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NA2746 Jacquelyn Gill, interviewed by Adam Lee Cilli

Jacquelyn Gill
University of Maine

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Description: 2746 Jacquelyn Gill, interviewed by Adam Lee Cilli, March 27, 2014, in her office in Sawyer Hall at the University of Maine, Orono. Gill talks about her transition from the humanities to paleoecology; her research; her upcoming research trip to the Falkland Islands; her passion for outreach, particularly to women in science; the relationship between gender and the pursuit of science; the contributions of the Climate Change Institute; and her experiences as a young woman in the CCI.

Text: 8 pp. transcript

Recording: mfc_na2746_audio001 38 minutes

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Notes

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To transcriber

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Narrator: Jacquelyn Gill

Interviewer: Adam Lee Cilli

Transcriber: Adam Lee Cilli

Date of interview: March 27, 2014

ABSTRACT: This interview took place in Jacquelyn Gill's office in Sawyer Hall at the University of Maine in Orono. In the beginning of the interview, Gill explained in some detail her intellectual journey from the humanities to paleoecology. Later, she reflected upon her research, both in the field and in the lab, and discussed an upcoming project in which she will investigate the extinction of wolves in the Falkland Islands. She also discussed her passion for outreach, particularly to women in science, and for thinking about the ways gender and identity influence the questions scientists ask. Towards the end of the interview, she shared her views on several subjects, including the major scientific contributions of the Climate Change Institute and her experiences as a young female in the Institute.

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

Cilli: This is an interview with Jacquelyn Gill. Today is March 27, 2014, and this is Adam Cilli conducting the interview. To get us started off, I'm wondering if you could tell me how you got interested in paleoecology.

Gill: That's a great question. I have always been interested in the natural world, and I grew up in New England, but I also spent some time as a child in Italy, in the Mediterranean, in the South, in Colorado. My parents moved around quite a bit, so I got to see lots of different kinds of landscapes. So, from a very young age I was very curious about geography and natural landforms, and the different kinds of ecosystems that I saw, and the different climates that I lived in. And I wanted to be a marine biologist, actually, for many years. At some point that segued into environmental science, as I learned more about the environmental problems facing our planet. As a passionate young eighth grader, like many I suppose, I became interested in environmental studies. And when I got to high school I had a series of very good humanities teachers and very poor science teachers, which sort of swayed my interest into history. So, I developed an appreciation for history, and I kept that interest in the natural world, and started thinking more and more about where our environmental problems came from, and the changing relationship between humans and their environment through time. And so, when I started college I actually wanted to be an anthropologist. I had this sort of latent love of science, and I continued to be interested in science, but I basically pursued the humanities. And eventually, I started off at one college, small liberal arts school in Vermont (Godard College); they closed their campus program, and I became an academic refugee and ended up at College of the Atlantic in Bar Harbor. At that point I was sort of having this identity crisis; I wasn't sure what I wanted to do; I'd never really had the opportunity to take science classes, but I'd always been interested in it at the college-level. And when I went to COA, I took a history class, a philosophy class, and a conservation biology class. I actually literally was thinking, "OK, this is what's going to decide it. I need to figure out what I'm going to do." It was creating all this anxiety. I was midway through my undergraduate; I knew I was running out of time. So I took those classes thinking that would shed some light on what I wanted to do. And actually it was the conservation biology

