. And that's what the modeler said, "We can't predict their frequency. Well, there're going to be extreme events and they're going to be more extreme than they have in the past. Like hurricanes are going to be more extreme and -- and -- but not necessarily more common." And it has to be plugged into the temperature of the sea where they generate in order to know whether they're going to materialize but then whether they're going to be a Sandy disaster and flood New York City or not, they can't predict that. And we even have trouble once it's already headed in that direction to know specifically because there's all these various variables in the weather. And so the same applies really to the models. But at any rate, the nice thing about that Porcupine caribou model was that they use it in the schools in Arctic Village and Old Crow and the school kids just loved it. And they realized -- they learned a hell of a lot. And then you could take that to Washington D.C. and talk to members of Congress. Maybe there were some that weren't capable, an occasional representative from Alaska, and seeing it all. But when they saw this and then you say -- and the kids were able to show that such and such was such and such, and you can do it, too, then they began to see, yeah, and that means the Natives know more about it. We already knew they knew a hell of a lot, but now they know more and they're using -- they're able to relate that to models. And then they see the relationship there where this -- of course, the Old Crow people didn't have, and the Arctic Village didn't have data or experience in the calving grounds. Well, it's all in there in the model. And they had good people here. Brad Griffith and others who were really competent people and worked on this. They weren't necessarily competent people in explaining things to the Native people, so that it took sociologists or anthropologists, or at least people with that kind of experience to go there. And then the big sad thing was -- there had been a lot of money gone into this and they had real pride in it, and so they want to publish, of course. But the deal was that Native people would only go into if they said, "Well, wait a second, if you're going to use it, publish it, it's going to have political influence. We want more control on whether it's going to be published in a way that it will be maybe hurtful to us because people might not understand the other complexities of their cultural relationship that wasn't, say, in the model." And what they really wanted -- they have these options that you could, in the interactive one, which some of them were really pretty complex, but they at least showed, you know, did they want more tourism? Did they want roads into the villages? If those roads were going to interfere in the movement of the animals and make them less available, did they want that? What about some development if it could be controlled and the impact would not eliminate the Porcupine Herd but maybe reduce it somewhat? And, well, the oil industry liked that kind of approach. And so the only problem was then the caribou wouldn't have to migrate so far and they wouldn't be available for the people in the villages. And so this was helping people to stop expecting

the impossible, whether they're oil people or the biologists doing the studies or the media, or politicians. So that's -- that was -- that model has done a lot of good. And it's surprising when I was over in -- because I was involved in that and it wasn't -- portions of it were published, finally. But the first ones were shut down by the Native community. And it was hard to take, but that was the agreement, otherwise the Natives wouldn't have participated in the social science aspect of it and that makes sense. But then it turned out, yeah, it could be used with some qualifications, and then it was okay.

KAREN BREWSTER: But it's interesting that models can be used to -- just like any facts, they can be used one way or the other to prove a point.

DAVID KLEIN: Yeah.

KAREN BREWSTER: And the Natives were concerned about that.

DAVID KLEIN: Because the interacting one, you can alter one of these variables.

KAREN BREWSTER: Right.

DAVID KLEIN: And then it only takes a fraction of a few minutes to -- model, to give you a feedback. And that's good so you can kind of play games with it. And then the kids doing that, they get so that, yeah, that's not gonna -- we know what's going to happen if you do this. And then the adults get into it, and you can relate things and even it included where do you want -- You need some cash income in the community, if you want it from tourism and what are the costs if you have tourism.

KAREN BREWSTER: Right, so --

DAVID KLEIN: And what kind of tourism, etc., etc.

KAREN BREWSTER: So models can be good and bad it sounds like?

DAVID KLEIN: Definitely, yeah. But it's a tool. It's like a computer is a tool. And, yeah, you can do -- you know, if you're really good with a computer you can make things look good when they're not really good. [chuckling] And vice versa.

KAREN BREWSTER: Right. Well, you also kind of said that your views on modeling have changed. Like originally, when it first started, very much against them. Now that's changed?

DAVID KLEIN: No, I was more -- I wasn't very much against them, I was very skeptical, let's put it that way. And that was because I was mainly concerned that people would be seduced into thinking they were good predictors and they weren't. They were good to help us learn. And that -- I think we have learned a lot through the use of models. And certainly I've learned that they can be used to help people learn. And especially

young people with their minds open in schools. And that's the future of the world I think, anyway.

KAREN BREWSTER: Young kids.

DAVID KLEIN: You're not going to change the minds of politicians, if you -- that they say, "Oh, we don't like that. We don't like the outcome of that, so we don't like the model." That kind of thing.

KAREN BREWSTER: Now are there other things --

DAVID KLEIN: By the way I -- I wrote this poem once about models.

KAREN BREWSTER: Oh yeah.

DAVID KLEIN: Which would be a good one in there. I don't remember it in detail, but it was at a conference that had to do with animal physiology, and it was in Colorado at Fort Collins and the university there. And this guy, I forgot his name, but his name was sort of synonymous with modelers and there was a big focus at one session on modeling that he was trying to sell it on. And he was a nice guy, I mean. And the nice thing about these people I worked with, most of them have a good sense of humor. You could kid one another. So I -- they made -- since I was sort of the senior biologist there with animal ecology and populations in physiology working mainly the physiology part with Bob White and others, they asked me to do a summary at the end, the last day. And I don't think those things because it's almost impossible. If you're there, I'm going to get something different than you are out of it. And if you have to do a summary, you approach it altogether different, and it's on your shoulders. And so, shit, I don't want to do this. So then I started taking notes and then I started doing some rhyme and stuff. So then I did the summary in rhyme. And it was joking about a whole bunch of things, including the modeling. And so in doing it, I refreshed the memory of everybody about these sessions, but I didn't draw any conclusions. You know, it was just -- And sort of the concluding one was on modeling. And it went over big. They printed it up and the "Coda" [sp?] I think they called it, the whole thing, they thought that was great. And I did that again once when they had a mammalogical society here. And Terry Bowyer -- I was just -- had, I think, just retired. And Terry Bowyer was -- and I were co-local coordinators for it, getting it going. And so we got a little bit more exposure than -- this was a national one so that there were other people that played a major role in getting it going. So then Terry asked me to do another one, summary, and I did that. And that was -- was that published in the *American Journal of Mammalogy*? I think it was. When they had a summary of that meeting, I think they published that.

KAREN BREWSTER: And that was also in rhyme?

DAVID KLEIN: Yeah.

[Karen chuckling]

DAVID KLEIN: Yeah. But it was the things that were fun about the conference that --

KAREN BREWSTER: Yeah.

DAVID KLEIN: But there were a few old timers that didn't see the humor in it. I mean --

KAREN BREWSTER: You have to have humor.

DAVID KLEIN: You'd been to all these technical papers and that's great. And most of them were published. And there were presentations were made and that was wonderful, but to repeat all that stuff.

KAREN BREWSTER: You have to have some humor.

DAVID KLEIN: Right, that's why I believe it's important in the world. Yeah, that's important.

KAREN BREWSTER: Well, this modeling and the emphasis on modeling seems to me a change that's happened in science in general. It sounds like in wildlife and biology --

DAVID KLEIN: And it's tied to the availability of good computers and especially laptops and stuff. And it's amazing how wonderful it is that we can make use of the computers and then the modeling can be possible. Whereas we used graphic models and I used them a lot. And giving a paper or something you could draw these boxes and show the arrows. And especially for animal physiology, they're really good for that. And if you're trying to show -- I mean, there was a tendency, you know, in the old days, is you show the data you got here and you show the data you got here and you show the data you got here and you try to present that to the audience. And even with bar graphs, you lose the focus. People just turn off when -- why not show these boxes and arrows going from one to the other, and maybe you don't have the hard data there, but you have enough data to back up each one. And it's a model, it's a graphic model, and that's the way we think, so let's do things the way we think because otherwise people go to sleep in the audience more rapidly.

KAREN BREWSTER: Well, I was wondering if it's changed how people are doing biology? I've heard other scientists or biologists criticize to say that people aren't doing fieldwork, they're now just doing modeling. Do you feel that way?

DAVID KLEIN: Yeah, but I don't blame it on models. I blame it on this remote sensing, and, you know, like radio collaring and things like that.

KAREN BREWSTER: So there's less fieldwork going on because people are using radio collars and remote sensing, so they don't have to be out there observing?

DAVID KLEIN: And especially where you're using remote sensing. And, I mean, the quality of this satellite imagery is so improved. I mean, it's unbelievable that they're now able to use it to actually count whales in the ocean, because a mass of a whale is huge and when they're up close to the surface then you can see a difference in the temperature right there where they are from their body. And so now you can get much more accurate information on the number of whales in different parts of the ocean at different times because satellites are going over there all the time, overhead. And you can't afford to fly out there and look. That's the way remote sensing started, you know, with high altitude flying, and you don't need to do that and it's too costly. So we can get all this information and then you have a -- yeah you've got to pay for the satellite stuff but when you realize when -- if you've flown airplanes there, oh it's a fraction, it's so low, the cost. And to get satellite collars on animals that are not too disruptive, and now they've got these little things and they're plotting movements of birds, for example. Like a little shorebird that flies one-stop from breeding grounds in the Arctic to Australia.

