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Institute for Advanced Study

Oral History Project
Interview Transcript

George Dyson
Interviewed by Linda Arntzenius
November 11, 2010

Institute for Advanced Study
The Shelby White and Leon Levy Archives Center

Oral History Project Release Form

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Linda Arntzenius: It is Thursday the 11th of the 11th, 2010, and I'm here at the Institute for Advanced Study to record an interview with George Dyson[1] about his almost unique relationship with the Institute for Advanced Study, having grown up here and practically born here. I know you were born in Ithaca, but your father became a professor here the same year you were born.

George Dyson: Yes, we moved when I was three months or something.

Linda Arntzenius: The Institute is the focus, so I thought we might start by going back to the very beginning, Freeman[2] and Verena Huber-Dyson[3] [then Verena Hafaeli], your parents. Perhaps you could say a little bit about both, and then move on from there.

George Dyson: Right. They both came here – I would have to look at my notes, but I think Fall 1948. Anyway, it was in the 1948 academic year, they both showed up essentially as post-docs, the class of young people.

Linda Arntzenius: As Members?

George Dyson: Yes, except Freeman wasn't really a post-doc because he hadn't got his Ph.D. Whereas Verena had her Ph.D. in math. They, just by chance, ended up here at the same time. Of course, one of the first things I looked for in the archives here was the records of how they got invited. It was one of these twists of fate that the person who invited Verena had wanted to come earlier but due to one of these academic squabbles that the archives are full of, there was an argument, someone else felt offended by this Professor Reidemeister[4] coming. So he was not allowed to come, and came later. If he had come earlier, he wouldn't have brought my mother at the same time as my father.

Linda Arntzenius: Serendipity.

George Dyson: It was a twist of fate that they ended up here at the same time; a very interesting time.

Linda Arntzenius: Yes. Oppenheimer[5] had recently become the director.

George Dyson: He had moved in and was building this group of young physicists and in the same way the mathematicians were very active.

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[1] George Dyson (1953-), Director's Visitor, 2002-2003.

[2] Freeman J. Dyson (1923-), Member in the Schools of Mathematics and Natural Sciences, 1948-1950; Professor in the School of Natural Sciences, 1953-1994; Emeritus Professor, 1994- .

[3] Verena (neé Haefeli) Huber-Dyson (1923-2016), Member in the School of Mathematics, 1948-1949.

[4] Kurt Werner Friedrich Reidemeister (1893-1971), Member in the School of Mathematics, 1948-1950.

[5] J. Robert Oppenheimer (1904-1967), IAS Director, 1947-1966; Professor in the School of Natural Sciences, 1966-1967.

Linda Arntzenius: So your earliest memories of the Institute are of Crossroads or Fuld Hall or your home or –?

George Dyson: Yes, Crossroads. So to go further, they came in 1948-'49 and then I think both were back again as just short-term visitors. And then they got married and settled at Cornell where Freeman was working with Hans Bethe. From my reading of the records here, Oppenheimer really wanted to bring Hans Bethe.

Linda Arntzenius: Here?

George Dyson: Yes. They were working very hard at that. They tried a lot of people they couldn't get. And Bethe said, "I'm not coming, but you should get this fellow Freeman. He's got a bigger future ahead of him than I do." And so that's how Freeman got offered the position here. That was 1953 just after I was born. I was born in Ithaca and then came here.

It's very hard to make that distinction between what you really remember and what you think you remember because you were told what you should remember. But we lived originally on Dickinson Street. The Institute had a boarding house there, which is still there.

Linda Arntzenius: Really? Which home was that?

George Dyson: I think it's No. 14[6]. That's where they put visitors. Niels Bohr[7] was in there for a while and – again, I have documents somewhere that say what – at any rate, I can remember that.

Linda Arntzenius: You do?

George Dyson: It's the earliest place I remember living. What year they got the house on Battle Road, I can't remember, I think that was probably 1954 or '55 or something. That would be all in the records. My earliest distinct memory is walking down the road here, the hill between here and Battle Road – walking up the hill, which at that time was a steep hill. I mean, the steepest hill within walking distance. And so I was walking home with Freeman. I'd probably been down at the office with him, and I must have just turned three. I remember finding a fan belt by the side of the road. It was a rubber fan belt. And I asked my Dad, "What is it?" and he answered, "It's a piece of the sun."

Linda Arntzenius: A "piece of the sun?"

George Dyson: A piece of the sun, and then he probably tried to explain that to me, but I didn't [understand] – I thought it had fallen from the sun. That was my first realization that my Dad was a little weird or different than – you know - he was a physicist.

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[6] Confirmed by Mr. Dyson as Number 14, in his review of the transcript.

[7] Neils H.D. Bohr (1885-1962), Member in the Schools of Mathematics and Natural Sciences, 1939, 1948, 1950, 1954, 1958.

Linda Arntzenius: When you asked him for an explanation, he went back to first principles.

George Dyson: Right. Instead of telling me what kind of car it came from or what –

Linda Arntzenius: Interesting.

George Dyson: It must have been what he was thinking about at the time.

Linda Arntzenius: Your mother was Swiss and your father was British – English. Did you feel drawn to another country? Did you feel American?

George Dyson: No, I felt totally American. I mean, because you are. If you're born here, you are American. But the community here was very non-American. It was rare to find somebody at the Institute who was actually American, and very refreshing when you did. A few people like Richard Feynman or Ted Taylor, who wasn't here [at IAS], were these rare friends of my father who were American and born here. And that was great. For the kids here, it was sort of like living in a foreign country in a way.

Linda Arntzenius: Right. I wondered if you had spent time in England, if you'd spent time with your grandparents there?

George Dyson: No, very little. I think we went to England twice that I can remember. I've never been to Switzerland in my life.

Linda Arntzenius: And at that time, there was Katarina, your sister, and Esther, your older sister. So there were three of you together.

George Dyson: Right. My mother came – my mother showed up here as a single mom with a, I guess, three-year-old, which was also, I think, incredibly unusual. And then married Freeman and had two more children. So Esther was also older.

Linda Arntzenius: Mm-hmm. And the three of you went to Crossroads. Can you tell me what you remember of that?

George Dyson: I don't think Katarina went to Crossroads. She was older. Yes, I loved Crossroads, and remember it very clearly. It was in one of the old Mineville houses that Julian Bigelow[8] brought down.

Linda Arntzenius: That's like a barracks?

George Dyson: Yes. They called them the barracks, but they really weren't barracks. They were – and it's one of the things I researched in detail for my current book because I was interested in how Bigelow actually managed to do this. Bigelow was also American. He was born 40 miles from here and became a full member here, a permanent member. He could solve any problem. There was this problem in the 1940s, there just was no housing.

[8] Julian Bigelow (1913-2003), Member in the Electronic Computer Project, 1945-1956; Member in the School of Mathematics, 1951-1970; Member in the School of Natural Sciences, 1970-2003.

And instead of all these other plans that were being pursued and were going nowhere, he just said, "Well –" he went up to this town called Mineville, 300 miles north, and bought this whole entire housing project at auction. It was an iron mine that had been built during the war, and after the war, it was obsolete, so the houses were surplus. And they were moved down here to Princeton, [Bigelow] just broke all the rules and solved the problem.

Linda Arntzenius: So he just said, "Let's go get the houses," and -

George Dyson: Right. The Institute would not – it would not be the Institute without that. That's why Oppenheimer could bring the physicists. That's why von Neumann[9] could build the computer. That's why we could bring the meteorologists. That's why the historians had room to –

Linda Arntzenius: A certain dynamism.

George Dyson: Right. It really changed everything having that housing.

Linda Arntzenius: So tell me again about Crossroads.

George Dyson: Yes, so one of these sort of dormitory houses, one was converted to be Crossroads exactly where the school bus stop is now. It was run – really, at that time, it was only for Institute children. The teacher I remember was Mrs. Tomlinson. I came back here once and she was still teaching. She was running the University's kindergarten, and I came and gave a slideshow to the University kids about my kayak trips. I don't know if she's still alive.

But it was run more or less as a co-op. The parents – if your kid was there – I don't know if you paid. But if your kid went to Crossroads, you came and worked a certain – I remember the dads came and built things and the moms took care of kids during the day. And there was one or two teachers.

Linda Arntzenius: Did you walk there from home?

George Dyson: Did we walk there? I think we walked there. Yes, I think we walked everywhere.

Linda Arntzenius: Do you remember the names of any other children?

George Dyson: Well, they're all there in those photographs. The Yang boys were there and Ingrid Selberg, Alice Bigelow – and so it was both the children of the permanent Faculty and the visiting children and all –

Linda Arntzenius: There must have been a lot of children at that time. It was sort of post-war Baby Boom years?

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[9] John von Neumann (1903-1957), Faculty in the School of Mathematics, 1933-1957.

George Dyson: Right. It's very odd being here now. It's quiet. I always remember the housing project just full of kids. I mean, this morning, I saw like three kids walk to the school bus.

Linda Arntzenius: That's a change.

George Dyson: Yes. I think post-docs probably –

Linda Arntzenius: - postponing having children?

George Dyson: Yes. It's sort of – it's too bad. It was a very rich [environment].

Linda Arntzenius: Yes. I also think of this place as welcoming to dogs and children. You see people with their dogs, but less often with children. Interesting. When you went to school in Princeton, can you remember which schools you went to?

