

An Interview with  
HELEN ANN BAUER, FRAN CHESSLER, MARY R. FEAY, MARY HOLT,  
JOYCE MALLECK, ANITA B. MARSH

OH 515

Conducted by Thomas J. Misa

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Bell Labs Indian Hill (Naperville, IL) Women Group Interview

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Abstract

This interview — with Helen Bauer, Fran Chessler, Mary Feay, Mary Holt, Joyce Malleck, and Anita Marsh — took place during a two-hour luncheon. The interview does not have a biographical or career narrative, and is only loosely chronological. The interviewer posed periodic questions but the interview is mostly the stories, anecdotes, and observations of these six women. The topics include dress codes and AT&T corporate culture; early job experiences and attraction to programming and computing; women in leadership positions at Bell Labs; affirmative action committees and workshops; interactions with the wider 1970s women’s movement; personal experiences with child care; the impact of the Urban Minorities Workshop; observations about the levels of women in computing today; reflections on the transformation of the women’s movement, and responses to the election of Donald Trump as U.S. president (ten days prior to this interview); comparisons of computing with other professions; and general observations about recent modes of computing including mobile computing and social media.

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Feay: I wrote down some notes, I thought. I remember spending energy worrying about whether we could wear pants to work. And remember the day we decided that we would all wear pants, and we went home that night and worried if everybody else would do it or if we would be the only one there with pants?

Holt: And the jacket had to cover your butt.

Marsh: Actually, I wasn't a part of that.

Chessler: I wasn't either. But I went. . .

Holt: I was.

Chessler: I already mentioned [it] in my individual interview, and it's in Lois Herr's book. The women in the group nominated me to go ask our boss if we could wear pants.

Misa: Can I make one request? That is, especially for the first couple of times — our transcriber, Judy Clifford, is really good but she doesn't know your individual voices — so Fran, was the last voice. But just say whoever it is, and then over time, she'll be able to recognize your voice, but that would be a help to her.

Chessler: But I do not remember a unified “we are going to wear pants.” But my group sought me — and I’m Fran — to get the permission from Jack Scanlon that we could wear pants.

Holt: This is Mary Holt. It was a location-wide request all the way up the line, as I recall. Right, Mary Feay? It was a whole Indian Hill request at some point, and maybe individual groups, too. That’s the way I remember it.

Feay: This is Mary Feay. I remember it as a rebellion; it was just a few people saying we’re gonna do it, and certainly nothing that was sanctioned by anybody.

Unknown: I thought there was a rule.

Chessler: I don’t remember that.

Holt: That’s good. I’d forgotten that.

Bauer: This is Helen. My different memory was that they finally discovered the dress code was only for secretaries and so there was no restriction for technical. And then the secretaries rebelled at the unfairness that the women technical staff could wear pants.

Holt: That’s a great memory, Helen, I think you’re right.

Chessler: That's ringing some chimes for me. This is Fran, I'm remembering that a little bit, too; it's a fuzzy memory.

Holt: It was 50 — no, not 50 years ago — how long ago was it?

Unknown: It's pretty close to 50 years ago.

Unknown: 35, 40 years ago.

Malleck: Forty-seven.

Misa: I wanted to ask each of you a set of questions. One of the concerns that advocates for women in computing are trying to understand today is the question of mentoring. Each of you ended up going into computing very early. Prior to coming to Bell Labs, were there people that served in some way as a mentor, or inspiration, a model for doing technical work? Could be in your family, or do you remember any individuals that played an important role that said you should go into computing?

Malleck: This is Joyce. One of the helps that I remember is I was coming out of high school just post-Sputnik, which then kind of starting peaking in those areas; and I was always very good in math so that my entry wasn't through computer science but through math. And then I learned the computer science on the job.

Unknown: It was the time; it was the fact that it was the post-Sputnik era.

Marsh: This is Anita and my experience was exactly the same. Where I went to undergrad we didn't have a computer science program at all and I was a math major. Then I went to Northwestern on my own to get a math degree and my professor there said that there were only two places to work. One was Bell Labs and the other was Argonne [National Laboratory], there was nowhere else worth working in the Chicago area. So I decided rather naively that Argonne was too far to drive. So I went and interviewed at Western Electric, Bell Labs, and Nicor. I thought the Nicor job would be boring; Western Electric wouldn't talk to me because my grades were too high; so I went . . .

Misa: Too high.

Marsh: Too high.

[Laughs.]

Unknown: That sounds reasonable.

Unknown: Yes, you were supposed to be in Bell Labs.

Marsh: I was supposed to be at Bell Labs. So I interviewed at Bell Labs and it sounded interesting. I learned computer science on the job, and I had a very good mentor who

taught me my first assembly language and how to program. It was a man and he was in his sixties. He was very patient and he was very good. I learned a lot.

Misa: That was after you came to Bell Labs, though.

Marsh: After I came to Bell Labs. My first job was running assembly language for something, I don't remember what it was for, right now, but he taught me how to write in assembly language, and he made it so I understood exactly what was happening. So I understood the computer concepts. It was good.

Misa: Any mentors prior to coming to Bell Labs that any of you might . . .