KAREN BREWSTER: Wow.

DAVID KLEIN: And lands in the same spot each time, or it stops on the beach -- stops somewhere, probably presumably on the beach, and stays close to Japan or something, and goes down there. And you never could get that information by being out in the field. But you should be out in the field because you want to know more about the animals, and especially their interaction with the environment and their food. You can't do it that way. And you can get information in the field without killing animals and looking at their guts. And now you can go out in the field and you get feces and you can do tremendous things when you get DNA that tells you the kind of plants they're eating. It costs something, but to mount an expedition -- You know, the DNA, it's genetic information, it's so valuable and we've got the techniques now to isolate what's in the gut and see what animals were eating. And if you find a, say, a mammoth that's frozen and coming out, and you can look at what's in the gut or in the feces. Well, the early humans now, they've actually got DNA out of shit in the caves. It's about 10,000 years old.

KAREN BREWSTER: Wow.

DAVID KLEIN: And they can get -- You can get DNA from the host out of it versus how do you separate it? Well, it's separated in the lab because you use some kind of something that's close to it in a lonely look at -- so you use modern human's feces or DNA to pick that out of the feces. But for the food that they're eating, well, you put in plants that are similar but they don't have to be the same, but then all the other ones that are similar to that pop out. And, yeah, it ain't that simple, but the process is understandable as long as you can do this DNA work. And there's so many amazing things that answer questions that we couldn't answer before but we can answer with new technology. But I think the DNA is one of the most important ones for any kind of biological work.

KAREN BREWSTER: So do you think students are missing out by not doing fieldwork the way you got to do it?

DAVID KLEIN: I do. Not only students, the biologists. I mean, if you're out in the field, you can see things and you see animals doing things that aren't showing up from remote sensing. And so, yeah, remote sensing is wonderful and especially plotting habitat changes, but you should be on the ground to ground-truth it so you understand what you're seeing. And it was like -- what was it? Was it this seminar this afternoon, maybe? I can't recall. But I raised the question -- it might have been at another one, but -- well, did we know -- oh, that was fire. Yeah, it was this --Yeah, you can do a lot with remote sensing on fire, and we've been improving capabilities and you can't be everywhere. But you've got to do enough -- be on the ground enough so that you can be sure what you're seeing remotely versus what is actually there. Because there are options. And like, oh, the good one is like caribou habitat and it was -- that's right it was on the burn, too. You get different responses in relationship to the severity of the burn. And you get different -- and Teresa (Hollingsworth) pointed out this -- it was that when you get into -- the difference between the wetland areas versus uplands areas, and she had students working on these different aspects. And the difference if a severe burn in an upland site is quite different than a lowland site. And then the big question was -- yeah, that was it. She was pointing out that it was water was -- and the wetland and if it was up on a slope and the permafrost underneath and then you had a fire, then you could get sedges coming in. Whereas, if it was drier, you've got grasses coming in. Well, yeah, this fits with my understanding of grasses are more drier -- well drained sites. But then the question is, well, the fire causes -- the increase the depth of the active layer, which means right afterwards there's more moisture. But then moisture drains out in subsequent years faster if there's no frost.

KAREN BREWSTER: So fire is changing where wetland versus dry may be?

DAVID KLEIN: Not only that, but if the water -- what's the duration of availablility of moisture for plant growth. Is it just the first few weeks after a melt off, if it's an upland site and it's well drained? And then the plant -- grasses, can do well and grow vigorously and then they siness[sp? @1:31:19]. Whereas sedges need more water to keep going, and it takes them longer so they need a longer duration of water, even though it might have been the same amount of water but it was available over a longer period of time. So it's another complexity that you have to factor in, but what the studies are doing is they're trying to answer those questions.

KAREN BREWSTER: I should say it was Teresa Hollingsworth who gave that lecture you're talking about today.

DAVID KLEIN: Yeah. Well she was -- some of those were students that were working with her, but she set them up.

KAREN BREWSTER: But you, yeah, okay. So we've covered modeling?

DAVID KLEIN: Enough for now.

KAREN BREWSTER: Do you have anything more to say?

DAVID KLEIN: It's too complex to give it any more.

KAREN BREWSTER: We won't give it any more coverage. We shall move on. One of the things I've wanted to talk about, we've done it a little bit, but a little bit more, is, you know, you obviously have a belief in the value of conservation and preserving wild places. And you've taken that value and applied it, not only in the science you've done, but in environmental work, right? Can you talk about the application on the environmental side? We've done a lot of talking about the science side. What kind of things did you do in the environmental work?

DAVID KLEIN: Okay, but first I'll make one statement that should introduce that. I love life. So living systems, biological systems that are alive, I've got a bias, you know, versus non-living systems. Yet, you know, this paper I'm giving is I've become fascinated about the geological history of these Bering Sea Islands --

KAREN BREWSTER: St. Matthew?

DAVID KLEIN: Yeah. How it relates to the -- the geological history relates very much to where the seabirds are nesting. And the summary statement is, in terms of coastal erosion, is the harder the rocks that's where the -- the hardest rocks are where the cliff nesting, the murres and kittiwakes, mainly those two but also quite a few others. But they're cliff nesters, ledge nesters on cliff. And those cliffs are the hardest and the sea is just -- the sea level's rising, you've got more early winter storms. And they don't erode. And so they're not being threatened. And, of course, they're up higher than the splash, and they're gone anyway by that --

KAREN BREWSTER: So this is the paper you're preparing to give in Salem, Oregon?

DAVID KLEIN: Yeah.

KAREN BREWSTER: Okay.

DAVID KLEIN: Coastal erosion is one of -- but then the auklets, the little, cute little auklets, they had a different strategy for selection of nest sites. Their nesting habitat is they're crevice nesters. They get onto rocks and boulders that the foxes can't dig into. But they have to come out of those to go out of these rocky deals to go to sea and feed. And they do this in mass and then they feed in mass. Like there'll be like 40,000 in one deal. So they literally swamp the foxes. So one fox goes out there, and the red foxes, yeah, so -- It's two fold this paper is on the red foxes displacing the Arctic's. But the red foxes are -- they're very territorial. Much more so than the Arctic's around the maternal dens. The Arctic's are, too, but they're -- it's not as big a territory. So you can have around an auklet colony with say 50,000 auklets there, breeding pairs not counting the young, and they go there and it's timing of the day that they come out. And when they come out, these little auklets sit on the rocks and chirp. And that stimulates all the others

to come out at the same time and then they fly out in mass, and it's a big flock. You know, it darkens the sky almost and they're gone. And they come back in mass, and then they go back in fairly fast. But when they're coming out, they're sitting ducks for the foxes.

KAREN BREWSTER: They're sitting auklets, not sitting ducks.

DAVID KLEIN: Yeah, that's right. And so a fox, you know, they love these auklets because -- and they've got young back in the den. The male and the female are both doing this, and taking turns. And we see them coming back, and they've got like six auklets hanging out of their mouths.

KAREN BREWSTER: In their mouths, wow.

DAVID KLEIN: And you figure, wow, man, they're pretty vulnerable. But when you have 50,000 or 40,000 of them coming out at the same time, they're swamping the predator because there's only time for them to make one trip back to the den, which was not too far away, but they -- further away, they want to control this and keep the other foxes from getting into this nice feeding area. In the meantime, you know, if they go out and come back with voles hanging out. They much prefer voles to birds normally, but the auklets, both the Arctic and --

KAREN BREWSTER: It's too tempting.

DAVID KLEIN: It's tempting, and just ideal size. If they kill -- if an Arctic kills a murre, which they will before they lay eggs or when they're just coming back, they occasionally one gets them. They climb -- they're better climbers than the reds. You know that's a big thing. They have to eat some of it there and then if they already have pups they have to carry this big cumbersome thing back. And the pups love to play with the wings and things like that, but you realize that they have a -- the foxes have a preference, but they also have to produce young, etc., etc., etc., and so do the birds. And so the net effect is -- Oh, and these auklet colonies are caused by coastal erosion that has causes these slumps. Where does it occur? Where the rock is -- if it is rock, it's all -- whatever's there is -- where that happens is underneath maybe a thin layer of lava that's only this thick.

KAREN BREWSTER: Four feet.

DAVID KLEIN: But this is explosive erosion. It has to be very close to where volcanoes were. There's one that was a big giant volcano up there, I'm convinced. But then there were small craters that were about two miles across, relatively small. And surprisingly, I mean, there's geology there. I'll show you the whole thing sometime in the future. But, we got a satellite imagery and I had aerial photos from the Navy at 6,000 feet, black and white, that were very valuable because they showed -- you could use those when it so foggy and it's hard to hike through the country without getting close to cliffs. But the satellite imagery is -- and they got this -- they started trying to collect them from St.