class that really grabbed me, in part because I had an instructor (John Anderson) who was also very steeped in history. He had a good appreciation for history, not only in terms of the history of landscapes, but also the history of the field (the history of science), and the ways about which nature changed through time. And so this started to click for me. The next semester I took a class in ecology, with John Anderson as well, and he took us to Acadia National Park, which was five minutes away, and we went on a hike up Gorham mountain trail, up a hill, and first we started at sea level. And he showed us sea cliffs and sea caves formed by the ocean, and then we hiked up the trail (about 250 feet above sea level), and he starts pointing out all these different landforms that look just like the landforms we just left. Except they were 250 feet above sea level, so we were seeing sea cliffs, sea caves, what look like boulder beaches with trees growing around them. And he explained to us that it wasn't just a coincidence that they looked the same. It was that sea level changed had caused these former... so, these former features had once been at sea level, and as the land was still uplifting after the weight of the glaciers had come off, sea level was now lower, by about 250 feet, than it had been when those landforms had been created. And that was a pivotal moment for me, where I realized that there were these components of landscapes, that they change through time. There's no one static point we can conserve landscapes to, or one point in time that we can say, OK, landscapes ought to look like this. And this idea of change through time took hold of me, and that's when I got interested in the idea, not just of ecology as a field, but also paleoecology, the study of landscapes through time. And for me, it was a natural integration of all my interests. You've got anthropology and humans, and geology and earth sciences, climate change and ecology, and all the conservation questions I was interested in. And so all those things kind of fell together. It just felt like a natural outcome of all the things I'd been thinking about, and had been anxious about. Then we happened to have a visiting paleoenvironments instructor. She came and taught a paleo class. Of all the random things to happen; just as this was becoming interesting to me, the next period we're going to have a class on paleoenvironments. And as part of that class we had Marcus Vandergoes from the Institute come down and take us coring in Acadia National Park. And so we took a sediment core from Sunken Heath, and as we're standing there in the bog, and we're pulling out meters and meters of peat, and turns into this dark, rich organic mud, all of a sudden we pull out a meter of clay. It's this light clay. You can see this transition, from the dark brown organic mud, and suddenly it's light clay. And Marcus looks at it and he say's "that's the last Ice Age." I just touched the last Ice Age. It was like, boom! I was hooked. That was it, it was totally over.

Cilli: That's fascinating.

Gill: It was this magical confluence of events, yeah.

Cilli: Walk me through the rest of your early academic history.

Gill: So, at that point... I was starting to learn about what you could do, how you could reconstruct the past. And so, I was going into my last year at College of the Atlantic, and I decided for my senior thesis I wanted to work out this core and do the pollen analysis on this core that we took (that Marcus helped us take). And so I took a short course in pollen analysis from the University College of London, worked the core up for my senior thesis, and at that time I was looking for graduate advisers. And so I had a great connection (just [from] reading the literature and sending emails) with Tom Webb at Brown University. I sent him an email, pitching an idea. Cause one of his students, Jack Williams, had done this really great project looking at these novel ecosystems arriving in response to climate. And I said, "hey, that's a really cool paper, but we also know that large animals go extinct at the time.

Have you ever thought about testing the role that these Ice Age herbivores may have played? And I have this really cool idea for how we can do that using dung fungus spores to test the timing of the last herbivores.” And he said, “Wow, that’s a really great email. That’s a perfect project, but I’m retiring.” And so, he sent me to his former grad student, Jack Williams, who had just gotten a job. So, two hours later Jack says, “Can you come out next week and interview?” So I went out, and ended up going to the University of Wisconsin for my masters and my PhD. Looking at the role that the extinction of large herbivores played in the development of novel ecosystems at the end of the last Ice Age. And I did a one year postdoc at Brown University, sort of going to my adviser’s old stomping grounds... with the Environmental Change Initiative, another interdisciplinary institute. Actually, I should kinda back up by saying there’s been this interdisciplinary context to everything I’ve done. So, College of the Atlantic has one major: it’s human ecology. It’s this very interdisciplinary degree. And then I went on to do graduate work in geography. Again, very interdisciplinary field. And then I do this Environmental Change Initiative postdoc, which was deliberately set up to be interdisciplinary. So, I had an earth scientist and a conservation biologist...out there. So, when this job opened up here at the University of Maine, it was my dream job. I had known about the Institute since I was an undergrad, and a large part of what drew me to the job was the fact that it’s interdisciplinary, too. And to my knowledge maybe one of the oldest in the country. It’s been nice to be places where that perspective is valued.... Even though I sort of settled in the sciences, I’ve always maintained interest in other disciplines. And I feel like I’m more broadly educated in the humanities than a lot of my science colleagues, so it’s nice to have finally landed someplace that has a little more of that history. Cilli: So, what kind of interdisciplinary work have you done since you’ve come to the Institute?

Gill: That’s a good question. I only arrived in September. So, not as much as I’d like. I’ve got a couple of projects that I’m developing in the Falkland Islands, looking at interactions between sheep, vegetation, abrupt climate change, and sea birds. So, there’s ecology work that’s interesting, but there’s also this element of human livelihoods. And the sheep farmers that are raising sheep on the island are economically and culturally important, and so there are human and environment dimensions to that project. I’m just starting similar work here in Maine. And it’s funny because sometimes scientists think interdisciplinary work it, you know, just a geologist and an ecologist talking together. My hope is also to work with some archeologists or anthropologists in the Institute. We’ve got some great folks here that I’ve started talking about possibilities, looking at the paleoecology of the Gulf of Maine, and how environmental change may be connected to human activity. But I’ve also been talking to Elizabeth Neiman. She and I have a workshop this spring. She’s a professor in English and Women, Gender, and Sexuality Studies. And we are hosting a workshop on gender and knowledge construction, in the humanities and in the sciences. And so, how do gender and identity affect how we know things or why we think we know what we know. So, we’re going to be bringing together scholars from the humanities and the sciences and kind of have this cross-disciplinary discussion. So, who knows what will come out of that.