Marsh: Just my math professor who said it's the only place to work.

Chessler: This is Fran Chessler. I told the story, too, in the individual interview. I don't know if you want us to repeat that here.

Misa: If you would, because your individual story might spark other peoples' memories, or give an occasion for reflection.

Chessler: Okay. So my story is that I was studying math and I started out in college thinking I was going to be a writer. Then I switching to math, then I switched to psychology. And I had a psychology professor who told me that for graduate school,

undergraduate psych majors are a dime a dozen. But if you really wanted to go into psychology, get your degree in math because the psych schools, the departments always want people that have the math skills to do the analyses for the experiments in psychology. He said do a math major; don't do a psych major. So I ended up double majoring, but in the process of doing my math major, I had some classes I didn't like, and the computer science department had not yet formed. They were beginning to teach computer science in the math department. So I took some computer science classes to get my math credits and I fell in love. And that's how I ended up in computer science. In terms of mentoring then figuring out what my career should be, my sister who is 10 years older than me said go with computer science, that's the hot new thing, you should stick with computer science.

Misa: Any other family members that any of you recall being supportive or encouraging? Computing as a career was new, so it's not everybody was aware of that.

Marsh: This is Anita again. My dad was an engineer and my mother was also very interested in math and science the whole time, so it was just common around our house. But they didn't really keep tabs on what I was doing or anything like that. I was going through trying to do whatever I want. I just liked the math better than I liked anything else. And when I got to college — by the time I got a job at Bell Labs, they didn't really know what I was doing for a living. They just knew I was doing something and getting paid for it. And my grandmother once asked me what it was that I was doing for a living and I tried to explain but it didn't really work too well. I got support at home because my

parents were very much interested in science just as a matter of course. Everybody, you know, did that. I was just interested, but not that they could guide me to computer science because there was no computer science.

Bauer: This is Helen. My mother ran her own accounting business out of the house from shortly after I was born. So I was just used to women working; it's what they did. And it was not computer science, but it was numbers and analytics. My father was an engineer, so they very much supported me. And again, I told this story when my high school algebra teacher first encouraged me to go into the five-year math program and then said he wouldn't recommend me because I was a girl. My parents went back to the school and said forget this. So surprise, surprise, there were 17 people in the five-year math program and only two girls.

Misa: That's an important point, of your mom and dad understanding, modeling, to start with, but also advocating when there was a question about your suitability with the school.

Holt: This is Mary Holt. I can't think of anybody that I would call a "mentor." I didn't have a plan; I just sort of happened into stuff. Something would happen and I'd say well that's seems good. And math was always very super easy for me and so I gravitated toward that. I have three sisters who are librarians; it's like I decided to do this other thing. But I really don't think I had any mentors. I will say, though, with the subject of mentoring that in the early 1970s — or was it mid-1970s, maybe — we started this

conversation. There was an awareness of how important mentors are for women and minorities in a non-traditional career path so we started this program. We always had programs we were starting and this one was to assign women and minorities mentors. And I think it was only after a lot of years of experience with this program that we started to question how much you can “assign” a mentor. This is just me speaking, but I believe it has to be a natural kind of fit. So anyway, that’s enough on that. But mentors became important and we tried to fix the fact that women didn’t typically find mentors in the workplace on their own.

Misa: You started mentoring within Bell . . .

Holt: We did.

Misa: . . . even though that being your personal experience, Mary.

Holt: I’m not saying I started the program, I was involved.

Misa: No, you were involved with it, but you had had a strong mentor, some strong advocate or something.

Holt: I never had a strong mentor; I just sort of went off and did things. If I liked it, I kept doing that; if I didn’t I did something else; non-planning person.

Chessler: With the exception of teachers, I never really had any [mentors]. This is Fran.

Unknown: My teachers.

Chessler: This is Fran. My family, [had] no corporate experience. We came from a culture where you didn't work for corporations. My mother had a high school education, [and] my father had a fifth grade education. I had no modeling in the home so any encouragement [or] counseling I got came from teachers or my friend's parents, to the extent that I had good enough friends that their parents would mentor me a little bit. But I had none at home.

Holt: You had the brains.

Chessler: I had recognition of the importance and value of education; bringing home good grades always got me strokes. But they had no understanding of what I was studying.

Feay: My situation was a little different than that. My father was a medical doctor and a researcher and had his company; but the expectation in the family was that my brother would get a medical degree because that's what boys did. And that he would go on and own the company, which in fact he does. But for the girls in the family, we could be anything we wanted, do anything we wanted, so whatever I wanted to do I could do. And

I enjoyed math; took math, there was nothing you could do with math except teach, which I did not want to do. But then I took a computer sc-

Misa: I've heard that before.

[Group laughter.]

Feay: But then I took a computer science class and that was fun! I mean it was like working a fun puzzle and getting a new one, and then another one, and a new language. So fortunately it turned out to be a job and a career.

Misa: I saw several heads enthusiastically shaking about the kind of puzzle-solving quality of computing.

Group: Yes. Yes. Very much so.

Misa: Does anybody have thoughts on that they'd like to share?