George Dyson: Yes. Yes, I mean, every child remembers. I think another reason for Crossroads was that the Princeton Public School system was very bureaucratic about what age you could [begin to attend] – I remember my sister was like three days off on her birthday or something and couldn't get in. Crossroads was the opposite. They would find a place for everyone. But the year I would have started first grade, we went – Freeman went to La Jolla – took a sabbatical to work for General Atomic.

Linda Arntzenius: Is that when he was working on the Orion –

George Dyson: Project Orion, yes. So I started first grade in La Jolla and came back here for second grade at Johnson Park, which was brand new. It had just opened. Esther went to Littlebrook. So I was in on the first year that Johnson Park opened, which really was a Baby Boom school.

Linda Arntzenius: Your father had gone to boarding school.

George Dyson: Yes, from age eight.

Linda Arntzenius: Did he ever think of sending you to boarding school?

George Dyson: No. I think he hated boarding school.

Linda Arntzenius: *[Laughs]* But sometimes people hate boarding school and nonetheless, they still send their children there.

George Dyson: No. He would – I mean - he went out of his way to – I don't think he – well, I did go to a private school in La Jolla because of that same problem. They would not let me into first grade. So he broke the rules and sent me to a private little [school].

Linda Arntzenius: But otherwise, he was committed to public schools?

George Dyson: Yes, very committed and, I think, very disapproving when I sent Lauren to a private school but there were other reasons for that.

Linda Arntzenius: Yes. So tell me what – as a boy - you understood of the Institute? Did you have any inkling of what it was? And I'm thinking before you were ten years old, say.

George Dyson: Yes. The problem is – when you're a child, you just accept the world you're growing up in. That's how you can meet completely normal people who were Cambodian boat people or grew up in refugee camps. Whatever environment you put a child in, they somehow learn to play and be reasonably happy children, no matter what.

So growing up here, we just took it for granted, not that the whole world was like this, but that somehow - this also must be that way for children who grew up in the royal family or something - it's the rest of the world out there, but this place was different. I didn't think about it much till I was older.

Linda Arntzenius: Did you play – pre the age of ten - did you play in the Institute Woods, or did that come later?

George Dyson: I grew up absolutely living in the Institute Woods. That part was just fantastic. It was the social part that was sort of odd, that when you were a child here – a permanent child here - you continually made friends with these kids who were just here for a year and left. It's that way for the children of teachers at a –

Linda Arntzenius: - for people in the military?

George Dyson: Yes, and if your parents are teachers at a school where there's new people every year. So we just – and I say "we" because I think Esther and I –

Linda Arntzenius: Did you form your own little family group or did you have friends that sort of stayed with you year after year? Were there some –?

George Dyson: I didn't have many friends. I made friends with – there was one boy my age, the son of an Italian physicist[10] who became my best friend, but I wasn't very social. You would have said I was socially not very – I didn't fit in well. But I made friends with this one kid, Luca [Radicati], who, of course, was only here for a year. Actually, he might have been here for two years, or he came back. Anyway, he came back later, and, of course, we weren't friends any more. It just doesn't work.

Linda Arntzenius: And did you meet kids in the Woods? Were there other kids playing in the Woods?

[10] Luigi A. Radicati di Brozolo (1919-), Member in the Schools of Mathematics and Natural Sciences, 1959-1961, 1968.

George Dyson: Yes. We knew – the kids who playing the Woods knew each other. They weren't all from the Institute. There were other kids as well. And anyways, at that time, there was still a large community of extremely poor – a sort of a shantytown on the other side of the canal.

Linda Arntzenius: Interesting. Do you recall a house in the Institute Woods that – I think it was pulled down in the '60s – but a black family lived there.

George Dyson: Right.

Linda Arntzenius: I think they were called the Bedfords.

George Dyson: Yes.

Linda Arntzenius: Jerome and Grace Bedford.

George Dyson: There were other families. In fact, I was looking for some other papers here yesterday and there was a great file on the Montgomery's well who were a family living on Institute property whose well had gone bad and –

Linda Arntzenius: That's the house. I didn't know there was a file here. I wish I'd known that. Montgomery's well?

George Dyson: Aydelotte[11] ended up with the responsibility of having to clean these people's well out.

Linda Arntzenius: That's fascinating because the family – the relations of those people - still live here and remember that home very well, going there. It was like going to the country.

George Dyson: Yes.

Linda Arntzenius: They had lived over in the Jackson/Witherspoon neighborhood. I was always intrigued by that. I'll tell you who does remember it, Gaby Borel remembers it because in her first year here, she had Thanksgiving dinner with the family there and thought it was wonderful. I wondered if you had remembered the house.

George Dyson: I remember a farm. I mean a place that had been a pig farm down there. But I didn't remember that house. And we were strictly not supposed to go across the canal, but we did anyway.

Linda Arntzenius: *[Laughs]* You did? Now at that time, if we could go back to when it was basically just Fuld Hall, which was the center of everything - and this is the early '50s and up to the '60s you've got a lot of people crowding into that small space. And the cafeteria's on the fourth floor. Can you paint a picture of what that was like for me?

[11] Frank Aydelotte (1880-1956), IAS Director, 1939-1947.

George Dyson: Yes. It was wonderful. It's always sort of sad to come back and it's not there anymore. Everyone ate on the fourth floor. And it was a real cafeteria. You didn't have all this choice, you had only one thing or another. And it was great. I mean, dinner – people ate dinner there routinely.

Linda Arntzenius: So *families* would eat dinner there?

George Dyson: Yes, families ate dinner there. We – I think it was Esther and I - were partly responsible for [the fact that] Oppenheimer finally ruled no children [were allowed in the dining room].

Linda Arntzenius: Uh-oh. Were you naughty?

George Dyson: Yes, we were –

Linda Arntzenius: Oh, dear.

George Dyson: And then that rule was changed again.

Linda Arntzenius: What did you do?

George Dyson: We used to try and explore Fuld Hall.

Linda Arntzenius: Did you try and climb up to the –

George Dyson: – to the tower, yes.

Linda Arntzenius: Did you succeed?

George Dyson: No. But we definitely disturbed people. We'd drop paper cups down the stairwell.

Linda Arntzenius: Empty paper cups?

George Dyson: Yes.

Linda Arntzenius: Well, at least that's a saving grace. *[Laughs]*

George Dyson: But at that time, yes, everyone was crammed into Fuld Hall. And the library was there and so –

Linda Arntzenius: Did you go into the library, or was that sort of out of bounds?

George Dyson: No. That was off [limits]–

Linda Arntzenius: Yes, that's where people worked and –

George Dyson: Yes.

Linda Arntzenius: Yes. So was there an understanding that there were certain places that were out of bounds and maybe certain times of the day that were out of bounds?

George Dyson: Yes, pretty much everything was out of bounds except going to eat in the dining room. Or going to your father's office if there was a reason to.

Linda Arntzenius: Was the switchboard still there?

George Dyson: The switchboard was there when you came in.

Linda Arntzenius: Did you ever –?

George Dyson: Yep.

Linda Arntzenius: You did that? You played with the – what do you call them?

George Dyson: No, we didn't play with them, but I mean, we would watch what the operators did.

Linda Arntzenius: Caroline Underwood, who was the secretary in the School of Mathematics, said that when she arrived for her interview, Peter Oppenheimer was playing with the switchboard, and she thought "This is very strange." Do you remember him? Was he your peer?

George Dyson: No. He was older, so I don't – I mean, I knew he existed. But they, the Oppenheimers, lived in their own sort of world. They had the fence and horses, and the horses had a terrible reputation.

Linda Arntzenius: What? For being mean?

George Dyson: Yes. One of the horses had kicked one kid and so we were all terrified. They said, "Don't cross the canal," but we did anyway. But we didn't cross that fence where the Oppenheimer horses were.

Linda Arntzenius: Okay. So there were several horses.

George Dyson: I think there were two.

Linda Arntzenius: Two horses. And that was for Toni?

George Dyson: Yes. And one of them was definitely mean.

Linda Arntzenius: *[Laughs]* I saw a picture of Fuld Hall of the Common Room. I think it was taken in the '50s. And you know the linoleum that's in the hallways. That was on the floor in the Common Room as well.

George Dyson: Right.

Linda Arntzenius: Do you remember that?

George Dyson: Yes, oh, yes.

Linda Arntzenius: Did you ever take your roller-skates?

George Dyson: No.

Linda Arntzenius: No? *[Laughs]*

George Dyson: But they had dances there.

Linda Arntzenius: Do you remember that?

George Dyson: I don't remember that. But, of course, again, that wasn't for children.

Linda Arntzenius: Yes, Yes. But, there must have been Christmas parties.

George Dyson: Christmas parties – *[Crosstalk]*

Linda Arntzenius: Tell me about that, what do you recall?

George Dyson: Just standard – they had a big tree. And then one of the – I don't know what we called them then, but now they would almost be called security people, just the all-around take-care-of-everything guys dressed up as Santa Claus. We kind of knew who he was. And there was a present for everybody. Every Institute child had their own specific present.

Linda Arntzenius: With their name on?

George Dyson: Yes.

Linda Arntzenius: Oh, very nice. That was thoughtful. The clock works now. But I know from my own experience, that's quite recent. Was it working then? Do you remember the clock chiming?

George Dyson: I remember – I can't remember – I never remember it chiming.

Linda Arntzenius: Or ticking?

George Dyson: But I think it worked.

Linda Arntzenius: And fires in the fireplace? Was that standard?

George Dyson: The fireplace was still there, but I don't – I know during the war, they used the fireplace.

Linda Arntzenius: So you do think of those times as the "good old days?"