Cilli: That sounds like that’s a little bit outside your training. You’re sort of bringing your perspective as a female scientist, but you’re not necessarily bringing your expertise to it.

Gill: So, women in science, and science communication, have been interests of mine. I think when we talk about things like gender and science, we’re both coming from the perspective of what are our experiences as people who do science, but there’s also this idea of how gender identity constructs the kinds of questions we ask in science, and the way we confer authority ([or] different lines of evidence) to different kinds of people. So, I think that

diversity is both an experiential thing, in terms of who am I and what am I experiencing as a person doing science, either as a person of color or a woman or a queer person doing science. But also how are the questions we ask constructed by our own experiences. Because, historically, there have been a small set of people asking questions about science, it will be interesting as science diversifies to look at how the diversity of our questions are changing.

Cilli: Could you give a “for instance”?

Gill: In ecology or paleoecology, there are certain kinds of questions that we’re interested in, and we often leave out the human dimension. So, there can be a very imperialistic perspective about ecosystems and what’s natural. For example, we often talk about pre-European contact at the time that we want to conserve things to in the Americas. Well, that sort of erases the experiences of those who were here, living in the landscape, and doing things in the landscape, and influencing the landscape, before Europeans arrived. There’s an idea of environmental purity, and the Indians were at harmony with nature, and sort of this noble savage concept. It’s when Europeans arrived that broke that sense of purity. So, there’s a lot of deeply imbedded racism in those ideas about human relationships with nature.... Another example, as a paleoecologist working with large mammals, I often run into people (a lot of ecologists and climate scientists) who say that it was humans who killed the megafauna. And a lot of anthropologists say that it was climate. Each camp seems to think it’s the other camp’s purview. I think a lot of that has to do with the fact that anthropologists are very savvy to the idea of what it means to say that a group of people who were later subjugated, and really the victims of genocide, caused a mass extinction. There’s a lot of political and social weights that’s given to those kinds of judgments.... I still think that humans killed the mega fauna, but thinking about the ways in which we talk about that is important. And also run into Native Americans who say, “My origin story does not involve coming over the bearing land bridge.” How are you going to deal with that? For me as a scientist, I’m looking at a line of evidence.... Then for someone to come to me and say, “Well, that’s not what I know, based on my own way of knowing.” It’s interesting to think about what it means to do science and to ask certain kinds of questions that are framed by who I am and my identity.

Cilli: In the course of your research have you had much occasion to do fieldwork?

Gill: Yeah.

Cilli: Where at?

Gill: Most of my graduate work was done in the Midwest, the cornfields of Indiana and Ohio and Minnesota. They were very interesting places 15,000 years ago. I’ve done a lot of work in highly-modified and very anthropogenic landscapes. And then most of my field work involves spending a couple of hours on a platform about the size of a picnic table, floating in the middle of a lake. And basically it’s a week in the field, and then we’ll spend a year in the lab working up all the data that we collect. I mostly have worked with sediment cores, although I’ll be doing more work in the future involving vertebrate fossils. Last November, I was in the Falkland Islands for the first time, preparing some projects on the sea bird research that I did before. And also looking at the extinction of the Falkland Islands wolf, which was the first carnivore to go extinct in the historic record. There’s some mystery about when it arrived in the Falklands, and were there people in the Falklands before European’s showed up. Those are really interesting landscapes, because they are so remote. And yet, they’re heavily, heavily influenced by grazing. So, they look very wild and extremely remote.... It’s an

interesting place. It feels like the middle of nowhere, and yet the sheep have done numbers on this landscape.

Cilli: Did you ever find it to be physically taxing?

Gill: Yeah, definitely. The work that I've done with sediment coring is all by hand. Some people use hydraulic coring devices, but everything that I've ever done has been by hand. So, you carry gear to your site. You're assembly things. Once you're out there, there's a lot of rowing and paddling, which I actually like. And the coring itself involves pushing this meter-long tube through many, many meters of water, and then, at the end, through as much as ten or fifteen meters of mud at the bottom of the water. And then pulling those cores back out. Sometimes the pulling out is the harder part. It's sort of hernia-inducing. It's a lot of abdominal muscle work. It's very long, physically taxing, bruise and blister-inducing, sort of work.