Marsh: That's exactly why I, in my computing, I understand because the puzzle is logical. This is Anita. I really enjoyed it, and it's also in a strange way, the reason why I didn't go into [management] — I'm the only one here who didn't, I stayed technical — because I enjoyed it more. And it's also the reason why I left Bell Labs, because they quit running out of puzzles and there was nothing new to do at Bell Labs. So I went to another company that had new technology and had a grand time there. I had done that; again,

that's why I worked at a startup, because there was new technology and it was something new to do. So for me, the puzzle is the most important thing. Yes, it helps that you have congenial people to work with, but —

Malleck: I've been retired for a long time and I still do puzzles.

[Laughter.]

Marsh: That's kind of strange because I don't like sudoku. I refuse to play it; it's just not interesting. But I still enjoy doing that kind of thing, other kind of stuff. And I love to cook, yes.

Malleck: This is Joyce. I think the puzzle-solving ability and enjoyment is addictive, you know? I think I'm older than probably everybody here and I live at a CRC. And I have about 30 clients who call me when they have — some are real easy, some are crazy — problems with their puzzles. And I'm still solving their computer puzzles for them.

Holt: What is CRC?

Malleck: Continuing care retirement community.

Marsh: Yes, I still do quite a bit of computer-related problem solving, yes.

Unknown: I don't. [Laughs.] I gave it up and my husband does it now.

Misa: Any other secret puzzle-solving? I wax and wane on sudoku; I do that for about three weeks, then I get maxed out.

Marsh: I just find it boring. I know how to do it but it's boring and I don't want to do it anymore.

Feay: I'd like to write a program to solve sudoku.

Misa: Yes.

Feay: I'd like to figure out like how people do it, and then write the program, which is like artificial intelligence. But nowadays, it's probably just an ordinary program.

Misa: I've a question: after you came to Bell Labs, do you remember the first time you looked around and saw a woman in a position of leadership? Do you have a memory of that?

Chessler: When Karen Boozer arrived.

Unknown: I didn't know Karen Boozer at all, so that wasn't on my radar.

Chessler: That's when we saw women in a leadership position.

Holt: I can't recall seeing any women in leadership when you get right down to it.

Misa: Karen Boozer's name [often] comes up, but could we just record her contribution or role?

Chessler: She was the first woman supervisor at the Indian Hill location of Bell Labs.

Unknown: That might explain it because I wasn't at Indian Hill at that time. I was at West, and I don't recall any women in a position of power.

Feay: She was promoted from another location and brought in.

Unknown: Right, she was brought in from another location, so I don't recall . . .

Bauer: She came in as a lateral.

Unknown: . . . the first one I knew was Hildegard Velanzer. I didn't work directly for her but it was Hildegard and she came from the military side.

Misa: Hildegard . . . ?

Unknown: Velanzer. I think I've got that right, don't I?

Yes.

Chessler: But she wasn't a manager.

Unknown: Didn't matter, she was the only one with authority that I knew about and I can't recall anybody else. Can you think of anybody? I knew you, Mary Feay, but you were in the same position I was in, and I only knew you because you were in the comp center.

Chessler: There were women who had been there for a while. So like there was Vi Smith, in Number One ESS [1ESS], who was a lovely woman but she wasn't really in a leadership position. But she kind of would take new women under her wing. She was in the technical world and everyone did — the project a lot of us worked on in the early 1970s was Number One ESS. Vi Smith had a set of videotapes where she taught a Number One ESS programming language. Everyone saw the Vi Smith tapes. So she was a leader in that way, I guess.

Unknown: She was a woman ahead of her time.

Unknown: But I wasn't on Number One ESS so I —

Chessler: She gained acceptance.

Feay: I remember her name, but I didn't know her.

Unknown: I didn't know her. I didn't see the tapes. I knew Hildegard more than anything, and I've forgotten how I met Hildegard but she was working on, what, One Away? I don't remember what it was and I really had almost nothing to do with that.

[Note from Bauer: I'm a little confused because this conversation was about Karen Boozer who did come from Whippany etc. It's being associated with Hildegard who I thought came from Holmdel with the rest of that crowd and had nothing to do with the military.]

Misa: You said she came from the military side? Was that from Holmdel or was she a military officer?

Unknown: No, she was not; she came from Whippany.

Chessler: Whippany was military.

Bauer: She was at Whippany. There was a big project called Kwajalein South Pacific, that Bell Labs had the contract for. About 1974 that got shut down, so all of the people out of the military [division] had to be placed. So they weren't military, they were just associated with a military project. As I remember, Boozer — this is Helen, by the way —

Karen Boozer was already a supervisor from that organization, and she was transferred in as a lateral because all of the positions were being filled by people from that division.

Feay: But she came to Indian Hill as a supervisor.

Bauer: As a supervisor, but I think she was a supervisor before.

Feay: Before, okay.

Bauer: That was the only distinction.

Feay: That was such an event; that was huge.

Chessler: I would clarify that Hildegard; she was very strong technically. She was not — my experience of her was she was not particularly supportive.

Unknown: Oh yeah.

Chessler: She found me; she had a reputation of being very demanding and authoritative. I wouldn't classify her as a leader or even as a role model because of the personality reputation she had. But she was a role model in that she had an important technical contribution that she made. I'm trying to say that in a way that's not too uncharitable.