George Dyson: Yes, they were – I mean, they were certainly the good old days in so many ways. And, of course, writing this book about the von Neumann

project,[12] I've kind of been living in that world for years now, so I'm sort of like stuck in it.

But just everything was so unbelievably more open in a way that we just cannot comprehend. I mean, they were doing all this nuclear weapons work here and it was secret, but not the way we do things now. I mean, if someone needed to work on something, they could get cleared in a matter of days. There was a guard and a safe, but to do that kind of work now, the entire place would be sealed off behind Homeland, behind all sorts, of security. It really was such an international center then. People just were showing up from everywhere in the world all the time.

Linda Arntzenius: Oppenheimer – what do you remember personally of him, your personal experiences of him?

George Dyson: Well, he was – to me as a child - he was this mythical being. He was sort of like God or something that people talked about, but I didn't really –

Linda Arntzenius: Was he approachable as an individual?

George Dyson: Not to me. But my father rarely took us anywhere. My mother would take us to people's houses. I remember going to Gödel's[13] house and so on. But my father was very much - usually you just leave the kids at home. So we didn't – I'm sure we would have been welcome going over to the Oppenheimers - but we didn't.

I don't actually remember going in the Oppenheimer – I mean, I still think of it as Oppenheimer's house, but I don't remember going in there except maybe once. I think once I went there with my sister, who was friends with Toni. But, no, Oppenheimer just was this more or less invisible ruler of everything. So I imagined him, again, like he – you always imagine God is gonna be seven feet tall. And then in 1966, when he became ill and retired, then he moved in next door to the house across our hedge. It would have been Yang's[14] house. And then I was just like shocked. Here was this little frail guy.

Linda Arntzenius: Shame.

George Dyson: But –

Linda Arntzenius: You mentioned Gödel. Tell me what –

George Dyson: I don't remember anything about him –

Linda Arntzenius: No, you don't?

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[12] Dyson, George. 2012. *Turing's cathedral: the origins of the digital universe*. New York: Pantheon Books.

[13] Kurt Gödel (1906-1978), Member in the School of Mathematics, 1933-1935, 1938, 1940-1953; Professor, 1953-1976; Emeritus Professor, 1976-1978.

[14] Chen Ning Yang (1922-), Member in the Schools of Mathematics and Natural Sciences, 1949-1954; Professor, 1955-1966.

George Dyson: – except going –

Linda Arntzenius: Do you remember his wife?

George Dyson: Yes, I remember we went for tea at his house or something.

Linda Arntzenius: Now she was from Vienna.

George Dyson: Yes.

Linda Arntzenius: So it must have been a good tea.

George Dyson: Yes. But I was too young to remember. I very much disliked those – not to stereotype - but there seemed to have been a lot of them in my childhood - German women who thought I needed to eat more. I was a scrawny little kid who looked like my mother wasn't feeding me enough.

Linda Arntzenius: Interesting. It would be rather formal, too, perhaps?

George Dyson: I don't think it was formal, but I think – anyway, I mean, I have my own ideas about Gödel, but they're not firsthand. They're just from reading his papers.

Linda Arntzenius: Ulli Steltzer. Do you remember her?

George Dyson: Oh, yes, she became a really good friend.

Linda Arntzenius: When you were teenager? Did you know her then?

George Dyson: Yes. We both moved to Vancouver at the same time.

Linda Arntzenius: Oh, really? I didn't know that.

George Dyson: Yes. So we became very close in Vancouver.

Linda Arntzenius: I read that she – or she may have told me, I think, that she sort of took Peter Oppenheimer under her wing for a time, and he was interested in photography. And another man that I met from the Jackson Witherspoon neighborhood, his brother, Roderick Pannell, was also interested in photography and she encouraged him too.

George Dyson: Yes.

Linda Arntzenius: So I think she's quite an attractive personality.

George Dyson: Yes. She's remarkable. I introduced her to – because she came to Vancouver and at that time, I was going up and down the coast there – and I told her she needed to look at that - and she did. She ended up doing a book on the strange people who live on these isolated parts of the British Columbia coast.

Linda Arntzenius: Oh, I had no idea that you and she had this sort of relationship that went on beyond Princeton.

George Dyson: Yes. We ended up in Vancouver. I don't know how I – probably Freeman said she should look me up or – anyway, somehow we ended up being on similar paths there in Vancouver.

Linda Arntzenius: Well, before we get to Canada, though, I wanted to ask about Helen Dukas and her encouragement of you as a young teenager.

George Dyson: Yes. That was almost, I think, before being a teenager even. She was the baby-sitter for my younger sisters, when Freeman remarried and had four young girls. Helen – I'm sure you know lot about her - had no children, and somehow in sort of a Mary Poppins way, she kind of adopted these kids – she enjoyed coming over. It was a very regular thing, once a week she came and took care of the children. Esther and I were old enough to not need taking care of, but she still felt responsible for us.

So I remember – I have to figure how old I was - I would have been young because I had not read a grownup book yet. I'd only read like Dr. Seuss books and stuff. And I think I was making her life miserable being bored or whatever. She told me I should read: why didn't I settle down and read a book. And I said, "There's nothing to read. I've read everything." And she said, "That's not true. Read this."

And she pulled down *Kon-Tiki*, a copy of *Kon-Tiki,* which was in the grown-up books, that I didn't look at. And I read it, and it was phenomenally interesting to me. So that – the Kon-Tiki voyage was 1953, so it was still pretty fresh. So that was the first adult book I read.

Linda Arntzenius: Was it after that, you tried to build your own Kon-Tiki?

George Dyson: No, but slowly - I mean, it put the seeds in my mind - anyway, she was a lot of fun and she had an endless collection [of games and puzzles]. Any company that made some new game or puzzle, would send a copy to Professor Einstein.[15] It was just something you did. The '50s were full of that kind of stuff. People were really trying to exercise their minds and be smarter. The companies were very competitive, inventing new games.

Most were total failures, there's just the few things we remember. Anyway, they all sent these to [Professor Einstein] – so they ended up with Helen who kept them at her house – it was a cupboard that was full a this stuff. And if you were really nice to her, she'd give you something out of that cupboard.

Linda Arntzenius: I read that you built or first canoe at 13 down on the Stony Brook.

George Dyson: Well, Yes. I built it in the house on Battle Road. I started it when I was 12.

[15] Albert Einstein (1879-1955), Professor in the Schools of Mathematics and Natural Sciences, 1933-1946; Emeritus Professor, 1946-1955.

Linda Arntzenius: Really?

George Dyson: Yes.

Linda Arntzenius: And you built it in your room?

George Dyson: I built it in my bedroom, yes.

Linda Arntzenius: Why did you build it in your room?

George Dyson: Beause my father wouldn't – most normal dads would say, "Great. You can use the garage." But he just –

Linda Arntzenius: Why weren't you allowed to build it in the garage?

George Dyson: I don't know. I mean, I really don't understand, 'cause they had a two-car garage.

Linda Arntzenius: It seems a rather odd place to build a canoe, in your bedroom.

George Dyson: Yes, yes.

Linda Arntzenius: How did you get it out?

George Dyson: Through a window. But –

Linda Arntzenius: *[Laughs]* Oh, dear. And was it Stony Brook worthy?

George Dyson: Yes. It was great. I ended up selling it 'cause there was nowhere to go in it really.

Linda Arntzenius: Well, Lake Carnegie.

George Dyson: Yes, I did that. Now I would paddle to the ocean. But like I said, I didn't –

Linda Arntzenius: Well, you could have gone along the canal to the Raritan.

George Dyson: Yes, you could. Right, I just didn't really realize that. So that was sort of an anomalous thing.

Linda Arntzenius: As a teenager, I guess you went to Princeton High School?

George Dyson: Yes.

Linda Arntzenius: Okay. So now where are we? We're right in the '60s.

George Dyson: Right.

Linda Arntzenius: Okay. That must have been a very interesting time at the Institute – we're coming into the Vietnam War – the hippie period.

George Dyson: Right.

Linda Arntzenius: Tell me a little bit about that, what Princeton was like in those days.

George Dyson: Yes. Very polarized – and polarized in a lot of ways that I don't think get much attention. There were all these different factions here. Obviously, racially polarized in a way. Princeton was very segregated at that time.

Linda Arntzenius: That didn't impact the Institute, though, did it, in any way, or did it?

George Dyson: It didn't. But it did if you were a teenager and you went outside the Institute and had friends in Princeton. And then there was also a tremendous divide between the high school students and the university students who essentially hated each other. You could blame both sides. I think there were some pretty uncivilized university students and some pretty uncivilized high school students as well. So there was a lot of, a lot of tension there.

Linda Arntzenius: How did it show itself?

George Dyson: Of course, to people like me, it seemed incredibly unjust that the university students could freely get away with things that the high school students would really get in trouble for like drinking and so on, which are sanctioned at the university, but highly –

Linda Arntzenius: - censured?

George Dyson: Censured for high school students. So if you're from the Institute, you were sort of in totally left field. You didn't really belong to any of those groups. And then when the Vietnam War began, it was so polarized, we had all these defense institutions here – IDA and –

Linda Arntzenius: You'll have to spell that out for me.

George Dyson: Institute for Defense Analysis.

Linda Arntzenius: Okay. In what sense were they here?

George Dyson: Well, they were here in Princeton –

Linda Arntzenius: In Princeton. Okay.

George Dyson: – working very actively for the –

Linda Arntzenius: - government.

George Dyson: – Pentagon, yes. And I think we still don't know all the agencies that are really here –

Linda Arntzenius: But had they a relationship with the Institute?