Cilli: You said that when you go to the Falkland Islands one of the things you will be exploring is the extinction of a wolf species there.

Gill: Yeah.

Cilli: How will you do that?

Gill: That's a good question. So, there are some fossil remains; we know from the historic record when the last wolf was shot. They were killed by Europeans basically to protect the sheep. They were a predator, in theory at least. There's no documentary evidence I know of, of them actually killing a sheep. It was really quite small, about fox size. We know why it went extinct, and we know when—it was in the mid-nineteenth century. It was observed by Darwin when he visited the island, which is interesting. But one of the questions is when did it get there and how did it get there. Some people have suggested would have walked out on the ice, at the end of the last Ice Age, when the ice was at its max-extent. If the sea ice extended from Tierra Del Fuego, then perhaps this wolf could have walked out on the ice. I'm really skeptical of that idea. We know its closest cousin is used as a hunting dog by the Fuegia Indians. And there's been some evidence of humans being on the Falkland Islands before Europeans arrived. Darwin writes about seeing canoes on the islands. There are some deposits on the island that sound a lot like middens, like trash heaps made by people, with things like giant clam shells and bones. So, it's going to be a matter of finding things that remain, dating the ones that they have at the museum there, and look at the timing of when these things may have showed up. And trying to find more remains, too. Also looking at the charcoal record, to see if there was fire where we don't expect fire to be, and that's usually an indication that people were there.

Cilli: What tipped you off to see what Darwin wrote about it?

Gill: I've read Darwin's work, partly because my undergrad adviser was a big Darwin fan. He always urged us to go back to the primary literature and read Darwin's writing. And then when I was coming to the Falklands I went back to the sections in Darwin's *Beagle*, when he was writing about the Falkland Islands. He has some very not nice things to say about the Falklands; he calls them bleak and desolate, [or] a miserable landscape, or something. Partly because the grass that dominates when the Falklands are grazed is white grass. It never greens up. So, it just looks like brown grass the whole time. So, yeah, it was partly for my own curiosity, wanting to go back and see what he wrote about it. Cause I knew he'd been

there. And partly because it's kind of a claim to fame.... It's hard to go to the Falklands without noticing something that Darwin mentioned.

Cilli: So, when you collect these large peat samples, these cores, walk me through how you analyze them.

Gill: We get the cores, which could be anywhere from two meters long to fifteen meters long or more. They are two to four centimeters thick in diameter, and we take them back in meter-long segments, to the lab. The first thing we do is we cut them in two-centimeter-slices, like cookies. You don't want to worry about the core shrinking or expanding through time, which they'll do. Then those little samples, those little cookies go in a bag, and that's what we subsample from. So, from that little cookie we might take a cubic centimeter and put it in a series of chemical digestions to get rid of the silts, and dusts, and sands, and clays, and all the organic material, all the bits of sludge and gunk. It's a series of acid and base washes that, at the end, the only thing that's left is pollen. And so those pollen-types can be identified to the species or genus or family-level. And that's how you can reconstruct vegetation through time. You can also take another cubic centimeter of that mud and bleach it with hydrogen peroxide and then run it through a sieve and collect all the tiny bits of charcoal. That's how we can tell the fire history, through time, at a given site. You have lots of charcoal, you have lots of middens, you have lots of fire. When you have little, there's very little fire. And there's various other analyses you can do in terms of... for instance, the sea bird research we're going to do will be taking samples and looking for trace elements that are common in guano of these birds. Things like copper, cadmium. You can also look for things like phosphorous (it's very phosphorous rich, guano). The abundance of those minerals can tell you about how many sea birds you have. So, you can start to put all these pieces together. You can look at changes in the climate, changes in the birds, changes in the vegetation. To time the arrival of sheep, for example, we can use spores from a fungus that grows on herbivore dung. So, when you have lots of spores, you know that herbivores have showed up on the Island, or gone extinct (depending on your question).

Cilli: How were you contacted by someone at the Institute? You were nearing the end of your postdoc. Who contacted you?