Matthew in 2008. They got one little bit of Hall Island and then 2009 they got this one that's just a beautiful one, and then they got other ones. But the reason this is beautiful is the sea. Well, you can see the green vegetation. You can see this crater, which I had speculated, but not at first. It wasn't until after we'd been there in 2005 and I'd had those photos from the first time I went out there in 1957. I speculated that these were craters, but Dan Mann looked at them, he didn't see them as such. He saw a lot of other things. And he used a stereo [?] and I didn't use a stereo [?]. We had serial [?] images and they were very valuable, but it's all black and white. So you could see some things. You could see this slump so well that it's coastal erosion, but it was that -- that and a couple others around the island were observed by the people, first explorers that got there in 18 -- early 1800's. They commented on this jumbled tumble of rocks that was going down to the sea. But this satellite image shows this deal. And then sea was calm at the time they did this and you can see this ash is leaching out of the -- And you can see where all of these, in certain places around the island, that's where this pyroclastic ash. In other places, it's just basalt and real hard stuff on these cliffs and stuff. So it's all -- and the birds, of course, selected these locations. Coastal erosion there for the auklets, it's actually there's some active slumps now. We spotted those with the satellite imagery. Only one place where we saw it. Well, it was bulged going out into the sea, a fan, all tumbled rocks. And that one has been there for five or six years. No, seven or eight. And these auklets are starting to nest in it. So coastal erosion for the auklets is not creating a problem nor is it for the others. But the islands, they're getting smaller because they are eroding. So if you're looking at it from geological time and thousands of years, yeah, they're getting smaller and eventually they will be lost. But at the present time, no.

KAREN BREWSTER: Well, it's fun to hear you talk about this, but it's fun to sit here and see you talk about it. I can hear and see the excitement that you get when you're into a topic like this and figuring it out. And there's the scientist in you. So it's really cool that, you know, even now, you know, Professor Emeritus, retired, that you still get excited like a little kid.

DAVID KLEIN: I've always been -- This detective work, that's what the reindeer study I did out there was the same thing. A detective work. And that -- a lot of nature study is that. And we used to -- you know, that's the advantage of being sort of a naturalist and going out in the old days. People would go out there and get familiar with it and then they would try to explain things. Well, we didn't have any other information. Well, they frequently were pretty close to being right, or sometimes they were absolutely right. And then when science came along, some of these same naturalists became scientists like the Murie brothers (Adolph and Olaus). And, man, they were so much better scientists because of the being on the ground and observing things. And handicapped in many ways compared to the world today, but it still is so damned important. And it's like, you know, I've been learning so much while I'm sitting here working on this computer and the birds are coming to the feeder and there's some suet out there. And I see so many things about bird behavior, and then I look and there's voles out there feeding at the same time that the chickadees are there. Now I'm convinced that they hear the chickadees chirping and they go out there, because there's a lot of chickadees and there's several voles coming out at

that time. You don't usually see the voles unless the birds are coming out. So it's part of their --

KAREN BREWSTER: But it's just so really fun --

DAVID KLEIN: So, it's predator avoidance strategy. I mean, join these other little things. They get along, oh, fine with one another. Because it's like chickadees only do this -- they don't do it in the breeding season. They become very -- just a pair goes off by themselves.

KAREN BREWSTER: But it's fun to see you talk about these things, 'cause you do, you get so excited. And I say it's like you're a little kid or like, you know, a first-year student just now learning this new concept. And it just shows this passion you have for what you do.

DAVID KLEIN: You know I used to be -- People would say, "You're a good ecologist," when I was doing work with deer and stuff. And I thought, "An ecologist?" I'd like to think that someday I would be a good ecologist. And now I feel like I have this ability to -- you know, if you go out with the neighbor kids and their moms on a nature walk, and, you know, they think I can answer any of their questions. Well, I can answer a lot of their questions. And they pick something up, and I get a thrill out of saying, "Well, you know, that's --Why are those berries together in a little pile? Did someone put them there?" And they look at me and then one of them will say, "No, probably not. Some animal did that." And they say, "What kind of an animal?" "I don't know, but let's look closely." And then there's a vole dropping. And I show it to them. "Yeah, that's what it is." And then they feel so good, and then they'll say, "Dave knows almost everything." No, I don't know everything, but I can learn by having my eyes open, and I want the kids to learn the same way. So, you know, I don't know more than people that are out there observing, too. And then Native people are closer to, you know, what I am. They're generally ecologists because they've learned the hard way, but they haven't been trained to answer some of the questions that I've have an advantage over them on.

KAREN BREWSTER: It's that being a keen observer? Is that what you mean?

DAVID KLEIN: Yeah, yeah. Being a keen observer and the ability to interpret.

KAREN BREWSTER: Yeah, observing and then thinking it through and putting the pieces together?

DAVID KLEIN: What bugs me now about education, is I see we're turning out young people with PhD's in biology and they don't have adequate ecological training. But they're doing spectacular work, say, interpreting with DNA and then they make the assumption -- and some of their advisors are guilty of leading them to think that they are ecologists, these young people, partly because their advisors aren't really ecologists either. And they may be a specialist in DNA and species identification and taxonomy and know all the rules and regulations about that, and they may have done good fieldwork

themselves, but they go out in the field and their goal was to get tissue material. And so they have to learn something about where the animals are and they may be satisfied with hair samples or what they get DNA from, or feces, and things like that, which is good, but they don't ask questions about -- other questions about the ecology. They could from that. They're so focused on their particular field of expertise, so they don't -- they're not interested -- if I ask them a question, "Well, what was in the fecal samples that you got the -- what were they eating?" "Well, we can do that with DNA." Why didn't they do it?

KAREN BREWSTER: Why didn't you just look?

DAVID KLEIN: They say, "Well, somebody else can do that because I'm a specialist in that other area." But when they're interviewed by the media, and the media asks a question that's -- you have to understand ecology to answer it and you can't answer it if you don't have some ecology. They could have if they were good observers. They could have answered the question, but then they speculate. And, oh man, some of the statements they make and as an expert. And they're treated as an expert ecologist by the media. And one of them, I won't mention names, just got a PhD here and she did a good job and she was focused on modeling. And she was -- then she's on the faculty now, and she's doing good work, working with a group of modelers and she -- they were doing some modeling of caribou information and habitat relationships, which was good. They were using some of the satellite imagery to get at some of the complexities in ground-truthing some of that. But then, she was interviewed by the press. This was months ago. And they asked her, "Well, what's the future with climate warming for caribou?" And she said, "Oh, caribou are so adaptive that they move around. You know, they cover vast areas when they're feeding. They'll just move. They'll just move." And, you know, the person that was interviewing said, "Well, where are they going to move to?" Well, you have to ask that question as an ecologist. There has to be a habitat that will support them that isn't already occupied and it has -- Is it the kind of habitat that they need? Well, she didn't -- she was hooked to this idea that caribou will move, therefore, if there's a disaster, a big fire in the winter range, they'll go someplace else. Well, they will, but if you have too many fires, there's no place else to go.

KAREN BREWSTER: Right. Or they'll go someplace where there are already caribou and there'll be too many and it can't be sustained.

DAVID KLEIN: Yeah.

KAREN BREWSTER: Yeah. Well, I think you're a good ecologist.

DAVID KLEIN: Well, I feel --

KAREN BREWSTER: Now do you feel -- do you feel --

DAVID KLEIN: -- I'm an ecologist now.

KAREN BREWSTER: -- you now feel you've attained that?

DAVID KLEIN: Yeah. I think I've attained that status, but got to keep at it.

KAREN BREWSTER: Well, you do and that's very impressive.

DAVID KLEIN: And I -- the minute I step outside, you know, I'm seeing things and I'm trying to -- If I'm seeing like spruce seeds laying on the ground. Why are there so many spruce seeds laying on the ground? Well, the reason is that we've had a -- we had several of six or seven years when we had virtually no white spruce seed production. Partly, because they only produce seeds in the best conditions once every three or four years. But why it went so long this time was because we had the spruce budworm, which ate the flowering parts. And so the spruce trees didn't produce any seed. And then we had -- they only produced it if they got enough -- if it's not a summer drought, which we had too in the past. So here we had -- we didn't have a summer drought this year.

KAREN BREWSTER: No, we did not.

DAVID KLEIN: And man -- and the squirrels' population -- the red squirrel population went down because there wasn't a lot of spruce seed around. But some of them survived and eating black spruce seed and whatever. And then they came back, but they couldn't begin to cut all those cones up there. And white spruce cones open up. And as soon as it gets cold or even dry, it's had plenty of length of growth season and so these seeds were coming down. Normally, all those cones would be cut by the squirrel.

KAREN BREWSTER: Oh, right.