Unknown: You got it. [Laughs.]

Misa: One thing we just touched on is people who played leadership roles without necessarily being supervisors; they can be leaders and respected technically, and have an important role, and do a lot of informal management without necessarily always having a supervisor slot. That's an important thing to understand.

Feay: There's always been in culture, in major changes like this, the very first pioneers who went before, and you know they were before our cohort group; and it's amazing that these people we're talking about did as well as they did. But not necessarily supportive of, you know, the shift that we were interested in. But they made a contribution.

Marsh: I found her a little different because I think I'm a little different from some of y'all in that I had a daughter and son when I was in my late 20s. I didn't know anybody else who worked in their 20s and still had children . . .

Bauer: You were a pioneer in that, absolutely.

Marsh: . . . and stayed working. Hildegard was supportive because I used to have to drag my daughter into Bell Labs at times because something would come up and babysitter was gone, and okay, she went to sleep in the patent office once. But Hildegard, for me, was helpful.

Unknown: Yes, but I think you worked directly for her.

Marsh: No, never even worked on the same project as her at all, just knew her through playing cards. There used to be a lot of clubs at the Labs, and so with the bridge club we used to play cards together so I knew her. She also had a son and she'd worked all through that, and I believe my having a daughter kind of gave us something in common.

Misa: Mary, you used the word cohort, and I've written that down. Cohort. But could you each reflect on *when* you saw yourself as a self-conscious group of women moving through the ranks or trying to negotiate the corporate world. Many women that I've talked to, I've asked them the question bluntly; did you have close colleagues that were other women? And for so many of them who worked 30 or 40 years, the answer was no. You formed a close-knit, self-conscious group. I know it happened organically, nobody was planning it, but could you say something about that because that's notable and distinctive of the group of women around this table.

Marsh: Jo Anne Miller and I both had small children who were two and . . .

Feay: I was going to mention her.

Marsh: . . . my son was a toddler at the time and my daughter was a three-year-old. And Jo Anne had about a four- and about a six-year-old. We were the only ones we knew who were working, except one other person who was not in our area. And we actually

happened to find ourselves in the same department after a while, starting out at, I don't know, 5ESS, as we were first starting out. I was not working in 5ESS yet, but I was in a supporting area and she was the only manager who truly understood my problems of like you want me to come in at 10:00 at night to go in a lab? Okay. It's going to involve some babysitting problems. She actually traded out babysitting for me at times when I couldn't find somebody, and so she did it. I dropped the kids off at her house, picked them up afterwards.

Feay: Jo Anne Miller.

Marsh: We traded child care. Well then we got this, you know, some of us thought a day care center at Bell Labs would be a really good idea. So we formed a group and we called it Working Parents because we didn't want to make it just for us so we made it men, too. And we wrote a proposal to why a day care onsite would pay for itself, and presented it to the upper management. Didn't go anywhere, but it was fun. Actually, I think it would've paid for itself, but anyway. And she and I, I think, were close for that reason. And then there were a couple other women that at this time we kind of stayed in touch with. So that was my experience with having another supportive woman, was Jo Anne.

Holt: This is Mary Holt. We probably don't need our names anymore, right? She's maybe got it. It happened organically, as far as the closeness of all the women goes. Not that any two of us would be necessarily close, personally, but a closeness developed over a period of I would say a decade or less. We all just — well, we started meeting over

lunch hours, right? I can't remember even what the meetings were called, but we met to discuss these topics and it just grew and grew of its own energy and its own successes over time. We'd make proposals and have them accepted or not, and these conversations continued. Workplace discrimination was just a conversation that was out there, and I still value so much all of this group of women and this much larger group, including many who are not with us today. I think you've spoken to many of them already on the phone, now they're all over the country.

Misa: Right.

Holt: I venture to say — this is how I feel personally, I'll just own it myself — I am always happy to see just about any of these women. I mean, there is a bond, there is a common experience we had that I think is not always typical in every job you have because of the timing and because of what was happening in the milieu. So for me, I feel very lucky to have been part of this group of women at this period of time. And also I think in a context, in a group working with all these men, who happened to be, okay, they're a product of all our culture. They were the product of a larger culture that we're trying to break through with new ideas. But they were smart people. They understood how to think abstractly. They understood how to think complexly — if that's a word — in complexity, and it was in its own way slow — it's like the long arc of history, but it's a slow — it was a slow opening and acceptance. I do think it's because of the type of people that were gathered there. They're thinkers, you know? Am I giving them too much credit? [Laughs.]

Malleck: I think it was also; my memory, I expect it really started in the mid-1970s, early- mid-1970s with the legal cases, you know, the AT&T legal cases, is when we started with affirmative action meetings, etcetera. So there was a set of people who used to discuss the issues of being women in a primarily male environment. So that was also I think somewhat a catalyst for forming those bonds among the women. They and the affirmative action leaders together . . .

Feay: On the committees.

Malleck: Yes, on the committees, working with each other to figure out okay, I'm going to have to be organizing this affirmative action meeting . . .