George Dyson: No but with the University. I remember going – as high school students, we knew how to sneak in everywhere - and I remember sneaking into I think it was Murray-Dodge Auditorium and hearing Cassius Clay/Muhammad Ali give a talk against the war. He was very charismatic. I also remember Madame Nhu coming, before the war. And there were protests against her even.

Linda Arntzenius: So the Princeton High School students would sneak into these events that the student union, presumably, had invited these speakers to speak on campus.

George Dyson: Right.

Linda Arntzenius: And there would be divisions on campus, presumably generational, as to whether this was a good thing or not.

George Dyson: Right.

Linda Arntzenius: The Princeton University students could do this, but the high school students would get into trouble from their parents because they were under 18 and had to toe the line?

George Dyson: Yes. So, anyway, we sort of were on the fringes of all that.

Linda Arntzenius: Right. You've said to me before that you did not graduate from Princeton High School. And it's almost like a little badge of honor *[laughs]*. What did you daughter think about that when she was going to Princeton High School?

George Dyson: Well, she was going to [John] Witherspoon [Middle School]. She didn't stay for high school.

Linda Arntzenius: Oh, she didn't.

George Dyson: Yes. She always thought that was odd. But I think she understands.

Linda Arntzenius: What was the reason for that?

George Dyson: I was just bored and impatient. And I did all the work. It's not as black and white as [all that] – it's nice to just say, "Well, I got disgusted and left," but actually what I did was I realized that I could fulfill all the requirements in three years. And I had been to jail in Trenton for a week.

Linda Arntzenius: Mm-hmm. You are going to have to explain that.

George Dyson: Right. But anyway, when I got out of jail – which was also unfair – then all the teachers were willing to bend the rules to help because they wanted to help this poor kid who's gone astray – so when I got out of jail and decided, "Okay. I want to get finished next year and leave a year early," they were all cooperative.

I was allowed to take two English classes at once. I took Honors English 12 and English 11 at the same time, which is not hard to do. So it looked like I was going to graduate. But then we had an assistant principal, whose name I won't mention, and he totally put a stop to that. He said, "No. You can't graduate without four years of PE." So that's why I didn't graduate.

Linda Arntzenius: PE? Oh, Lord.

George Dyson: It irritated me enough I didn't care. I just left. But Princeton High School was great. I mean, now in hindsight - because I've seen other high schools – I realize what a good job they were doing.

Linda Arntzenius: So PE was a stumbling block. And jail may have been something of a stumbling block. Can you explain what happened there?

George Dyson: Yes - that's in the *Atlantic Monthly* this month - it's really weird.

Linda Arntzenius: Oh, really?

George Dyson: There's an article about Freeman and it brings it all up. It's by a writer who didn't talk to Freeman. I was a teenager and –

Linda Arntzenius: How old were you?

George Dyson: I was 14. And my mother, by that time, lived in Berkeley. So I was going out to visit her.

Linda Arntzenius: Was she teaching at Berkeley?

George Dyson: She was teaching somewhere else, actually, but she was living in Berkeley. In the math department there. At that time, lots of drugs were starting to show up.

Linda Arntzenius: This is 1967? The summer of love…

George Dyson: Yes. Yes, '67, yes. Right. So I think the authorities here were very threatened. All these drugs are showing up and where are they coming from.

Linda Arntzenius: Right.

George Dyson: And I was going –

Linda Arntzenius: - quite regularly?

George Dyson: Yes. I was going to Berkeley over Christmas and in the summer. I wasn't dealing drugs. I don't know if I would have loved to, but I certainly didn't have any.

Linda Arntzenius: But it certainly looked like the route?

George Dyson: But I think what happened is, I think somebody turned me in. I mean, I think they caught somebody and said, "Who is –?" and someone said, "Oh, it's George."

Linda Arntzenius: "He goes to Berkeley every year."

George Dyson: Yes. Anyway, they decided I was a threat.

Linda Arntzenius: Were you the California connection?

George Dyson: Yes. So anyway, they went to our house and my father just let them in. Didn't say, "Do you have a search warrant?" or anything. And they claimed to have found something, but they couldn't have. So it's all very suspicious. I mean, they could have found evidence that I *had* smoked marijuana at one time, but they couldn't have found any because there wasn't any there. But that didn't really matter at that time. They came and got me out of high school in handcuffs and took me to Trenton. I was in jail for a week.

Linda Arntzenius: Did you have long hair?

George Dyson: Yes. I had long hair. Yes. In many ways it changed my life much for the better because I had been just this completely misfit, un-respected kid with no circle of friends or anything. And then after that, I had gained huge respect. Nobody had been taken to jail for a week.

Linda Arntzenius: A week is a long time.

George Dyson: It is a long time. This was jail in Trenton, so there was only one other white kid in jail who was an Italian who had stabbed his teacher.

Linda Arntzenius: So you were with other people in a –

George Dyson: Yes, basically a youth jail, but in Trenton so other than these two white kids, it was all black kids. It was a pretty well run place. It wasn't brutal or anything. But the expectation is if you're a kid from Princeton, your parents come get you out right away. It's just supposed to show you that there's consequences. But for some reason, Freeman didn't – he just thought this was my problem. It wasn't his job. So he didn't come get me out. Finally, Esther – my sister, Esther, I think - asked where I was or something – Then after a week, they did get me out.

Linda Arntzenius: So you could have been in there for longer.

George Dyson: I don't know what they would have done. I mean, they probably would have made me a ward. My mother didn't know, which was also sort of unfair. When she found out, she got pretty upset.

Linda Arntzenius: Oh, my.

George Dyson: But the problem was it left me with no respect for authority because it was so clearly unjust and unfair and not legal. So that was the bad consequence. I went through a lot of the rest of my life just very much disrespecting the legal system, which now I do respect. But it has nothing to do with the Institute, other than that the driver here – now what's his name, Gary – who I think just finally retired –

Linda Arntzenius: Yes, Gary Alvin.

George Dyson: He, of course, remembered all that. I'm sure this was scandalous at the time. When I came back – to give one of the big talks here where they sent the driver to pick me up - he just thought it was a mistake. He said to me, "What are you doing here? Last I remember you, you were in jail in Trenton."

Linda Arntzenius: *[Laughs]* That's a good story.

George Dyson: Yes.

Linda Arntzenius: That's wonderful. Oh, well.

George Dyson: He was a great guy.

Linda Arntzenius: The prodigal son returns.

George Dyson: Yes. Those people who really made the Institute the Institute don't get enough credit or appreciation.

George Dyson: Have you interviewed him?

Linda Arntzenius: Yes. In fact, he gave me a lot of photographs for the book [I've been working on]. So he's in the book quite prominently. *[Laughs]* In fact, someone said, "Who is this Gary Alvin? He's all over the place." *[Laughs]* I was very grateful to him because I wanted the other story told, too. But in some respects it was difficult to get photographs. For example, there's a wonderful woman, Shirley Satterfield. Her mother, Alice Satterfield, lives in the Jackson Witherspoon neighborhood. Alice, worked in the cafeteria and would walk home with Einstein, and he would hold her hand.

George Dyson: Alice Rockefellow?

Linda Arntzenius: Alice Satterfield.

George Dyson: Satterfield. There was an Alice Rockefellow.

Linda Arntzenius: Don't know her. But, there was a picture, and I saw it in another book, of Alice Satterfield at the Institute with her peers. But Shirley lost it. I wanted it for the book, but Shirley lost it. She gave it someone and never got it back. These things happen.

Another question I wanted to ask you – Kaysen's daughter? [Susanna Kaysen] *Girl Interrupted*?

George Dyson: Right.

Linda Arntzenius: Did you know her?

George Dyson: No. I think she went to private school. There was a tremendous gulf between the people who went to Princeton High and the people who went to PDS [Princeton Day School] or the Hun School or those other schools. Probably still is. I think she went to PDS. I'm not sure.

Linda Arntzenius: You didn't graduate from Princeton High School, and your father famously never got his Ph.D., but that didn't seem to matter. You've written two books, three books?

George Dyson: Three books[16].

Linda Arntzenius: Three books.

George Dyson: Four books, if you count -

Linda Arntzenius: Ah yes - the one on the way. I want you to speak a little bit about the challenges of working as *independent* scholar. I'm thinking about access to libraries and grants and the Institute, for example.

George Dyson: Yes. I've never really had much access to grants, but I haven't tried. The rest of it is sort of in a way, if I look at it rationally, you are imprinted as a child. It's hardwired going back to pre-humans, you're imprinted by the behavior of your parents, it's how we survived before we had written culture and so on. So that's incredibly strong.

It haunts a lot of people who end up trying to *not* be their parents. It clearly was that way for me. As far away from here as I tried to get, I ended up pretty much doing exactly what people do at the Institute most of my life – even though I've worked as a boat builder and survived doing totally different things, I spent a lot of my time just researching the things that interest me.

Linda Arntzenius: Mm-hmm. But as an independent scholar, you don't have the resources of an institution, a library. Isn't it more difficult?