DAVID KLEIN: And this -- there's seeds everywhere. And they were out on the deck and I commented to Ned (Rozell) that --

KAREN BREWSTER: Your neighbor.

DAVID KLEIN: -- that, "Have you seen all the spruce seeds on the deck?" And I said, "And then I see grouse walking down there on the driveway, and what are they doing? Pecking?" Well, I walked out there and it's the spruce seeds everywhere. The voles are out there picking it up. This was mostly a couple months ago --

KAREN BREWSTER: Right.

DAVID KLEIN: -- before the snow came. And then I saw a nuthatch on the roof of the woodshed from upstairs. I looked out the window and it was down there and it was picking these seeds off the roof. And this was very unusual, but these animals are very opportunistic.

KAREN BREWSTER: They're all very excited.

DAVID KLEIN: Opportunistic in taking advantage of everything. And I brought this to Ned's attention. He said, "Wow, that was a good analysis of all that. I would never have thought of that." He doesn't think --

KAREN BREWSTER: Well, that's why I say you're a good ecologist. You're curious and, I mean, just what you said that you go outside and your brain immediately you're seeing all this stuff, you're looking at it, you're interpreting, you're asking questions, you're putting it all together. Not everybody does that.

DAVID KLEIN: I know. I realize that.

KAREN BREWSTER: And that's a wonderful quality.

DAVID KLEIN: But I need to explain things psychologically. Now, if I see something, well, why is that so? And I can do that even picking up a seashell on the beach. You know, I'm going to ask these questions. Well, why is this shell here? And then I can answer a lot of questions if I know a lot about seashells, but I don't know a hell of a lot, but I know enough that, yeah, I can answer some.

KAREN BREWSTER: But I think -- I mean, you're a good example of how being curious and being observant and asking questions and being passionate, you know, all of those things have combined to, you know, make you a good ecologist, I guess.

DAVID KLEIN: Right.

KAREN BREWSTER: You know, it's a good example. You know, that you said that being out with the neighbor kids. They get excited because you're excited.

DAVID KLEIN: Well, that's --

KAREN BREWSTER: And you're teaching them.

DAVID KLEIN: -- that's one of the reasons why I'm out there is I like to see kids excited and I like to see them learn. And I appreciate if I'm the one that's stimulating that, too. Yeah.

KAREN BREWSTER: Yeah, I mean, that shows you enjoy teaching.

DAVID KLEIN: And they love me, and I love them as a result of that.

KAREN BREWSTER: And you enjoy teaching whether it's a three-year-old or a twenty-year-old. That gives you pleasure to see somebody learn.

DAVID KLEIN: Right, yeah.

KAREN BREWSTER: Anyway it's -- as I say, it's a good role model that the joys of being curious. That at any age, we should all continue to be curious.

DAVID KLEIN: And I'm curious about people, too. You know, trying to understand people. When I was younger, you know, I didn't think -- as a child you're doing that subconsciously. You know, you like some people, adults, and you like teachers, some of them more than others, and grandparents, you know, some of them have a good way to interact with kids and others maybe a little bit aloof. And so I realize, my daughter who lives in Homer is just like me. I mean, she can -- she thinks about people and why are they smiling now, or why are they not happy, or something like that. And tries to understand. And I'm the same way, and so it's somewhat in our genes. And if I go in and I'm traveling and I'm in an airport waiting for the plane, I usually have something to read and I sit down, but I'm more fascinated by watching people. And then I see a family come through with kids and I try to figure out their ethnic origin by their appearance, and maybe clothing, and then I see their relationships between parents and kids. And sometimes they're really pretty much under control, sometimes they're totally out of control, and sometimes that out of control is the kid's nature. And some kids are so hard wired that it's hard to keep them under control. Others are out of control because the parents didn't keep them under control. And they're the ones that the parents suddenly realize they're not being considerate of the people sitting down and banging the back of their seats.

KAREN BREWSTER: Well, it's -- you're doing the same thing. That example you just gave is you just did fieldwork of humans in the airport, is the same as going to the top of the mountain and watching that group of sheep interact and do what they do and how the parents raised the young. You're doing the same thing whether it's animals or people.

DAVID KLEIN: Yeah.

KAREN BREWSTER: Really.

DAVID KLEIN: Oh yeah, it is. And, of course, I'm doing it from a male perspective, too. So an attractive woman is going to attract my attention closer more than a guy just walking there. But in the guy, too, because I'm trying to get an idea of what kind of a guy he is.

KAREN BREWSTER: But you see I do it, too. I watch people and try to figure out and -- and observe, and why they're doing what. And we all -- well, I don't know if we all do it, but at least we, you and I do it.

DAVID KLEIN: When this black woman was here from the --

KAREN BREWSTER: Jehovah's Witness?

DAVID KLEIN: Jehovah Witness. There was one point I said, "Yeah, look at the problems in the world." We were speaking and agreeing with one another. And I said,

"Yeah, a lot of the problems in this world stem from our history. And like the Bible was written by men and is male-dominated. But we're changing now and men are not changing very well. They're not doing it gracefully." And she kind of sparkled and she said, "I see what you mean. And yes, I think --" She agreed with me, which surprised me because I said that before I stopped to think how we're going to -- how does this relate to religion?

KAREN BREWSTER: But you're -- this is interesting, you said you're curious about people, too. That does fit with your interest in archaeology, and the peopling of the world. It all fits. It's all part of being an ecologist. Humans are part of ecology, right?

DAVID KLEIN: Exactly, yeah.

KAREN BREWSTER: And not all people who study biology, or who study physics, or who study chemistry, care about the human side, and so to me that feels unique in that you're interested in archaeology and prehistory as much as you are in biology. Do you think that's unique?

DAVID KLEIN: I think it probably is. There are other people like me, but, yeah, it's really unique.

KAREN BREWSTER: Where does that come from, do you think, in you?

DAVID KLEIN: It came from my parents, the genes, yeah. And, you know, partly because of these interviews, especially the earlier ones about my youth, I mean, you know, it's forced me to think a lot about -- sometimes when I can't go to sleep at night, but even if I just think about it when something comes up and I realize -- Yeah, I realize how important it was. My father or my grandfather or my mother emphasize this when I was a boy because they were good at seeing how -- what the potential of their three children were. And we all benefited from that in different ways. And, yeah, and I think parents should think more about that themselves when they're raising their kids. They do, but they're not really conscious that they're thinking about it.

KAREN BREWSTER: You mean thinking about the influence that they have on their children and who their children will become?

DAVID KLEIN: Yeah. And when you look back in our history and we just deal with say gender -- the change in gender relationships. Historically, you look at some of these famous men whose -- look at what their fathers were. You know, if they were a university professor or their fathers were a lawyer, or university professor, or medical doctor, they usually wanted their son to be the same.

KAREN BREWSTER: Right.

DAVID KLEIN: And for women who were achievers, it's not as clear cut because we don't measure achievement the same way for women. But for say artists, it was some

cases the mother was an artist or the father was an artist, and they then saw artistic ability in the young person and did what they could.

KAREN BREWSTER: Encouraged them.

DAVID KLEIN: And the same with music, and outstanding musicians. The parents were usually musicians, too, but not all of the kids in their family were famous musicians -- became famous musicians. But the ability to see these talents in their kids, and then try to help them develop them.

KAREN BREWTER: Well, you help nurture them and encourage them.

DAVID KLEIN: Yeah, but to understand that the potential is there in some versus others. And it's not an absolute way of doing it, because you hear some of these interviews on public radio about -- of musicians and they mention what finally turned them on because it was just understood that you'd be able to be musical like they were, their parents. But they didn't expect that they would be special and suddenly, 'click,' they got stimulation. But it was usually their parents setting a role model for them, not necessarily directing them. It's the same with actors and --

KAREN BREWSTER: Well, what about you, do you have something particular that went 'click' for you? I mean, your parents were not ecologists or scientists?

DAVID KLEIN: No, but both of them were keen observers. My mother, for plants and wildflowers. I mean, she knew them and she knew that --

KAREN BREWSTER: Right. And your grandfather.

DAVID KLEIN: Knew the seasonality. And my father was an ardent outdoors person, but unfortunately he wasn't around as much as we would have liked. But I --

KAREN BREWSTER: So you don't have any one thing where that 'click' happened?