Feay: . . . And you had to testify. Ah, here we go, testifying again. [Laughs.]

Malleck: Yes, so then it's all that stuff that I think brought us closer also.

Unknown: Yes.

Unknown: Testifying was so important.

Bauer: The thing I really remember was the Women in the Work Environment Workshop that I attended in 1975 or 1976.

Chessler: I think you and I were in the same one.

Unknown: I don't know. To this day.

Bauer: Okay, so except for Karen [Boozer], there were no managers that were women at that time. And so they had to recruit from the supervisors and resource people that would run this. There were about a dozen of us who were resource people in this workshop and it really revolutionized me.

Holt: Yes, it did for many, many people, Helen, I believe. I think it was a breakthrough. And I don't know how unique it was in the industry, or I mean, in workplaces in general. But I believe it was very unique. I certainly have not heard about anything like that in any of the other jobs I've had so I think it was quite unique. We tried, anyhow.

Bauer: I think so too, but . . .

Holt: . . . we get credit for trying.

Bauer: And again, you know, we have to give some credit to some visionary people at the top who decided they'd fund it, you know? Somebody just had to put money up and fund these workshops.

Unknown: And some visionary people at our level who helped get it started.

Unknown: That's true.

Misa: Namely Mary Holt, make sure that we get that.

Holt: Oh my goodness. Well there were many, many people involved in making that happen. Many. Many. But it was really groundbreaking.

Misa: So the picture that I'm getting is that for some people it was more people problem solving; other people it was connected to essentially corporate policy. Think that there were commonalities and then you say there were times you were meeting, you're physically meeting trying to hash out responses. So that brought a group of women together in maybe a somewhat unusual experience.

Unknown: Yes.

Misa: IBM got a lot of credit for all kinds of progressive things; there's a bunch of activities that went on. If we continue the research maybe we'll find out that IBM also had kind of a cohort of women. But the cohort Bell Labs had, your presence is something.

Chessler: I'll add a couple things to that. One is Bell Labs had clubs that emphasized family and social; so like bridge club, that's how you met Hildegard. We had a Working Women's Forum club, so women had an organization to join, and meet each other, and talk about issues.

Unknown: Nice. Really structural.

Chessler: So that was still within Bell Labs environment. But also outside of the Bell Labs environment, feminism was a trend, a hot topic, and consciousness-raising. So there was some consciousness-raising groups and I think the women's forum, if I remember correctly, we actually organized some consciousness-raising groups.

Feay: We went to people's homes and [pause]

Several: Oh, yes. Yes.

Holt: That's part of it.

Chessler: That also built the cohort, I think.

Holt: It was part of it.

Misa: That was my question number four or five, the interactions with the larger women's movement was also a distinctive part of your career experiences. It would've been different in the 1960s and it would've been different in the 1990s, but the 1970s and 1980s it was a very strong force.

Holt: Definitely. The outside forces and culture at large were absolutely contributing to the timing of all of this.

Chessler: Absolutely.

Holt: Five years before, five years later, I don't know; it was just right timing. And then the [1973] consent decree, it was like the perfect storm in my view. And even Indian Hill versus other Bell Labs or AT&T locations and companies. I may or may not — I think I said something in the personal interview — I switched out of technical into other [areas], but I went from Bell Labs to Illinois Bell, and it was a culture shock. This I may want to edit out but I'll say it right now. It was an unbelievable culture shock to go from Bell Labs to Illinois Bell. The position of men and women, about what was acceptable in terms of interaction, behavior, language, physical — I had to keep shutting my mouth, which I didn't always do. But, you know, like oh my God! Because I'd gotten used to just with like eight years of this at Bell Labs, I'd gotten used to that certain things were really, really not okay. But there was like — now, over time I'm sure that gap closed — but it was a very large gap, very large.

Marsh: Western Electric was not as enlightened as Bell Labs but since the Western Electric program was absorbed into Bell Labs, it changed; at least for the managers that I knew that worked with us, it was quickly becoming different.

Malleck: There was the Western Electric contingent at Indian Hill . . .

Unknown: Yes.

Malleck: . . . which was really more like Indian Hill than Western Electric.

Marsh: Right, it came on into the Indian Hill culture because we had a lot of Western Electric people at West, also. Same story, they came into the Indian Hill culture, not the other way around. But it had been quite regimented before, and you would see some of that if you visited, say, Columbus, where the Western Electric presence was much stronger.

Malleck: Or any of the manufacturing facilities.

Marsh: Right, if you went to Columbus you just pretty much had to visit the manufacturing facility because it was all there.

Holt: That's where Sue Moore was, wasn't it?

Unknown: Yes.

Unknown: She was there for a while.

Unknown: Said it was a little different.

Unknown: So we were this microcosm, maybe. Who knows?

Marsh: I think Holmdel was more like Indian Hill. I don't know. My only experience with contact with Holmdel was in the — what would it be? I'm trying to think — I had a four-year-old at the time; no, I guess I had a five-year-old so this would've been in the early 1980s and I think it was trying hard to do the same sort of things we did. As a part of the working parent's club, we sponsored a day care. We got Bell Labs to donate money to a day care and we talked to the day care company and asked them if they would give those people that signed up a break on their day care expense, and they agreed to do it. And we did it because there were people who could not afford to send their children to summer camp in the summer because it was expensive. So it let some of the clerical people that worked at Indian Hill send their children to day camp. So it worked out pretty well but we did get some flak for it.