Gill: My position, which is 50 percent with the Climate Change Institute, and 50 percent with the School of Biology and Ecology, was basically the vacancy left when George Jacobson retired. And so, they hadn't had a paleoecologist doing vegetation, as a faculty member, since George retired. And so, the job had been advertised the year before, and a lap mate of mine (who was a postdoc) interviewed for it. And I applied at the time that it came out, and I was still finishing my PhD, so this would have been in the fall of 2011. Literally, it was my dream job.... Then, I didn't get interviewed, because I was still finishing my PhD. I was like, this is too soon. One of my lab mates, who is a good friend of mine, interviewed for the position.... But, I was in this really awkward moment when I was really hoping for her that she would get a job and also, at the same time, feeling really bummed. She ended up going to UC Merced, and they ended up failing the search. So, it was like the perfect outcome. I applied again the next year. I defended my dissertation in July, I interviewed for the position in October, and I found out I got the job by the end of the year. Again, there was a series of events in my life that kind of clicked. I don't have a very long history with the Institute, but it keeps popping up throughout my career in those funny ways.

Cilli: So, what had you heard about the Institute, or what did you know about it, prior to coming?

Gill: As part of that paleoenvironments class that I took, we did a tour of the building, I think when the ice core lab was still next door. Not the lab, but where they stored all the ice cores. I remember going into the freezer and thinking that was so cool. We did a tour of the facilities, different labs, and sort of learned about different methods used. And Marcus gave us the tour. It's super funny, but I ran into him years later at a conference in Switzerland. I was like, "you probably don't remember me, but I totally do paleo now." It was really nice just to say, "thank you. You sharing your time with me, and your expertise with me, was like a deciding moment, in terms of deciding what I want to do." And that was well before I got the job here... So yeah, I knew about the Institute through the tour. I knew it was interdisciplinary. We visited the archeologists and looked at some of the stuff in the collection they had. We visited the ice core lab, the paleoecology lab. And so, I was aware, in the back of my mind, of the work that was being done here. And I was reading the papers that were coming out of here. George Jacobson's papers were really instrumental. You know, just sort of classic work. Like, he's an eminent paleoecologist. And some of the papers that he did on spruce in Maine, we read in my ecology class. And so, that was important to me. And then of course the ice core and glacier work that's being done here is world-famous. All of us use the ice core that Paul Mayewski has been instrumental in helping to acquire. And so, it's kind of hard not to know about the Institute from that level. You know, as I'm taking Quaternary geology or taking paleoenvironments classes as a grad student [at the University of Wisconsin], we're reading papers written by people here at the Institute. So, it's always just been there. It's one of the big players for this kind of research, globally.

Cilli: What do you think has been the Institute's most important contribution to climate science?

Gill: Can I say two different things?

Cilli: Sure.

Gill: One of them I would say is the interdisciplinary perspective. Forty years ago it was very unusual to have an institution like this that has a biologist, an ecologist, an earth scientist, a climate scientist, working together. So, I think that establishing that as a model for other institutions... From what I've been told, people have used this as a model for designing similar kinds of places. I think [that] was a big deal at the time. So, that's one. The other one, I would say, is the incredible ice core work that Paul and his team have done. Establishing the fact that there are these global climate events, that many of them are abrupt, and helping to establish that there are finger prints of global warming in the modern climate system (based on those ice cores). We see the ice melting now. We see that the ice core record reflects abrupt changes in the past, and that those changes are worldwide. I would say [that] has been a major contribution of the center.

Cilli: Now, how do you feel as the newest and youngest member? Is that intimidating at all? And also perhaps because you're a female, and the Institute is composed primarily of men.

Gill: Before I answer that, can I ask, who's going to listen to this, just out of curiosity? [laughs]

Cilli: It's hard to say. Pauleena and I will certainly listen to it again for our paper.

Gill: I just didn't know if you'd be putting snippets of it on the internet or something.

Cilli: No.

Gill: I'll say that when I came to my first faculty meeting... it's a table surrounded by old white guys. And then there's a ring of chairs around that where everyone else sits. And there was not a lot of women, and it's an older group of faculty, and it's male-dominated. On some levels that wasn't surprising, because those are the rest of Earth Science. But it was one of the more dramatic examples I've experienced in most of my career. Because I'm in ecology as well, and because I'm in the geography department, there was a fairly good gender balance. Having said that, I have not experienced anything but a welcome and warm climate. It kind of gave me pause, walking into that room.... It's definitely new for me. As I mentioned before, I do women in science. It's a big core of my identity, is this outreach work that I do for women in science, and diversity in science. I'm very passionate about it, despite the fact that I don't necessarily have a lot of personal experiences. I couldn't really tell you that "I'm really passionate about women in science because of all the sexism I've experienced."