DAVID KLEIN: No. Where it didn't 'click' once was where -- Yeah, there were two things, one was music. I mean, I like music, but in the school when I was in the public school when we moved down from Vermont, of course, there was no music in public schools in the little communities. And moved down and went for several years in Hartford, big classes and no music. And then out to this village for the seventh and eighth grade where they were both in the same room. And once a month, a music teacher came for the four rooms, all eight grades. She spent a little bit of time in each one. And we were supposed to learn to read music. I was not a good reader, period. And I thought, "aah" [sighs] what a waste of time learning to read music. And now I regret that so much. That if I had gotten to read music I probably would have been able to plunk away on the piano or the guitar or something, and even do something. And the same with -- Well, my father was musically inclined and he had had lessons, violin, and he had a violin. And he -- when they only had one -- Well, the oldest daughter was six years older than me and

four years older than her middle brother. And she had some violin lessons, and dad also thought he was going to teach her to play the violin, too. But I never saw him play the violin that was up on the shelf. And the reason I didn't is because the only time I was -- when I was that age and interested, he was then working these long shifts and had so much to do at home rebuilding this home and then he would help with the gardening, and there wasn't time for it. And so that sort of explained things to me, 'cause I wished I had had some more focus on music. And then art was sort of the same way. My mother had training in art, and she had one job painting china and mostly floral designs. But she had -- she loved flowers and she had a nice eye. She played it down in saying, "Well, I was just copying." But she wasn't. I mean, they said what they wanted and they had pictures and also a flower display to work from.

KAREN BREWSTER: You didn't pick up the art ability?

DAVID KLEIN: Well she -- I was good at drawing and I was one of these really slow guys that I could take a picture of a train in a railroad station and kind of do a line drawing, and without any training. So that was when we had moved down to Hartford, and so dad had gotten a job, and so my mother suggested that maybe it would be worthwhile to have some lessons in art. And we were living in the city then, and so she checked and there was a deal where a woman was -- you'd meet one or two days a week, something like that, and it was for kids. And so I was about fourth, fifth grade maybe at that time. Or third or fourth, probably. It was probably third or fourth. And I went there, and I was a very shy guy and very -- I was -- I didn't appreciate any capabilities that I had. I knew that I liked to draw and my mom and brother and sister appreciated -- knew that, and I was doing okay in that. And so here I went to this -- they had to drop me off there, they had to take a bus, I think, and show me were to go and then she came back when I got out and went back home with her. And, well, that was a disaster for me, 'cause she wanted -- here there weren't that many kids, like there must have been six of us. And, "Okay, this is what you do, you got the paper, now I want you to take a crayon, colored crayon, and make a slash like this on the paper and --" This isn't what I expected. "And a couple of those things and see how nice a curve you can make to it." And then she'd go around looking, "Oh," she'd say, "Oh, no, that doesn't look very good, you know." At the end of that session I -- that had nothing to do with my interests and capabilities. And so after it was over and mom came and picked me up and she said, "Well, how did it go?" And I said -- I really felt bad, because I felt it must be something wrong with me because I didn't think -- I didn't feel like I connected at all. And I told what happened, and I had thought that she would let us do our own thing and then correct. You know, something like that. And then I could handle that. But I remember talking to my mom quite a bit about it. She, too, because it cost money. And I said, "I think it's a waste of money because I just didn't connect at all with her." So that was it. But she made this effort and I appreciated that. But then it was my shortcomings of getting focused on other things and not caring about that. When I took a course in high school, I took biology. I loved that. And the instructor wanted us to draw pictures of plants and things like that, of different kinds, and I loved doing that. And I got a good grade. That was one of the few courses I got a good grade in. And I learned a lot about biology, because I was keenly interested obviously. And then I always had a keen eye

about landscape and architectural design and what. So I've used my -- this art capabilities, and I've studied on these areas that I was interested in. And landscape design, too, I did some studies of different countries, especially Japanese gardens and what. And when I've been over there once or twice for a conference and I've made a point of visiting some of those. And those are just so beautifully done, and realize the ability of the people to put it together. They're not just gardeners, they're artists. So at any rate, I have a real appreciation for art and that's good. That's fine because I hadn't -- I would've been bored being an artist and not being able to move around in the environment and learn more about it.

KAREN BREWSTER: So do you feel like what you've ended up doing, being an ecologist, was the right path?

DAVID KLEIN: Yeah. There were times when I was fascinated with architecture, but it was more residential architecture and building and carpentry and stuff. And then I was stimulated to think more about architecture and design. And I would think, yeah, I could have been happy as an architect and probably would have eventually been a good one. But then I thought, being a biologist is much better because biology you learn about yourself and as well as about the rest of the environment that you live in. And that, to me, if you know more about yourself you get along better in the world than if you don't. And then ecology, of course, helps you to understand your place in the world. Like sometimes when I was a boy and you'd have the stars all out and we'd be out and go outside and we'd learn some of the constellations from dad, but I got fascinated in that. But it was -- I remember my dad particularly said, "Just imagine how small you are relative to the universe, and we're only seeing a portion of it. That how you're so insignificant and yet we're here together and it's good to have a feeling of not being, the world that we know, the center of the universe." And I appreciated those kinds of experiences when you're out there. And when I was drafted in the Army down at Fort Richardson, basic training, and that was in the '50's so Anchorage was a little different then. But one of the things we had to do is guard duty. Well, it was guard duty up on the hillside where there were these ammo deals, big concrete things and locked doors and what. And it was just a little road that you could get there with a four-wheel drive truck on, but it was up on the hillside. And it was kind of nice. You could go up there and at first I didn't take a flashlight, but I finally got a small flashlight because I could get up there and sometimes I could see these stars and walk around in pitch black. And there weren't a lot of lights then the way I was facing to the west, I think. And you get so you can walk carefully with the minimum amount of light without tripping and stuff and moving slowly. And keeping moving, it was -- it was, I think, early winter, and so you should keep moving. And we had good clothing. And to just be up there and not do anything was -- it was so boring and you got burned out so fast. And I'd wander around and then I finally took this little flashlight and I had bought this map of the heavens that would fold up and I could keep that in my pocket and then pull that thing out and take this -- And you weren't supposed to have a light up there when you're doing this, but I'd cover the light and then I'd locate these constellations. And so that was -- I was learning constellations. That was fun, I enjoyed doing that. But that was the kind of experiences

where you feel how small you are when you're out there and you're looking at the heavens.

KAREN BREWSTER: Yeah. But I'd say, well, you know, talking to you and watching you, to me it feels like you made the right choice. Biology and ecology, it excites you. You have passion. It has to have been the right choice. You've had a very successful career, and continue to.

DAVID KLEIN: And, you know, this deal about the rocks there out at St. Matthew (Island) and the birds, you know, when I came up here and spent this year in Alaska, then I went back after a year, I knew what I was going for at the University of Connecticut to do an undergraduate degree. And I had some credits I could transfer from here and military service. One of the electives I could take in the sciences was geology. And yeah, that was definitely one I wanted to take. And man, I clobbered that thing. There were all these things about landforms and I'd seen it in Alaska in just short time I'd been here, whereas back in New England, you know, forest, and you didn't see the rock formations or anything. You knew that the highest mountain was there, which I had climbed in Mt. Washington, but you didn't see much exposed rock. And here in the meandering -- up in the Brooks Range, the meandering rivers, and I could understand all those things. And the geology, I was just so fascinated by it. And I got the highest grade in the class. And the professor talked to me, and he said, "Are you going to continue on in geology?" I said, "No, I'm in wildlife." [Laughing] But, I could've continued on but I was already committed to living systems.

KAREN BREWSTER: Yes.

DAVID KLEIN: But the landforms, that fascinates me. And when I'm flying, I frequently want a window seat, if it's going to be daylight. I want to see the landforms.

KAREN BREWSTER: Yeah, me, too.

DAVID KLEIN: And then in the Lower 48, you know, you're reading a lot of things about agriculture and irrigation and you realize that, you know, there's vast areas with no people. Or you don't see much sign of people. You see the occasional road and --

KAREN BREWSTER: Right, little house, little farm house.

DAVID KLEIN: And little farm house. And then suddenly bingo there's people everywhere and buildings all over the place, and rivers and stuff. And then you can reconstruct to why the cities are where they are, and these rivers, and have a little bit of history of the country. And so it's fascinating. And the same when you're flying over Europe, I mean, trying to relate what I know about the countries, and that's, to me, very fascinating.

KAREN BREWSTER: Well, you had talked about how there are some musicians or artists who say they have this spark that made them want to do what they do. And we've

talked about all these influences in your growing up that led you to do what you do, can you relate anything to a spark that was a particular moment or that inspired you or was it just all of this put together?

DAVID KLEIN: All of it put together, yeah. I was a typical young guy, too. You know, doing -- playing with other guys and enjoyed touch football and things like that, where we didn't -- all of these things were outside and a little bit of softball, yeah. And regretting things that I'd like to do in terms of activities, weren't too realistic, like we weren't in a good place to learn to play tennis and things like that, which I thought, well, that should be fun.

KAREN BREWSTER: So the path you've taken with your career is sort of the accumulation of all these experiences along the way?

DAVID KLEIN: Right.

KAREN BREWSTER: Okay.

DAVID KLEIN: Gardening, plants growing, and helping out --

KAREN BREWSTER: And liking to be outdoors?

DAVID KLEIN: Yeah. Hm-mm. Right.

KAREN BREWSTER: Yeah. It's interesting to think about, as you say, how we become who we are.