Feay: My memory of Holmdel and affirmative action is there was a big deal about we had group offices that had six or eight people, you couldn't have the door closed because if there was a man and a woman in the office it was just like a general policy you had to

keep the door open; who knows what would happen. And women had to be assigned different closets than men because wouldn't it be horrible if a man got home and there was a long hair on his coat from being in the closet.

Unknown: Never heard that one.

Chessler: That was at Holmdel, but it was also earlier.

Feay: Oh, it was way early, yes.

Chessler: So it's not clear whether it was location dependent or time dependent.

Feay: Probably time dependent.

Holt: Yes, because I don't recall any of that at Indian Hill.

Feay: That was astonishing to me.

Unknown: I would think so.

Feay: You have to keep your coat in there because what if — 'course I had long hair way back then. [Laughs.]

[Laughter.]

Unknown: But I don't remember; even like when I joined the comp center then and I interfaced with more New Jersey people, it didn't seem like the women's movement was as organized in their locations as ours.

Feay: Yes.

Unknown: I think that's true.

Unknown: I never saw it anywhere, even Murray Hill; there weren't that many.

Marsh: Murray Hill I think was more conservative, I think.

Misa: More conservative at Murray Hill?

Feay: Yes, that's the research lab.

Marsh: Much more male.

Unknown: Much more male.

Feay: Way, way.

Marsh: Yes, way. That would be an interesting location to look at.

Misa: I want to talk about the women's movement. You haven't been talking about the public figures so much, but really the techniques, the tools, the consciousness-raising, the kinds of things that women's groups were perfecting locally in their own lives. But were you paying attention to the wider national discussions?

Bauer[?]: Oh yes. I mean, Gloria Steinem fan all the way. I subscribed to *Ms Magazine* when it first came out, all that stuff; Bella Abzug, you know.

Holt: Oh yeah! What a time. It was fun.

Unknown: It was fun.

Bauer: In terms of building the community within our organization, it was things like consciousness-raising certainly.

Marsh: To a certain extent, yes.

Unknown: Didn't we actually bring Gloria Steinem to speak at Indian Hill?

Holt: Oh boy.

Marsh: If she did, I didn't know about it.

Unknown: I remember seeing her.

Holt: That was in your dreams.

Bauer: It could've been.

Misa: In your dreams. [Laughs.]

Unknown: But I seem to remember her on the stage, anyway.

Marsh: My problem was how do I work a reasonable number of hours and have children, and I'm married, too, you know; and I actually like my husband.

[Laughter.]

Unknown: This isn't being recorded, let's say.

Marsh: So for me, the balance was not so much that — yes, I was part of the consciousness-raising group, and I did do that — but it was trying to manage three things that can all be full time jobs and trying to keep that running. That was probably why Jo Anne Miller and I became much closer because we were both doing the same rat race.

Holt: I'll say one thing about Jo Anne Miller — sorry Jo Anne — this is maybe mythology and maybe my old brain, but I think she had a baby in a backpack when she went in for an interview.

Marsh: Oh she could have because her children were not very old.

Holt: I mean, she's just like, "this is me."

In unison: Talk about someone who is un-intimidatable.

Unknown: That's right.

Holt: Zero. Totally un-intimidatable.

[Laughs.]

Unknown: She was. I said you did what?!

Misa: And her name again was?

Marsh: Jo Anne Miller.

Bauer: Jo Anne Miller. I think you interviewed her, too.

Misa: Yes. I don't remember the baby in the backpack story.

Holt: It may be that I made it up, but it fits.

Bauer: You might've been dreaming like I did.

Holt: I might've dreamt that.

[Laughter.]

Marsh: My daughter at that time was not very old, so yes, and I did once bring her in and because the babysitter just wasn't there when I went to drop her off. So what do you do? I could only say not coming to work or I'm bringing the baby, so I brought the baby. And, you know, after awhile, she's gone to sleep, I put her in the patent office. The guys in my local group were always supportive, bless their little hearts. Shared offices with a guy, he was very good about sharing an office with a small child. So yes, I did until it got to be where that was against company policy. But then it was Jack Scanlon who said yes, sure, I'll sign you a pass [so] you can bring your child anytime. Okay fine, I'm tired of having to try to get it done, just let me do it anytime I want.

Bauer: I can't believe that Jo Anne brought her baby in a backpack to a meeting.

Holt: No, no, not to a meeting. To a job interview

[Chatter.]

Marsh: I can. I brought my three-year-old and my one-year-old to a meeting at the labs and he fell asleep in my lap because we were sitting there.

Holt: Better than screaming.

Marsh: Yes, so I brought him to a meeting at Bell Labs because I had a meeting and, you know, that's the way it was, that's the only way I could manage to get there.

Holt: You were a working mother pioneer, there's no doubt about it. And Jo Anne, and there's a few.