George Dyson: It is more difficult. But then on the other hand, you don't have faculty meetings and grant applications and all the – I mean, the purpose of the Institute exists really to try and get these worthy scholars to where they just simply have room to work on what they want to work on. And my attitude was, "Well, I can do that anywhere. I mean, I can do that in my tree house in British Columbia," which is what I did, really. I read all these

[16] *Baidarka the Kayak*, George B. Dyson, Alaska Northwest Publishing Company, 1986; *Darwin Among the Machines: The Evolution of Global Intelligence,* George B. Dyson, Addison-Wesley Publishing Company, Inc., 1997; *Project Orion: The Atomic Spaceship 1957-1965*, George B. Dyson, Henry Holt and Company, 2002.

journals. I always managed to have access to a library. The good thing is that libraries, even if they're like Firestone, which was closed to the public, there's always a way to sort of – which was what I did in high school, was sneak into Firestone[17]. So I've always been very good at that. Now, of course, the Internet has changed everything. Everybody has access to a library.

So there really is no reason you can't do what a lot of people at the Institute do somewhere else. It works here particularly well and, of course, when you have groups – Oppenheimer brings a group of physicists who share an interest in a big problem. But for the sort of lone historian - which is probably why I do history, history's one of the few things where lone amateurs can still make serious contributions.

But it's a mixed thing. The year I was here as a visitor, it was absolutely wonderful to realize, "Boy, there's ways you can actually be – I'm not sneaking into the library - I'm supposed to be here." But it was also kind of disorienting, and I'm not used to that. I've done all my work kind of squeezing it in. I took that fork in the road and I can't look back. If I'd stayed and become an academic, who knows, I might be a very unhappy academic. I don't know.

Linda Arntzenius: But you are associated with a university?

George Dyson: I'm not, really. I was. In this little town I live in, there is a university. And for a while, I was associated and now, I've just sort of drifted.

Linda Arntzenius: So you don't teach?

George Dyson: No. I did. For a couple years, I taught sort of history of technology. And it was fun, but I don't need to do it. So I really have no affiliation now except loosely here.

Linda Arntzenius: Now then we can perhaps move on to the book that you've just finished on von Neumann and the ECP [Electronic Computer Project]. And perhaps you might explain how it was that you came to be so fascinated with von Neumann.

George Dyson: Well, I was fascinated with von Neumann as a child, largely through Julian Bigelow, who was the engineer here, and as I said, an American who grew up 40 miles from here. He was the guy who fixed his own car and fixed other people's cars and moved the housing project here. He was my hero, this guy who built things.

He built the machine for von Neumann. And then, of course, I grew up, probably at age eight, sneaking into that barn[18] where all the leftover

[17] Dyson writes about Princeton University's Firestone Library, his "love of libraries, and fear of librarians" in his book *Darwin Among the Machines.*

[18] Dyson recalls the Institute's barn and its contents in the chapter "Rats in a Cathedral" in his book *Darwin Among the Machines.*

computer junk was. Julian never threw anything away, and that machine was really built from junk – it was built from war surplus parts.

We would sneak in there and play with that stuff. I had always been utterly fascinated by this machine that had been built here. And I knew was what it was. I knew it was a computer, and I saw how computers became more important in the world, and always felt that there was this great untold story of what had happened here.

Because the Institute actively for a time - didn't conceal what had happened but the archives were closed and soon after von Neumann died the project was shut down. There were reason for shutting it down, but it wasn't done very well. So that story always fascinated me.

Linda Arntzenius: Could anything else have happened with it? Could it have gone to the University?

George Dyson: It did go to the University – it was given to the University, but they couldn't really keep it running. But no, the whole idea of a center for pursuing computing for the sake of science – that's what von Neumann wanted to do. And it would have set the world many years ahead if they'd kept it going. They squashed this thing right when it was really getting exciting.

Linda Arntzenius: Why do you think that was? Was it lack of understanding as to the significance –?

George Dyson: It's very complex and my book tries to give a fair picture of what happened and how and why and –

Linda Arntzenius: People have said, "Well, it's was a wonderful thing, but not for the Institute."

George Dyson: Yes. And there's merit in that. On the other hand, it was working well and there's no reason not to have a - if they had kept four to six people here working on that field - there was a lot going on.

Linda Arntzenius: Can I ask you to speculate for a moment on what he might have done had he lived?

George Dyson: Von Neumann? Oh, well, he was as going to leave the Institute. He was fed up. He had accepted a position as professor at large for the University of California, where they were giving him his – I mean – everything he ever dreamed of, his own lab. It would have been at UCLA. This whole genetic revolution might have happened 10 or 20 years sooner. He was going to try and combine computing and genetics and solid-state electronics and – and the military stuff. He was there – he had the full support of –

Linda Arntzenius: There's a quote in your book – if I can find it. In *Darwin Among the Machines* you write, "Everything that human beings are doing to make it easier to operate computer networks is at the same time, but for different

reasons, making it easier for computer networks to operate human beings."

My understanding of this is that in the way that dog and man developed this symbiotic relationship, are you saying that computers and man are evolving a similar symbiotic relationship?

George Dyson: Yes, I mean, completely –

Linda Arntzenius: Whereas it was man and dog, it's computer and man?

George Dyson: Right. And every year it's computers and children. I mean, every year, it's moving. When I wrote *Darwin Among the Machines*, there were no such things yet as wireless networks, but you could sort of see that coming.

Linda Arntzenius: So you're even more convinced about what you wrote in that book about the evolution of global intelligence –

George Dyson: Oh, yes, completely. You can't separate people from their iPhones now, and everything is there. The entire Internet is on this – is in their hand for good and bad. I'm still trying to figure out what I'm going to say after dinner tomorrow night to the social scientists. But I think that's it's the legacy of what von Neumann did here that needs the social scientists to keep track of it. What are the effects of this on society as a whole?

And what happens to history when you remember everything? The practice of history as it's done here is [that] you find these scraps of material that have been saved. And now we're living in a world where almost nothing's being erased any more. It's going to be a very different kind of history.

Linda Arntzenius: Do you think of yourself as a visionary?

George Dyson: Do I? No. I mean, I had visions, but not –

Linda Arntzenius: Have people described you as a visionary?

George Dyson: I don't know, maybe. I don't – I think it takes 50 years –

Linda Arntzenius: You'd have to be 50 years older? *[Laughs]*

George Dyson: Yes. Perhaps in 50 years people will go back to *Darwin Among the Machines*, and say, "Oh, this was really prophetic." But it's too early.

Linda Arntzenius: All right. Well, let's go back to *The Starship and the Canoe*, because it makes much of the difference between father and son and I wondered if you could tell me a little bit about that period in your life – not to make too much of your relationship with Freeman, but a little bit about that period, and, perhaps, what impact the book had on your career as a writer.

George Dyson: Yes. The book. This is a book that very much stereotyped Freeman and myself as to Freeman being the sort of calculating scientist and me being the anti-scientist and the rebel. So, of course, it had the opposite effect. If you're really rebellious and you are stereotyped as being anti-science and rebellious, you're going to then go to the other way.

So I think that book, in a way, is what turned me back into writing books about Project Orion or von Neumann's computer project as well. I could have built kayaks for the rest of my life. But the book – what's interesting about that book is that it's – the story is there, but it's how you interpret it. So in America that book was cast as this story of the battle between the opposing generations.

It was translated into Japanese, and it became much more popular in Japan, and it even became a film in Japan. There they saw it in absolutely the opposite way, that here are these very different father and son on the same path in life. They saw it in a much more harmonious way. And maybe that's because in Japan, it's unthinkable to truly rebel against your father.

Linda Arntzenius: Freeman's often been described as rather contrary and you're suggesting that you've got a bit of that, too.

George Dyson: Yes. Yes. I don't necessarily agree with Freeman about climate change, but I understand why he – I think he should be allowed to question – that's what this article just out in *Atlantic* is by Kenneth Brower, who wrote *Starship and the Canoe*, pretty much attacking Freeman for his global warming views, and I think unfairly. But I see both sides.

Linda Arntzenius: What impact did growing up at the Institute have on you? I'm thinking of perhaps expectations you may have had or conception of the world at large, and perhaps even if it set you up for disappointment in any way.

George Dyson: Yes. I think most of the conversation's been about the impact of the Institute. Obviously it makes you sort of live in this world of ideas, where ideas are important. I don't think I was disappointed. In fact, in a lot of ways, I was almost the other way, that when I ended up going to live in these communities in British Columbia that had no cars, at age 17, and drinking a lot with loggers and people like that – I found that they – many of them had just as many deep thoughts about philosophy and the meaning of things as the people who were paid to sit here and think about the same stuff.

It's really kind of a universal – there's people who are intellectual everywhere. The Institute is a place that tries to cultivate that in a different way, but –

Linda Arntzenius: Did it provide you with any *resources*?

George Dyson: Resources. Not 'til I came back here, which was a complete surprise. I never expected to come back here. And then truly out of the blue one day, here was this letter saying, "You're invited to be a Visitor for a year.

Linda Arntzenius: So that surprised you?

George Dyson: Yes.

Linda Arntzenius: That came from Griffiths?[19]

George Dyson: Yes, Griffiths was director. But it was certainly not driven by him – I think I know who was responsible. It was someone who gave an anonymous donation under the condition that this von Neumann material should be looked at more carefully, and recommended that I was obviously the person [to do that].

Linda Arntzenius: Excellent.

George Dyson: Yes. I think I know who that was. So that's how that happened.

Linda Arntzenius: Have you asked this person? You haven't had confirmation?

George Dyson: No, but it's pretty clear. I think it was Charles Simonyi. I had shown him the material. I had happened to be here during a trustees meeting, just by chance. I had found this material and then someone else – Jennifer Chayes[20] – said, "You gotta show this to Charles." So she grabbed Charles and he came out of the meeting. We took like 15 minutes and went and he just said, "Well, this is –" 'cause he's Hungarian.