DAVID KLEIN: It is. And some of it is sort of out of your control really. And I realize some of the -- my own son, for example, I was sort of disappointed that he wasn't more assertive in trying to decide what he wanted to be. But he was sort of doing the same thing as I was. Not that he isn't turned out like me, but he turned out to be a terrific guy and he turned out to develop his own capabilities, which was mainly management of people and work and accomplishing things that way. But he did it on his own, sort of, and that's what I did. And I never tried to push him, but he felt pushed a little bit because my wife, his mom, she saw that these kids had a big potential and she had the college education and I did, and so figured college was the way to go. And I think my son was -- perhaps didn't want to compete with me. He was interested in a lot of the same things, he didn't want to compete with me.

KAREN BREWSTER: So he did something else?

DAVID KLEIN: Yeah, it started out that way.

KAREN BREWSTER: But it's true, we all are a combination of our genes and our upbringings, and those influences, but also the people we meet along the way whether they're friends, whether they're teachers and mentors. The experiences we have, all of

that builds on itself. I mean, your childhood, your coming to Fairbanks for that year, and your time out in the Brooks Range, that influenced you. Your research that you did for your PhD. I mean, all of that --

DAVID KLEIN: Yeah.

KAREN BREWSTER: -- make us who we are.

DAVID KLEIN: Yeah, there were highlights. And that Brooks Range thing was an important part of being here. I mean, driving all the way up here and into Fairbanks, it isn't the most scenic part of Alaska. I didn't go down on the Kenai then. That came later. And I was just lucky that I went to the Brooks Range and that's a special area, too. And I was turned on by mountains and that was -- sort of turned on by mountains before then. And it was partly that the life zones are so different from the bottom of the mountain on up. And that's what fascinated me. And so that diversity of life zones and the work I did when I was starting my master's with mountain sheep and going -- that was nirvana for me. I never -- I remember stopping and thinking a couple of times, "Here just a short time ago, I was back in Connecticut and I just didn't realize how beautiful the world is and especially this part of the world." And I loved the environment I was in. In Connecticut, working in the state forest, it was pretty pristine. There were a few deer left in there and a natural hardwood forest. And I learned a hell of a lot. And with help from my mom when I was younger, you know, I knew the wildflowers and was learning more. And in forestry, I was fascinated with learning about the different trees and had a good understanding. And then working for the State Forest, the other guys had learned the different kind of woods, and worked with them cutting them down or some made into lumber. I mean, all of these things were fascinating for me. And then that related to understanding the north woods and how it was -- southern New England was going back to forest now after it had been settled and people had gone west. And especially in Vermont, you know, it was so rocky and what that people finally pulled up stakes and went west. And so some few farms remained but you go out in the woods and you'd see these old foundation sites.

KAREN BREWSTER: Right, with the little rock walls and things.

DAVID KLEIN: Yeah.

KAREN BREWSTER: Well, all this time we've been doing all this talking about all your accomplishments and successes and the students you trained and all that, we haven't talked anything about some of the --

DAVID KLEIN: Failures.

KAREN BREWSTER: Yeah, or regrets. Sometimes we've talked about challenges, but are there any of those failures, regrets-type things, you want to talk about?

DAVID KLEIN: You know, last night when I was there at that event and Bernie Karl came over and talked to me. And then two or three people came over and I had three conversations going on at the same time. And then they all kept changing because when someone would come over they would talk differently and there was someone else there that was in it, but had to do with Bernie. Someone made some comment about Bernie disappointment. He was so upbeat about the thing that Walker --

KAREN BREWSTER: The new Governor Walker? Yeah.

DAVID KLEIN: And Mallot (Lt. Governor), but someone said, "Well, were you disappointed about others?" And he said, "No, you've got to take these things as they come." "I take every day as it comes and I've never had a bad day in my life," he said. "Never had a bad day." So then I jokingly said, "I just had one that wasn't so good when my computer screwed up." And he said something about, "Every time I get up in the morning, I just know it's going to be a good day for me. And it turns out it is."

KAREN BREWSTER: And that's how you feel?

DAVID KLEIN: Well, we discussed that a little bit. And then, yeah, that's how I feel. And then I thought, you know, when that thing screwed up and I immediately said, "Well, what do I do now?" And I said, "Well, what I do is I've got it saved on -- as I was doing on a couple of flash drives but they're not too well organized. I'll have to search for them. How will I search for them? Well, why don't I use the Apple computer?" I mean, I could go upstairs to the computer up there, which is slow, but I could've done it up there. And I could've gone to the university where I've got another old laptop that sits there that would probably work as a PC. So I said, "No, I mean, it's not a disaster. There's plenty of time left and again I can probably get this thing fixed. That's a high priority. And then while I'm waiting, I'll try working on the Apple." And I did all that. And then in retrospect at the end of that day, I thought, "Well, I've almost got this one done on the Apple. And I learned how to use that and that's good." So I tend to see the positive side of any situation. And people have asked me, "Aren't you worried about," something or other, even if it's say a health problem or something like that. Well, no, I want to know about and then chances are worrying won't do any good. And if it's a friend that's having problems, yeah, I'm concerned about them, but worrying about it doesn't do much good. Worry doesn't do much good. And so that, how do you handle stress? Well, I don't. I'd say I avoid stress because I try not to worry about things. And if the things are piled on me, then I try to respond to the challenge. And if it's real stressful, adrenaline kicks in and I can handle it. And it's just as if you're out there in the woods and you're -- or out on the road and your car broke down, well, you've got to deal with it. And the best thing is to deal with it and not to worry about -- It's not a disaster. And try to avoid disasters and be careful, and don't do risky things that are unnecessary to be risky.

KAREN BREWSTER: Well, it does sound like, you know, your computer example shows the responding to the challenge, as well.

DAVID KLEIN: Yeah.

KAREN BREWSTER: This is what happened, "Well, okay, I'll learn a new program." And being open to those new experiences and that it's not -- that it's a challenge and it's a learning opportunity, not that it's a disaster.

DAVID KLEIN: Yeah.

KAREN BREWSTER: Sounds like what your approach --

DAVID KLEIN: And if you can -- what's the worst case scenario? Well, it's one you can't figure out any other alternative. Well, when that comes, well, it comes.

KAREN BREWSTER: So you'll face it when it happens?

DAVID KLEIN: Yeah.

KAREN BREWSTER: So is that to say that you have no failures or regrets along the way?

DAVID KLEIN: Well, what do you call a failure?

KAREN BREWSTER: I don't know, you used the word failure so I don't know.

DAVID KLEIN: No, no that's true. I mean, it's all what you call a failure. When my wife and I broke up and divorced, it was -- first wife. It wasn't because we didn't love one another and we didn't enjoy sharing being parents of three great kids. And for me, it would have happened earlier if the kids weren't there, but the kids held us together and I don't regret that. I think that was a positive thing. And it was a tough one, because there was another woman involved. And that was a tough one. But, yeah, it was the kids that kept us together. And then that was positive because when you've got kids as well as a wife, then it's a family and your love is spread out. And so it -- And, you know, the hard part was, you know, how did the kids interpret this? Well, the first time we separated once, then -- well, that's true that was the first time with there was another woman involved. Then coming to the reality of breaking up the family and not being involved with the kids as a family was what kept me together. And the other woman had a child, too, and it was the same situation. More complicated with her than for me, because she was from Denmark. And so it was -- Yeah, it was -- we could have made a new life together but the loss would have been the big one for both of us. And it wouldn't have been a total loss in terms of your relationship to your kids, but it would have been a loss that would have been substantial because the kids wouldn't have been such an important part of my life. And the kind of things that you think about differently in the stage of your children growing up and, well, marriage and then having kids and then carrying on. And then humans are vulnerable, too. Especially when you're in a situation where you're interacting with lots of other people and you're in a position of, you know, easily falling in love with outstanding people that you meet.

KAREN BREWSTER: So how old were your children then when you divorced?

DAVID KLEIN: That was -- Laura was 17, the youngest one.

KAREN BREWSTER: Okay.

DAVID KLEIN: And then so she was ready to leave at 18 and go out on her own.

KAREN BREWSTER: So you waited until they were grown?

DAVID KLEIN: Yeah.

KAREN BREWSTER: And so how many years was that between initial separation and then that decision to -- ?

DAVID KLEIN: That initial separation was about a month, I guess.

KAREN BREWSTER: No, but how much longer after that did you stay married? It was how many years that you stayed for the kids?

DAVID KLEIN: It was probably 8 years.

KAREN BREWSTER: Okay.

DAVID KLEIN: Yeah, or 9, something like that.

KAREN BREWSTER: And then you've had two other marriages since.

DAVID KLEIN: No, one other marriage and then a partner.

KAREN BREWSTER: Oh, right, okay.