Marsh: I also found out that you couldn't work at home because your child would remove the telephone from the modem in the back. I swear to God. [Laughter.]

Ten minutes after you have the modem in the back, and you plug the telephone into it. You couldn't do it because your toddler would pull it out.

Misa: Little child technology traps.

Holt: 1968 was such a big year, you know, in our world. I graduated in 1968 but I was on campus at that time and I'm sure a lot of you guys were, give or take a few years.

What we were talking about earlier about consciousness-raising, sit-ins, I mean, there were sit-ins galore on campuses. You know, you'd sit-in at the administration building

because you don't like something they're doing in the neighborhood, and whatever, at the University of Chicago. It gave permission to all these sort of things we were doing. I mean we weren't the first to do consciousness-raising, go against authority; it was happening in the world. But then we did it ourselves, which was pretty cool I think. Sorry, that was it.

Feay: So one dimension going bang to me was when I went on an affirmative action workshop for blacks.

Unknown: It was a big bang.

Feay: Urban Minority Workshop, and that was a significant emotional thing for me.

Holt: It was for everybody who went. I don't think anyone escapes that without a significant emotional event.

Feay: Well, it made our problems seem — not insignificant — but certainly a different dimension.

Holt: Absolutely. It was powerful.

Misa: Any other specifics about the Urban Minority Workshops that you might like to share?

Marsh: Well, I can relate from it as an employee, I'm glad I'm not a black woman; that's got to be a rough life.

Feay: Double whammy.

Marsh: Yeah, just wow. And your problems are not just white, either. Some black men are not too happy with you either. But I also came away with was gee, you know they are amazingly tolerant of me. Well I could understand how you wouldn't like me at all so I'm really glad that you are willing to try and educate me. So yes, I got a very different perspective. And then some of the technical people I worked with were very, very sharp and so when I always heard the stories from family, because I was raised in the South, about shiftless, or lazy, or dumb. I could always say well that's not been my experience. And I tried to make sure my children saw black engineers because I thought that would be a better role model for them than just athletes, or something like that that they saw on TV.

Unknown: One of my favorite experiences at Bell Labs and all the jobs I had were the two or three years that I worked in a department where the department head was black. My supervisor was a black woman, many of the employees were black and they welcomed me with open arms into their group. We'd go to the cafeteria and I'd be sitting at the black table and I learned so much from the experience, because they didn't feel any inhibition talking to me because they had their own power bloc. And it was great.

Marsh: I learned a lot. I really learned.

Holt: Those workshops were absolutely phenomenal.

Marsh: I met some people but then I got more acquainted with them and I think I can recall the black woman that invited me to a meeting. And I was about meeting-ed out at the time, so I said well why do I want to go to your meeting? So you could hear this stunning stop; but she explained it, so I said okay fine, I'll be there. And after we met each other — you know I don't remember her name — we became much closer friends, but I began to see her point of view a little bit better, and it was very, you know, I learned a lot. Like I said I learned to appreciate that they were really very understanding to be trying to educate me. So that meant a lot. Had a rough life.

Holt: All these issues, we're still working them out.

Feay: Yes, we thought they'd be done by now. I did.

Holt: Every single one we're talking about they're still; it's still working itself out, which is like maybe some things take decades in a century, or whatever. I don't know.

Misa: My last question touches on this; maybe make sure we get back to that. In terms of advocating for women respecting all the women-friendly workforces, there's a question

of temporality because you work on a day-by-day basis, kind of like what you're saying, you went to lunch with these people and had a different experience.

Unknown: I was the token white woman.

Misa: Token white woman, right, so you had a different experience there. But then in the same point in time, you're talking about the affirmative action workshops or these things that take place on a once a year basis or something. Can you just talk a little bit about maybe the tension, or how that fit together, because you worked day-by-day [but] then with the workshops, with affirmative action, with the annual reviews, those are on a longer term calendar. I'm just wondering how those two might fit, were they tightly coupled, or were they going in different directions?

Marsh: I guess I didn't feel that my [annual] review had much of anything to do with what I said at an affirmative action workshop; maybe I was wrong and didn't know it but I never heard any feedback on anything I said.

Holt[?]: Is that what you're asking?

Misa: That's an important coupling because you could say am I supposed to say things that the bosses want to hear and only what the bosses want to hear, or can I be honest? And so that would be one instance about how those two events interacted.

Marsh: I don't think I ever thought that. And I did support another woman a couple of times — one was black and one was not — in that they were being discriminated against and so I did comment on that, and I don't think I got any backlash over it.

Feay: I did that once. I just recall I'd supported a black woman and I got slapped around somehow. And, I mean, obviously I didn't let it change my mind. I was on vacation and so the fact that I'd supported this woman was debated while I was gone, and I came back to a little firestorm.

Marsh: [Ironically] How wonderful. So I don't know. I might've just not known about it, that's a possibility. I might've been oblivious but I didn't know about it going on back then.

Unknown: Could you ask your question again because I'm kind of sort of off track so far as I don't understand.