Linda Arntzenius: So he saw the log books and the –

George Dyson: Yes.

Linda Arntzenius: That's fantastic.

George Dyson: That's how that happened.

Linda Arntzenius: And that gave you nine months or whatever to be here?

George Dyson: Right, to really go through it thoroughly, yes.

Linda Arntzenius: Maybe we could focus now on some of the personalities that you've come across. You mentioned Feynman. I know Dirac[21] was here. Cecile

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[19] Phillip Griffiths (1938-), Member in the School of Mathematics, 1968-1970; Visitor, 1981-1982; IAS Director, 1991-2003; Professor, 2004-2009; Emeritus Professor, 2009- .

[20] Jennifer Chayes (1956-), Member in the School of Mathematics, 1994-1995, 1997.

[21] Paul Adrian Maurice Dirac, Member in the Schools of Mathematics and Natural Sciences, 1934-1935, 1946-1948, 1958-1959, 1962-1963.

Morette-Dewitt.[22] Bigelow, you've mentioned. But maybe we could go through a few and you could give me some little sort of vignettes or memories associated with those – yes?

George Dyson: Yes, if I remember them.

Linda Arntzenius: Veblen.[23]

George Dyson: I don't remember Veblen at all. I know him really well now. He's a major character in this book and I think people don't realize how much the computer project was really his – not his idea - but he encouraged it.

Linda Arntzenius: Von Neumann, you don't remember.

George Dyson: He died when I was three.

Linda Arntzenius: Now that's funny, the big ones – the ones that you are so enamored of now, you –

George Dyson: Yes. I'm not necessarily *enamored* of them. I mean von Neumann, I'm writing a book about him and have incredible respect for him but I don't know him well enough to like him.

Linda Arntzenius: Really?

George Dyson: Von Neumann was clearly not the sort of person I think I would really like, but had, obviously, a phenomenal impact on the world.

Linda Arntzenius: So who else stands out in your memory?

George Dyson: The people here?

Linda Arntzenius: Mm-hmm.

George Dyson: Not many. Again, because we didn't associate that much with – my mother was much more social with the mathematicians. The physicists tended to go for a lot of walks. They really did their physics by going walking. So there were all the standard people – the Yangs and the Lees, and Hans Bethe. I remember him well. But, again, he was more of really a family friend. He's my sister's godparents. And the Josts.[24] These were all people who my father worked with closely, you ended up seeing them.

Linda Arntzenius: Lily Harish-Chandra?

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[22] Cécile DeWitt-Morette (1922-2017), Member in the School of Mathematics, 1948-1950.

[23] Oswald Veblen (1880-1960), Professor in the School of Mathematics, 1932-1950; Emeritus Professor, 1950-1960.

[24] Res William Jost (1918-1990), Member in the Schools of Mathematics and Natural Sciences, 1949-1955, 1957, 1962-1963, 1968.

George Dyson: Yep. They were our neighbors, so yes. I remember them very well. And their daughters were – I think the older daughter's a little older, and the younger daughter's a little younger. I've seen them again a few times.

Linda Arntzenius: And what about the Morse children? Any of those your age?

George Dyson: No. They're all older, too, so I didn't know them. Panofskys – I mean, they all lived there, but were very – I remember Mrs. Beurling was very nice to Esther. She liked Esther. Karin Beurling.

Linda Arntzenius: Arne Beurling?[25]

George Dyson: His widow was, until recently, still living across the street on Battle Road. I think quite ill. He was an amazing guy. There were many people here who really, really had done [interesting things] – I think part of the problem is that Princeton is such a sort of dull and boring place, it's hard to imagine that – or it was hard for me to imagine that - people were here who had done such interesting things. He had broken the German codes in Sweden during the war, and then just quietly lived here the rest of his life.

Linda Arntzenius: How do people do that? Like the von Neumanns coming from Vienna and Gödel and his wife, and then coming to – I know there were reasons for getting out of Europe obviously - but it [Princeton] must have seemed such a backwater to them.

George Dyson: Yes. Well, they kept moving around. I mean, von Neumann just kept traveling all the time. He was rarely here and then was planning to leave. He felt very loyal. He felt that Veblen had saved his life bringing him here, that he couldn't leave. But then he did finally decide to leave. There's a book about Beurling that I read recently. And apparently, he was very ambivalent. Partly, he didn't want to stay here.

Linda Arntzenius: Mm-hmm. Did your father ever think of leaving?

George Dyson: I don't know. I found it just inconceivable that he came back after moving to La Jolla when I was in first grade. It was just paradise. I mean, La Jolla in 1958 – and they would have given him anything. If he'd said, "I'm not staying unless I have three swimming pools and –" they would have found a house with three swimming pools. But he came back. So, no, I think that's a subject of – I think Imme would very much like to retire somewhere out in California where three of her four children are.

Linda Arntzenius: Well, they've got time yet.

George Dyson: Not – not a lot. He's been in the same house for 57 years.

Linda Arntzenius: That's your entire life.

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[25] Arne Beurling (1905-1986), Member in the School of Mathematics, 1952-1954; Professor, 1954-1973; Emeritus Professor, 1973-1986.

George Dyson: Yes.

Linda Arntzenius: All right. Dirac.

George Dyson: I don't remember Dirac at all.

Linda Arntzenius: Who is Bryce DeWitt?[26]

George Dyson: He, I remember well, because – I think he was another one of these Americans.

Linda Arntzenius: Is he a mathematician?

George Dyson: He's a physicist and a very unusual case in that he was married to Cecile Morette.

Linda Arntzenius: Oh. I didn't know that.

George Dyson: She became Cecile Dewitt. I think they split up but for a long time, they were the rare case of a sort of functioning working couple of equals. She's still alive. She's great.

Linda Arntzenius: Yes, she is. Did you read Graham Farmelo's[27] book on Dirac?

George Dyson: I have it, but I have not read it.

Linda Arntzenius: What about John Bahcall?[28] Do you remember him much?

George Dyson: Yes, very well. I actually interviewed him when I was here, and it was a difficult interview because it was at lunch. But, anyway, I got what I wanted. He's the astronomer who brought computing back to the Institute. When they shut the von Neumann project, there was no computer here until I think like 1966 when he started doing numerical [work here].

Linda Arntzenius: When did he come – '71 I think he came.

George Dyson: Okay. So it was even later.

Linda Arntzenius: So he brought astronomy and particle physics together and that needed computing power?

George Dyson: Yes.

Linda Arntzenius: Yes, a very interesting man. So didn't that sort of make you think, "Oh, I want to be a physicist"?

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[26] Bryce Seligman DeWitt (1923-2004), Member in the Schools of Mathematics and Natural Sciences, 1949-1950, 1954, 1964; Member in the School of Natural Sciences, 1966.

[27] Graham Farmelo (1953-), Director's Visitor, 2005-2007, 2009-2015, 2017.

[28] John Norris Bahcall (1934-2005), Member in the School of Natural Sciences, 1969-1970; Professor, 1971-2005.

George Dyson: No. I mean, at that time, I just wanted to get away. But he was very good for the Institute. Still the only people you'll see working at night are the –

Linda Arntzenius: Natural scientists.

George Dyson: They were his group.

Linda Arntzenius: Harry Woolf.[29] Did you come back for the Einstein Centennial in 1979?

George Dyson: No. At that time, I wasn't being invited. I wasn't even invited for my father's big – whenever he turned 70 or whatever - they had a big celebration for him that I would have loved to go to.

Linda Arntzenius: Yes. So you wouldn't really remember Goldberger[30] or Woolf much.

George Dyson: Well, I remember the Goldbergers really well because Mildred Goldberger started the children's museum here way, way back. It was in a building near the Nassau Club, near the Trinity Church there. She worked very hard to get kids involved in that.

Linda Arntzenius: It was a museum for children?

George Dyson: It was long before the Exploratorium but it was that sort of idea, a place kids could go and play with scientific stuff.

Linda Arntzenius: I wonder what happened to it. Griffiths?

George Dyson: I really didn't know [him] until he invited me here. The whole year I was here, I spoke very little with him.

Linda Arntzenius: So when you look back at your association over the years, what are the biggest changes that you've observed?

George Dyson: In the Institute?

Linda Arntzenius: Mm-hmm.

George Dyson: Well, it's hard to separate what I personally observed and what I now know. That year I was here, I really went through those archives in a way that I don't know any [-one else has] – learned an awful lot just the way you see the documents, you kind of know what things have happened.

Linda Arntzenius: You're talking not just about the ECP, you're talking about the founding of the Institute.

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[29] Harry Woolf (1923-2003), IAS Director, 1976-1987; Professor-At-Large, 1987-1994; Emeritus Professor, 1994-2003.

[30] Marvin L. Goldberger (1922-2014), Member in the School of Natural Sciences, 1966-1970, 1976-1977; IAS Director, 1987-1991.

George Dyson: Right. I was given access to everything, so I sort of read everything. 'Cause stuff would turn up in the strangest places. And I did become interested in the beginnings and why what happened, happened. I was just curious. So I feel I know the whole history – I mean, I actually know more about the history of the Institute than I should.

Linda Arntzenius: Will you write a definitive history of the Institute?

George Dyson: No, I don't –

Linda Arntzenius: No? Why not?

George Dyson: I don't want to spend the time on it. And it's so controversial. The history by Beatrice Stern is pretty good. It's pretty thorough. It's not a very readable history. Her story just is all these conflicts. To me, the real turning point in the Institute, which is the sort of thing I would probably say could be on the record because it's true, and I don't think it's going to hurt anyone's feelings specifically, but there was a transition made. We've had this series of directors.