DAVID KLEIN: So then the second marriage was after I -- See, I'd been divorced probably about three or four years. And, you know, had a couple close relationships. Then, in fact, one that I regretted a little bit because I was in love with a grad student who was from Thailand. But her mom had divorced her father and then moved with her to the U.S. She had married an American and they lived in Anchorage and she did her undergraduate in Anchorage and came here to do graduate work in political science, I think it was. And she was a good friend of one of my students. But she wanted to get married and she wanted kids right away, but she was a brilliant young person and just terrific personality. And I wasn't ready to start over again, and so I didn't want to go that route. And then a year or so after that I met LuAnne, who -- she was an impressive woman who had, in many ways -- She had grown up in Seward and Anchorage. And she had family down in Anchorage. Yeah, mainly in Anchorage. And a brother and sister and parents. But she had finally divorced her husband who was an alcoholic, but after four,

five boys. Five boys. And never could quite understand why she waited so long. And then she worked her butt off, had some help from her parents, but, you know, mostly it was eeked her way along and she raised these boys. They lived in Juneau for a while and she had jobs that weren't big paying jobs but they were -- she could get by but just barely financially, and probably food stamps and things like that.

KAREN BREWSTER: And is that who the house on Chena Ridge -- is that who you built that for?

DAVID KLEIN: No, that was the partner.

KAREN BREWSTER: That was for Heather?

DAVID KLEIN: Heather, yeah.

KAREN BREWSTER: Okay.

DAVID KLEIN: So, at any rate, this, LuAnne, she was a fun person but she -- we didn't -- we had different value systems and she was lucky she had -- her sons had good genes and did well. And she finally was able to -- part-time go to school and got a bachelor's in -- what was it? Psychology, is that what? Well, at any rate she got a job with -- as a parole officer with the court system here in Fairbanks.

KAREN BREWSTER: So you were married to her for how long?

DAVID KLEIN: About 10 years.

KAREN BREWSTER: Okay. I'm sure you've already told me this before, but --

DAVID KLEIN: I'd have to check on the dates.

KAREN BREWSTER: I'd have to check the dates on when you and Arlayne were married and divorced. And we can get all those dates, I'm sure, at some point.

DAVID KLEIN: Right.

KAREN BREWSTER: Okay. So it sounds like a little bit, since we started this topic of failures/regrets/ disappointments, it sounds like your --

DAVID KLEIN: I don't consider them failures, and I don't -- I realize that my future wasn't headed in a good direction with LuAnne because she got burnt out up here and she didn't like it and then she tried all these things. She was not good at financing and so when we got together and it was going to be a shared partnership, but pretty soon she wanted to get training as a counselor, which she did. Conflict counselor. And she went down to Vancouver where there was a good place to do it and could do it in about five months or so, intensive. And I admired her going, but she wasn't very realistic and

understanding in that they would, in financing, you know, she -- that they wouldn't take a loan from me. No interest loan to do this. And we didn't get married at first. We got married after we'd been together for quite a while. And she -- then she had some retirement, and she said, "I'll just use my retirement." I said, "No, don't use your retirement, that doesn't make sense at all. Just take loan and you can pay it back if you, you know, if worse comes to worse. And you're capable of doing it." But she wanted to start a business after she had this training here in Fairbanks, and it was unrealistic. She wanted to start with a nice office and everything. And you don't start that kind of work that way. You've got to have a lot of people that are coming to you if you're going to do that. You've got to build a reputation. And she knew that, that other people in town that were busy, they didn't have a big fancy office. And she wanted to do it right and she thought that would attract people. Well, it isn't what attracts people. And then her brother in Anchorage was a counselor, too, and he had one of these doctorates that you could get in a short order. And he was an okay counselor, I think, but she relied heavily on him and wanted to work with him, which would have been a mistake because he was worse than she was in finances. And, at any rate, it was getting more and more that she didn't like living here. And then she, of course, wanted to be close to her boys as much as possible. They had all gone down to -- No, they didn't. There were still two here and one of them lived with us and finished up a master's here. A brilliant guy. In physiology, yeah. And the boys were all tall, handsome young guys and really done amazingly well for --

KAREN BREWSTER: But what about in your professional life, anything -- disappointments or regrets or failures, whatever you want to call them? Negatives?

DAVID KLEIN: Well, disappointments. There's a lot of disappointments when you start writing papers and you submit them and they don't get accepted for varying reasons. And sometimes you feel that it wasn't a fair review, etc., etc. And the best thing to do, it's just like a writer, is modify it if you feel the review was critical and justify it and resubmit. And you have to learn to do that. And that's not easy, but it's true of anything you do. Frequently, if you try and it doesn't work out too well then you can -- Usually, if your motivation is there, you think that maybe you could do a better job and get over it. I didn't have a lot of that kind of stuff because everything seemed to happen before I really wanted it to happen, but it happened. I never thought I would be back on the faculty and as Wildlife Unit Leader so soon after I left Connecticut. Just everything happened so fast and including having to do the military service the second time.

KAREN BREWSTER: So everything fell in place well for you? Was it luck, is it -- ?

DAVID KLEIN: No, it wasn't luck because I had the motivation and goal. Well, the decision to go on for a PhD, I mean I could've stuck with Fish and Game. I had a good job and the head of -- that my boss, thought -- he thought I was -- groomed me. They didn't have a subsistence division. He always thought I would be a good person because I had already had experience with Native people and understand that I'd be a good person to head up subsistence division. I'm sure I could've moved up in it. And I would have enjoyed that kind of work but it would be too much administration and focus on administration. And as Wildlife Unit Leader, you know, you had to do administration, but

I always, in my own mind, and if people asked me, I said I want to use the minimal amount of my time for administration, but it has to be done because of you've got to keep the funding coming in for support the students, etc. But my real interest is working with the students and doing some of my own research.

KAREN BREWSTER: Right, going out in the field.

DAVID KLEIN: Yeah.

KAREN BREWSTER: Well, so it sounds like not luck, but taking advantages of opportunities when they presented themselves?

DAVID KLEIN: Yeah.

KAREN BREWSTER: Is that more what you'd say?

DAVID KLEIN: Yeah, and motivation. Yeah. Maintaining the motivation. And it's the same when -- then I learned a hell of a lot from advising so many students. Which I have had to select from paper. In the early days, there was no way of meeting the students before you -- unless they happened to be from coming through the undergraduate program here, but mostly they didn't. Mostly, they were from some other state or other country. And then, even then, frequently it was all correspondence and you had their CV and their -- sometimes you had -- you didn't even have a picture of them. So you didn't -- it was on the paper and three letters of recommendations. And you learned to do the best you could with this material you had to work with. And that was a real person there. And some of the letters would be from the young person's minister. And you can't -- it doesn't tell you much. But three letters, maybe there was something there. At least there were three letters. And then the grades, I mean, you look at the grades and you go down through there, and they could be better in this area and this area, but their mean is okay. But the main thing, usually, was the letter they had to write. And you got a little bit of a clue on their motivation. But the real tough ones were the ones that had excellent, excellent grades but they were coming from New York City or something like that. And they don't -- they've never been any place besides New York City or that general area and here's Alaska. And some have never been to Alaska and some of those were with excellent grades. Well, if there're excellent grades and letters and everything and you had the money lined up and so you've gone through all these applications that were coming in and you ended up with three or four, and how do you make the -- Or maybe you don't end up with three or four, you end up with one that you don't think is good enough, but none of the other ones did. So you make the decision sometimes that you just hope for the best. And I tended to be super -- it's not luck, of course, but others thought it was lucky that I ended up with top-notch students. But I also ended up with some students that I had tremendous respect for and they were -- they started out and they did like, thought this is going to be great, this is a good person and enjoyed the fieldwork and everything. And then there were brilliant young people, and some of those brilliant ones could have a hard time. They had a hard time because they couldn't focus in very well. They didn't know what they wanted to do.

KAREN BREWSTER: So not every student that you selected for the program was successful?

DAVID KLEIN: Well, the ones that I admired the most were the ones that after they went out in the field for the first time and they came back in and they said, they think they really don't want a master's degree in wildlife. And some of them would say, "Well, I need some more time to think about things." And they had done excellent work and the courses they were taking and everything and they were just top-notch students. And they came in and they were very apologetic and they said, "We realize, you know, you've already spent this money but I don't think I should -- I wouldn't feel good about going through with it." And so I would say, "I really appreciate your doing this and also being open about it now. And obviously it's the best thing for you to do, is something that you feel good about continuing." And rather than being pissed off with them. And so I would usually say, "Well, if you need a letter, I'll write one for you, but I really appreciate your being straightforward about this. And I'm disappointed because I thought it would work out well, but it's best that this experience of the graduate program is yours and not mine or others." So I had two or three like that. And then the master's level, I never had any -- I had a couple that dropped out but never that flunked out. And I had a couple of -- one PhD that didn't finish but he could have, but he got a job. He was Canadian and got a job in British Columbia and didn't need the PhD. and he went on and did good things. And he was married and it was a financial issue, too, and that's understandable. And then there was one woman that I -- that actually, she didn't pass her comprehensive exam and frankly by that time there was little hope that she would, and that was -- I felt bad about that because she was a very nice person. And I did not want to accept her because she had done so poorly on the GRE's and her grades were not outstanding at all, and she had done a so- called master's degree working in Africa with some primate, wild primate. And I was wary because here was a very nice person, seemed intelligent, but there was no documentation of any intelligence. And I had this funding for a study on -- and she didn't -- she just wanted a PhD, she didn't -- she wanted to be admitted and her GRE scores were so low I thought there's a problem here. But she had been -- she'd come and started in before she applied for the PhD, so she wanted to -- That's reasonable, she wanted to get her feet on the ground or what. And I could see that she was just mentally naïve, let's put it that way. She had -- she was attractive and she had boyfriend problems and the type of boyfriends that didn't impress me at all. But I became a good friend with her and she -- You know, I told her about this project and had to write up an outline with the -- It was studying the tundra hare out on the Seward Peninsula. And went out there in the field with her and she wasn't a top-notch skier but we could get around on skis together. And she was gung-ho about fieldwork and competent, but I couldn't get her to write or outline what she wanted to do. She just took the things that I had written to get the funding and that's -- She'd say, "This is what I'll do." And said, "No, you have to develop a proposal. And this is just the question. We want to know more about and how you're going to do it." She just could not get into it. And there was a student award to go to a meeting in Vladivostok related to mammalogy, which, you know, okay, if she -- she applied and she took this exact same thing that I'd -- and she submitted that and she got her trip. And then we had to put this committee

together. Well, I didn't want to accept her but other faculty said, "No, she's going to be good. Look, she asks good questions when there's seminars. Sitting there." And she asks questions but I wouldn't say they were good. And she was not inhibited about asking questions. That's nice, yeah. And I was out there in the field and we lived and stayed in the Fish and Game -- They let us stay in the bunkhouse out there, and we did. I mean, she just didn't have a clue as to how to approach anything about this hare. But she said she was happy to do this. And I realized, I got to see something more. And then she finally said she wanted to go to the North Slope in the winter and look to see whether this tundra hare was ever up there. Well, that had already been written up and nobody'd ever found them up there except there were a couple of reports of hares in Barrow. But they weren't identified for sure, so they could've been snowshoe hares and probably were. And on the west coast of Alaska, they go up just north of Kotzebue. And the archaeological work indicates that they haven't been up there beyond maybe Cape Thompson. Maybe there was one archaeological site, but that's so close to where they -- was the limit to their range now. And there was no record of them being on the North Slope, and so she had this idea she wanted to go up there and look around in habitat where there were already snowshoe hares. And we could tell the difference in the wintertime because the tracks are different and the feces are different. And so I went up with her and we were based at Umiat, and rented a couple snowmachines they had there. But she just didn't have a plan. She didn't have a plan. She couldn't -- So I tried, "Well, where do you want to go, and what kind of -- ?" She didn't have a -- hadn't studied the kind of habitat you should look into. And it was just like she was waiting for me to tell her what to do. And then came back and she -- By this time, she had -- She was just a very nice person.

KAREN BREWSTER: So did she finish the program, or no?

DAVID KLEIN: She -- And then people on her committee included Dave Hopkins. He was the all-around paleo guy. And Joe Cook, who was --

KAREN BREWSTER: Mammalogist.

DAVID KLEIN: -- mammologist. And then the other one was John Bryant. You know John?

KAREN BREWSTER: No, I don't know who he is.

DAVID KLEIN: A terrific scientist but he was very -- Well, he had loyal friends. When he made friends he was very loyal.

KAREN BREWSTER: And he was in biology/wildlife department?

DAVID KLEIN: Yeah. He was the real star scientist here. And did his PhD here and published on secondary chemicals and worked with snowshoe hares. But at any rate, then she wasn't producing any outline of what she wanted to do or proposal. And then time was dragging on and she was getting a stipend and she wasn't producing. And her attitude would be, "Well, yeah, I'm working. I'm reading up on these things and I should

be able to get something done." And then it came time to do the comprehensive exam, and we told her in advance the kind of things she should study up on. And so she took the exam and it was a disaster. She just had not had a good undergraduate training or master's training at all. She didn't understand ecology or biology. That school she went to was a small liberal arts college and we never did -- she was never able to produce a master's thesis, which we said that we had to have that first, and she never produced it. And then it turned out that they -- it wasn't really a master's thesis. That you got this master's because of some fieldwork and course work that you did but it wasn't --

KAREN BREWSTER: It wasn't a thesis.

DAVID KLEIN: It wasn't a thesis at all. And so she didn't have any training in science etc., and she didn't have the ability to follow through. And then her mom came over. She was Scottish origin and really nice mom.

KAREN BREWSTER: So some students don't --

DAVID KLEIN: And she flunked the comprehensive exam so badly that they -- We had to tell her that she flunked and she must have known that she did bad. But technically, she would have -- you can take it over again. After a minimum of six months, you can do another try. But it was so bad, and I said, "We can tell her that, but frankly, I don't want to be her advisor if -- " John Bryant and, who did I say the first one?

KAREN BREWSTER: Dave Hopkins.

DAVID KLEIN: Dave Hopkins. They had both got to know her and thought she was just a sweet, young woman, which she was. And I said, "I don't want to be her major professor, so one of you should take over." And "Oh," they said, "No, we couldn't do it, you're the one that'll have to do it." And so at any rate we told her that she had flunked and that -- and she was really broken. And I think I mentioned this before that, "You will have a second chance if you want to." But she realized she had literally done nothing and I had this project that was funded and I had to do something on it. And she wasn't going to follow through, and that was the last I saw her when I told her that. She left. I don't know where she went.

KAREN BREWSTER: And it sounds like it's disappointing to you that you had a student who didn't succeed.

DAVID KLEIN: It is. And then in retrospect I sort of resented the fact that other faculty kind of pushed her on me. And I did have this funding and she said she would -- I mean, she would have said yes to anything. And her idea was -- I think that if you -- and that was probably with the master's, if you're around long enough and you're a nice person, you'll be awarded the degree. It's not that simple.

KAREN BREWSTER: No.

DAVID KLEIN: And Joe Cook, he was really disappointed with John Bryant and --

KAREN BREWSTER: Dave.

[Chuckling]

DAVID KLEIN: Dave Hopkins, because they weren't basing their judgment on -- You know, "she's such a nice person," they said, "she should be able to finish it." I said, "I don't want to be her major professor. And I can't see her finishing if I'm her major professor because she hasn't produced. and I've got to move ahead with this project." And so --

KAREN BREWSTER: Well, I can see how it's so important to you that -- you like teaching and you like to see people learn, so it would be disappointing.

DAVID KLEIN: Plus I believe strongly in having standards. I mean, if you produce phony PhD's, it's bad for the program.

KAREN BREWSTER: Right.

DAVID KLEIN: And Joe Cook stood beside me on that, but --

KAREN BREWSTER: Well, so many people who've gone through the program have nothing but praise for the wildlife program and the biology program and students who you've mentored.

DAVID KLEIN: And it's kind of ironic because John Bryant was a brilliant student. And he's one of these guys, he got -- he had an interesting background. His father was a geologist, worked with mining companies. And he traveled around the world with his father. I don't know whether his mother, whether they were divorced, but he got a lot of experience, worldly experience. He's a super sharp guy and he had -- did a master's degree in biostatistics at Calgary. And did just top-notch grade and he got burnt out on education. And he came up and hung out around -- he got a dogteam and hung out around Denali National Park. And he did long dogteam trips first, and including northern Alaska and some in Canada. And he -- being very competent and loved it and loved the dogs and then he decided he want to do a degree. But just before that time he had been married to Bryant --

KAREN BREWSTER: Jane.

DAVID KLEIN: Yeah, but they -- John was a very difficult guy in many ways. He was brilliant and loving and kind, but he also had a strong motivation and will. And so then he probably -- And he didn't know what he wanted to do. He was never quite sure whether he was doing the right thing for his own well-being. And so then he -- they got divorced and then he met Peggy, his wife, and still with him. And so she applied to do a master's degree with me. I accepted her, and she was a top-notch student. And she and John just

had a great relationship. And John came and decided that, well, maybe since she's in the program, he'd come and be a field assistant for her but he might want to start a degree program, PhD, at sometime in the future. And that's just what he did. He was a field assistant for her, and she was lucky because he was such a sharp guy and capable in the field. And she became competent and good and did a fine job on working with the Western Arctic Caribou Herd on the forage selection of post-calving time. And she did top-notch work and John was very supportive and helped her, I'm sure. And but she did -- she was just -- she just did top-notch work. It was a good thesis. And then John applied to do a PhD through biology and wildlife.

KAREN BREWSTER: I'm thinking that I'm going to turn off the recorder.

DAVID KLEIN: Go ahead, yeah.

KAREN BREWSTER: Is that okay?

DAVID KLEIN: Yeah.

KAREN BREWSTER: It's getting late anyway.

DAVID KLEIN: Yeah, this doesn't have to be in there.