First was Flexner,[31] who was really a schoolteacher and an administrator. No way remotely was he a scientist or an academic at all. And then there was Aydelotte, who also was just a really good school principal/administrator. In their own ways, I think they did a great job, particularly Aydelotte, who, I think, was almost the best director they had, and very much a diplomat. He helped go to Palestine in 1947 - just was always there solving problems. And Flexner just was in an impossible situation. Sort of like being the founder of any of these startups where you just can't stay. You have to leave.

But then they got Oppenheimer which was this completely anomalous case where you have a first-rate physicist – really a great academic, completely qualified to be on the permanent Faculty here, who then through just the chance of Los Alamos, happened to become an administrator and was really good at Los Alamos.

I mean, everyone at Los Alamos just, much as they might disagree with Oppenheimer, he did the job. And then that sort of set this precedent where the assumption is that the director here has to be fully qualified to be a permanent Faculty *and* a good administrator. I think those are incompatible things. Oppenheimers are rare.

And then you risk all these problems of, "Well, is the next director going to be from physics or math or whatever?" Why not look for a good –

Linda Arntzenius: - professional director or administrator.

George Dyson: You don't want some dull professional, but maybe look outside this academic world a little. Although, it's the same as university presidents

[31] Abraham Flexner (1866-1959), IAS Director, 1930-1939.

now. They're supposed to be – and I think that's a mistake. I think it would be – it's better to – I think it's – and, again, I'm not saying anything specific.

But they've [the Institute has] had great directors. They've all been wonderful. But it is a hard job to do. It might be the schoolteacher is really – would be great. 'Cause it's an amazing opportunity here to do something.

Linda Arntzenius: Do you think Flexner was right in thinking – if I'm getting this right – that the sort of speculative research that is intended to go on here, needs a special environment?

George Dyson: Well, nobody really knows what – what is the Institute supposed to do? There really are no rules. You can go back [and ask] what were the Bambergers thinking? What did they want? It diverged from that pretty quickly. I think one of the fundamental assumptions at the beginning was that the Schools would have a finite lifetime, that something would be done here for a while, and then it would shift to something else. Now the problem is the Schools have become so large and institutionalized, you can't stop –

Linda Arntzenius: Do you think it would be an improvement if the – for a time, of course, the Institute was consulted by the government, especially during and after the war. Do you think it would be good to have part of the Institute's mission to be a think tank of sorts for the government, I mean, a place for them to come and –

George Dyson: I don't know. It certainly was more. I mean, it's sort of sad now when you – particularly last time I was here, you look around and there's like nobody in the room who could call the president and have him answer the phone. It's probably different now. But under Bush, clearly the Institute was very isolated – whereas, in the old days, yes, it was very much part of the political presence. I don't know. The beauty of the Institute is that it's not restricted. It could do anything. It could completely start something different.

Linda Arntzenius: What do you think of Piet Hut?[32]

George Dyson: That's a tough question. I don't really know him. The year I was here, I talked to him a bit because one of the things I'm interested in is stellar evolution, and that's what he came here for, so it was very great to talk to him about that. But about the other stuff, I don't know. I mean, I don't know what his little school is doing.

Linda Arntzenius: If you had the Bamberger gift today, what would you do with it? What do you think – what's the need? I mean, Flexner had this vision and it was driven by the fact that the country needed to have higher research in education. And Veblen, too. We needed mathematicians.

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[32] Piet Hut (1952-), Member in the School of Natural Sciences, 1981-1984;), Professor in the School of Natural Sciences, 1985-2002; Professor in the Program in Interdisciplinary Studies, 2002- .

George Dyson: I don't think the Bambergers would be very happy with what happened in the end. But that's hard to say. Flexner had his vision. If you literally say if you gave me that endowment now, what would I do, I would do something totally different. I would give it to high school students.

Linda Arntzenius: For a specific purpose?

George Dyson: No. I think – well, I mean, if you're going to ask me really what I would do, it would be to create the equivalent of the Institute for Advanced Study, but it might need no physical existence at all, but essentially, if you had to describe it in one sentence, it would be sort of MacArthur Grants for High School Students.

So there's a way that kids like me who are creative and functional, but bored to death in high school would have an acceptable way to do something else, even for one year. You could give kids $10,000.00 for a year – and a very simple selection process, maybe it only takes a five-page application and three letters and then you either get this or you don't. But if you do, you are not dropping out, but you're not stuck in the rut of being an unhappy kid in high school. Because a lot of the kids who are unhappy in high school are unhappy because they're too smart. And there's no escape for them. So if I was Bamberger today, that's what I would do.

Linda Arntzenius: That's interesting.

George Dyson: Yes, I think the money would go a lot farther.

Linda Arntzenius: Do you regard your – was it a year or two years - in your tree house – do you regard that period as formative?

George Dyson: Yes, incredibly formative. But it was completely sort of – it wasn't illegal, but it was just very risky. There was no – I was burning my bridges - there was no coming back.

Linda Arntzenius: It was dropping out.

George Dyson: It was dropping out. But if you had a way where a kid who's – if some kid says, "I want to go live in a tree house for a year, but this is gonna be okay – and I do wanna go to college, I will help me that I had this fellowship."

Linda Arntzenius: Well, now you can go to NOLS, the National Outdoor Leadership School. My son did this. He went to Alaska and his little journal which is fascinating reading 'cause it wasn't always fun, it was very challenging. But you can get college credit for these things now. It's really fantastic.

George Dyson: But the beauty of the Institute is that you are allowed to do whatever you want to do. It's just the decision is made that you deserve a year off or you don't. I think the similar thing for high school kids would just be great,

where, “We trust you. You’ve got the year off.” And a lot of kids would just do great stuff. They would do volunteer work.

Linda Arntzenius: I think you’re right.

George Dyson: Anyway, that’s what I would do.

Linda Arntzenius: Well, let’s hope it happens one of these days.

George Dyson: I think the world – I mean, at the time, the Institute was unique. But now, of course, there are similar sort of opportunities.

Linda Arntzenius: Can I ask you a personal question?

George Dyson: Yes, you can ask.

Linda Arntzenius: How did you break your nose?

George Dyson: Oh, in a really stupid car accident. I wasn’t driving, but I was driving with – at age 17 - someone who was drinking.

Linda Arntzenius: How did your father break his nose?

George Dyson: He’s broken his nose several times.

Linda Arntzenius: Fallen?

George Dyson: Yes. Recently, he fell in Moscow. And then – well, then he was mugged in Washington, DC.

Linda Arntzenius: Oh, dear. That’s awful.

George Dyson: Yes.

Linda Arntzenius: No. I thought you were gonna tell me some story about being in a bar room and –

George Dyson: No, no.

Linda Arntzenius: *[Laughs]* All right. Is there a question that you thought I was going to ask you that I haven’t asked?

George Dyson: No, not really. Well, I don’t know if I’m putting my own opinions on this, but I mean, the Bambergers very definitely clearly wanted this Institute to do something for – specifically the people of Newark, which, of course, they’d given up on, but also the people of New Jersey. And it really isn’t clear what [the people of New Jersey get out of the Institute].

Linda Arntzenius: Prestige?

George Dyson: Yes, but Princeton has a lot of prestige, so I think that needs a little more work, and I'm sure people have worried about that.

Linda Arntzenius: Did you ever meet any of the Bamberger family?

George Dyson: No. And I think, also, I mean, this is true of so many foundations that they actually end up - what the founders wanted to do is not what really happens. So in the end, I think, the Institute's done very well. The question is where it goes from here.

Linda Arntzenius: Have you got any subjects or any thoughts as to where it should go from here?

George Dyson: Well, of course, I do, everyone – it's like when you look at the files of when it started, Flexner wrote to everybody and everybody said, "Do this," or, "Do that." Everybody had their own idea of what to do. And so it's true now, too. Just everyone will want to create a school of their own interests. But I don't know what the biologists are doing. I'm curious. But it's great because so many people wanted to do biology here all along and now we have a school of biology.

Linda Arntzenius: And that goes back to von Neumann, too, I understand.

George Dyson: Even before.

Linda Arntzenius: Even before. Barricelli?

George Dyson: Barricelli[33]. And Haldane was invited in 1936 to start a school of biology.

Linda Arntzenius: Really? He didn't come, though.

George Dyson: He didn't come. No. He went to fight in the Spanish Revolution instead. But what would the world be like if they had brought him? So I think – yes, I don't know, but – I mean, I can only imagine the problems of starting a new school. It almost can't be done. I mean, you can't sort of close down something that's functioning. So I think new schools would have to grow within –

Linda Arntzenius: Do you think Flexner was naïve in thinking that that sort of thing would happen, that to some extent, the people that were going to be working here would be so egoless as to say, "Well, we've had enough of this. We'll move onto something else"?

George Dyson: No. I think he was quite realistic. But it depended on everything remaining much smaller. At that time, there were so few people here, so his idea of a school was really a one-person, like Panofsky[34] would be the school of

[33] Nils Aall Barricelli (1912-1993), Member on the Electronic Computer Project, 1952-1956; Member in the School of Mathematics, 1953-1954; Visitor on the Electronic Computer Project, 1956.

[34] Erwin Panofsky (1892-1968), Professor in the School of Historical Studies, 1935-1962; Emeritus Professor, 1962-1968.

art history, and students would come to work with Panofsky and one day Panofsky would die and that would be the end of art history and something else would start.

So his model was much more finding these brilliant individuals. Oppenheimer might be the school of particle physics during this exciting time. But when Oppenheimer and the excitement in particle physics were over, that was it.

Linda Arntzenius: Do you like that idea, it has an attraction?

George Dyson: I think it's a good model. It can sound extremely elitist to take this view that there are these people who define certain fields. But the reality is that is how the world works that a certain, Picasso comes along. Lots of other people did art like Picasso, but nobody else was Picasso. That was a school of art. And I think creating a place that recognizes that, does have a certain value that otherwise, you end up with these large schools that in a way become more like a university where there's so much administration and so on.

Linda Arntzenius: Yes.

George Dyson: But I think the Institute has irrevocably gone beyond that. You're not going to get it back to –

Linda Arntzenius: You mentioned Panofsky. Is he someone – he died in –1970?

George Dyson: '60-something. So I don't know.

Linda Arntzenius: So you don't remember him much.

George Dyson: No. I remember his dogs.

Linda Arntzenius: Oh, yes. George Kennan.[35] How about him?

George Dyson: I knew who he was, but I didn't know him. He had an office across from my father. He is another example of one sort of stellar person.

Linda Arntzenius: Yes. And there was some controversy about bringing him in.

George Dyson: Huge. Yes, von Neumann was strongly against [it.]

Linda Arntzenius: Oh, really?

George Dyson: He was not a scholar, he was a politician. But he created – I mean, he's one of those people you couldn't really replace. So I think – and my father thinks, and I think, too, that the most important part of the Institute are the people who get to come here for a year.

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[35] George F. Kennan (1904-2005), Member in the School of Historical Studies, 1950-1955; Professor, 1956-1974; Emeritus Professor, 1974-2005.

Linda Arntzenius: The Members?

George Dyson: Young people, yes. That's sort of independent of who the permanent people are.

Linda Arntzenius: Yes. I think I've heard him say that it would be fine if there were no permanent Faculty.

George Dyson: Yes. Of course, then he wouldn't be here.

Linda Arntzenius: *[Laughs]* And then no one would want to come. *[Laughs]*

George Dyson: Yes. I don't know if they come for him. I mean, people – I don't – I mean, I haven't looked at – I don't know – there used to be these periodic reviews –

Linda Arntzenius: Decadal Reviews?

George Dyson: Yes. I haven't look at the latest [one].

Linda Arntzenius: So do you do a lot of speaking? You mentioned you're giving an after-dinner talk tomorrow night for the humanities and social sciences –

Do you do a lot of that? Are you in demand talking about the Institute?

George Dyson: No. No, not about the Institute. No. I do give a lot of talks, but they're mainly about other things, computing or the Project Orion or my canoe stuff on the west coast.

Linda Arntzenius: That's a beautiful book, Baidarka.

George Dyson: Yes. It's really variable. Some years, I've given like 30 talks and lately, I've been very reclusive and trying to finish this book.

Linda Arntzenius: So when is your von Neumann book expected to be out?

George Dyson: I think they're saying January 2012.

Linda Arntzenius: That's good. And does it have a title?

George Dyson: The title is *Turing's Cathedral*, to immediately counter the critics who will say von Neumann took the ideas from Turing.

Linda Arntzenius: Oh, okay. Well, Yes. All right. *Turing's Cathedral*. And [Alan] Turing, of course, you didn't – you never – he was way before your time?

George Dyson: But he was here[36]. He was important.

[36] Alan Turing (1912-1954) came to Princeton in 1937 to complete his doctoral thesis at Princeton University. His work is the subject of the chapter "On Computable Numbers," in Dyson's book *Darwin Among the Machines.*

Linda Arntzenius: He was here. Yes, I know. Very briefly. It's very interesting. It really is a remarkable the number of people who passed through these doors, either as Members or visitors or even just as casual visitors. It's incredible. And I think that imparts an enormous excitement to the place. Do you feel a sense of excitement when you return here?

George Dyson: Yes. It's mixed. I mean, it's always wonderful to be here. I think the problem is having grown up here, you do kind of want to get away. It's like going back to your Dad's shoe store or something. You sort of know too much. So I have very mixed feelings. But it's wonderful this place is here. And they've been absolutely wonderful to me, to welcome me back.

And I think the real value can be – it's sort of like these MacArthur awards which may not actually do that much. The people who actually get MacArthur grants probably waste them building houses and stuff. But the idea that such a thing exists, I think, gives hope to huge numbers of people who are trying to decide whether to keep working on their project or give up and go to law school or something.

It encourages them that if you really do what you believe in, there's a chance you might get a MacArthur grant. I think it's a lot the same with the Institute that independent of what actually happens here, the fact that there is a place in the world that is completely dedicated to pure scholarship with no strings attached, that in itself is a useful thing, just as an ideal, whether it lives up to the ideal or not.

Linda Arntzenius: It's very inspiring a sort of a romantic ideal that people are pursuing Truth and Beauty. They are pursuing it in their own way – it's a very seductive idea. Yes, indeed.

I'm almost done with my questions. I would like to ask you if you have any suggestions for other interview subjects for me.

But I will just leave it open to you if there's something you'd like to say or comment on or tell me a story about someone you remember, or whatever. *[Laughs]*

George Dyson: The stories are sort of – I think - pretty well known. The Woods are important. I think they really were important to a lot of the work getting done here by people, having that space.

Linda Arntzenius: And you attribute that to Veblen's influence I imagine?

George Dyson: Yes. He was – and which strongly angered Flexner and the founders were very against buying all that land. But he just couldn't resist it. It was there.

And I think that was [important for getting work done] – I don't know - now I suspect that's not true now, but at that Oppenheimer time in physics, really, it was those guys going off walking in the woods that led to so much work getting done.

I don't really know what it's like here now. I have feeling that e-mail and all that has changed people's work habits a lot.

Linda Arntzenius: Yes. There's only one, I believe, who works without a computer now. That's Giles Constable.[37] He doesn't have a computer. If you call him, he will answer his phone. He doesn't even have e-mail, obviously, but – he does quite well without it, thank you very much.

George Dyson: Yes. That's rare.

Linda Arntzenius: It's extraordinary. Yes. But it's probably true that it's come to the point that e-mail is gotten to be so prolific that he's better off without it. *[Laughs]*

George Dyson: Yes. And I think it makes it hard for people to get away from wherever they were getting away from.

Linda Arntzenius: Yes. So do you still take some time off and go wandering in the woods, or off to – what happened to your tree house?

George Dyson: It's long since disintegrated. No, but I live on the water in Bellingham and so I have a very pleasant life, but I'm not going off on any great adventures. I hope to after this book is finally done.

Linda Arntzenius: Do you have a topic for a next book?

George Dyson: No. No, I don't.

Linda Arntzenius: So it's wide open for you.

George Dyson: Yes. I don't – I really want to just do things again. I may – I'm interested in writing some stories, I mean, just of my own some sort of things I remember.

Linda Arntzenius: Good.

George Dyson: But, no, no big –

Linda Arntzenius: Any involving Princeton and the Institute?

George Dyson: No. I mean, that would be a chapter or something, but sort of memoir stuff, but not with a deadline.

Linda Arntzenius: There's a remarkable number of people at the Institute – Faculty at the Institute – who haven't written memoirs, which I find extraordinary. They are interesting people who have a lot of things to say and record and I think it's a loss.

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[37] Giles Constable (1929-), Professor in the School of Historical Studies, 1985-2003; Emeritus Professor, 2003- .

George Dyson: Yes. I don't understand that. Some people write too much and others *[laughs]* don't write enough.

You were asking about other people. Yes. I don't know of – I'm sure you've got all the lists. I mean, but – I mean, did you talk to Ulli Steltzer?

Linda Arntzenius: Actually, I spoke with her, but it wasn't about the Oral History Project. And I know that she's taken more photographs than we've seen. So I do believe there are more photographs out there to be captured. And, perhaps, the archives should reach out to her for that purpose, and soon. She might be getting quite elderly.

George Dyson: Oh, yes. She's very elderly. She documented the Civil Rights Movement very intensively, and I think that is all going to Princeton University. But her stuff from here, I don't know. But I know she did a lot.

Linda Arntzenius: Well, I'll mention that to Marcia.

George Dyson: And they're all two and quarter [inch] negatives.

Linda Arntzenius: Yes. That's great. But I was thinking of anyone – like you mentioned Bigelow.

George Dyson: Yes.

Linda Arntzenius: Willis Ware.[38] But you've interviewed Willis Ware, presumably.

George Dyson: Yes. He's still alive.

Linda Arntzenius: – Jack Rosenberg,[39] yes.

George Dyson: But not in detail about the Institute. They're both still alive. They're the last.

Linda Arntzenius: Yes. And Akrevoe Emmanouilides?[40]

George Dyson: Yes.

Linda Arntzenius: I'm interviewing her tomorrow morning.

George Dyson: Yes.

Linda Arntzenius: Any questions I should ask her?

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[38] Willis H. Ware (1920-2013), Electronic Computer Project staff, 1946-1951.

[39] Jack Rosenberg, Electronic Computer Project staff, 1947-1951.

[40] Akrevoe Emmanouilides (1920-2018), ECP staff, 1946-1949.

George Dyson: No. I'll be curious what she tells you. She doesn't remember that much about the technical details of the Electronic Computer Project. But she's very, very nice and the youngest, too, so young when she was here.

Linda Arntzenius: Yes. Well, I think that wraps it up for me.

George Dyson: Good. Okay.

[End of Audio]