Misa: Change occurs day-by-day; change also occurs on a much longer time frame and of course, you'd say it's both, but I'm interested in some way about how you thought, or how you might now reflect about your day-to-day working experiences versus these longer term annual reviews, annual workshops, things that were not occurring day-by-day, or week-by-week, or even month-by-month. I know that affirmative action, I think that was on a yearly basis, is that correct?

Marsh: Twice a year.

Misa: Twice a year, but on a longer timeline.

Chessler: Okay, that sparked one thought in my mind on the downside, which is you could see coworkers who went to a workshop and came back, and were super sensitive, and observant for a week or two, and then revert to the usual habits. So in terms of when you're saying the longer term thing, the workshops, yes, they were less frequent. They weren't as frequent as every year. An individual would go to maybe two or three of them, in their career. But they frequently did not have a lasting impact, so it did not change the day-to-day. That's just my observation.

Feay: But we had to do it more often. But it was off the top we had to give. That's when we weren't working, we were doing affirmative action.

Chessler: And that was more than once a year.

Feay: Yes.

Holt: Multiple times, yes.

Feay: Yes, I didn't think about it at the time probably, but I looked at it coming here and thinking you know, that probably hurt our career in that one direction. We got credit for doing affirmative action, I'm sure we did.

Holt: Who knows?

Feay: Who knows.

Chessler: Don't know.

Holt: I'm still not exactly sure but I'll try and answer something relevant. I believe the workshops affected a very deep fundamental change in most people who attended. It's like this changed me; I was not the same person coming out as I was going in. Absolutely true for Urban Minorities Workshop, it was life changing. And then for the women's workshops, also, it may a little bit different way because I was on the giving end rather than the receiving end. But still, life changing in that it made us feel more efficacious, more — you know, not powerful — but like we can affect change and all that sort of thing. So I believe that when you go back into your day-to-day work on the tail end of these workshops, then I think that affected our interactions with each other a lot. I don't think it was the same going back in; I think it took both the day-to-day — actually I'm not quite sure what you're getting at — but they both contributed. I didn't experience what like what Fran just said, that people would slip back into their old habits.

Chessler: I'm really talking about the majority of members [i.e. white males] that went to a workshop. An observation I would have of them, they would come back being very sensitized to the issues. And that sensitization for many of them — not all of them — but for many of them seemed to fade.

Holt: I don't know. I never thought about this until now so I may not agree tomorrow with what I'm saying now — but I don't think it faded much from the Urban Minorities Workshop experience. I don't think you can fade from that very easily. I think it may have faded more with the women's workshops because you go home and . . .

Feay: There's a woman.

Holt: . . . there's your wife, your daughters, your sister, your mother, and there's just a different thing that pulls you back. I may retract that tomorrow but anyway that's fine.

Chessler: I recall the results; I never went to the Urban Minorities Workshop so I'm just talking from observation. But there was also a I wouldn't call it a backlash, that's not accurate, but a rejection because what I heard it was a more confrontive workshop.

Holt: Very.

Misa: The Urban Minorities Workshop was more confrontive.

Chessler: Yes, it was very confrontive from what I heard.

Misa: Some people said very powerful, almost disturbing in its power.

Holt: All of the above.

Chessler: You would hear the men who went to it, who would come back and say no matter what I said, I was going to be wrong. It was just designed to make me feel bad, and so they were rejecting it. I don't know that that affected their behavior with minorities, but for at least some of them, it affected how much they learned or gained from it; they were too defensive.

Misa: Too defensive.

Holt: Yes, scared.

Feay: So my comment was oh my God, they're going through this every day! What we live through every little once in a while as women getting smacked about the head and whatever, it's happening to blacks *every single day*.

Holt: And that is why it was designed the way it was...to make you feel like what it would feel like to be black.

Chessler: To feel the pain.

Feay: I still feel it!

Holt: I do too, Mary. I don't think you can *not* be changed by that.

Marsh: I didn't go so I don't know.

Feay: So you don't feel it.

Marsh: But I did see; you know, I did get some closer friendships with people who were black and would talk to me. Some of our affirmative action meetings were better than others and so sometimes they would open up and you could learn from that, learn about their problems and maybe I could be part of a solution.

Feay: Years later, decades later.

Holt: Oh yes.

Chessler: The popular view, the definition of affirmation action now is really a numbers game. When we say affirmative action we mean much more than that. We mean learning about each other, learning about diversity, talking about it.

Holt: Understanding your own racism, sexism.

Chessler: Yes. Affirmative action to the outside world means . . .

Feay: Numbers.

Chessler: . . . we have to have this many African Americans, this many women, and we've only got this many. It was more than that to us.

Misa: People would call that the checkbox version of diversity. It requires a real cultural change, not just checkboxes; like 13 percent, or 26 percent, or whatever it needs to be.

Chessler: Or you'd have Supreme Court cases about whether I was discriminated against because of that checkbox.

Misa: Joyce, did you have a comment that you wanted to add?

Malleck: Not really.

Misa: Well I have a set of lessons learned questions. The first one is so, what did you get right?

Holt: Right? Right. What did you get right?

Misa: Your experience changed one of the big American companies. Maybe not 100 percent, as the phrase goes, made a dent in the universe, that's pretty big. What did you do right? What are the key things that drove you?

Malleck: I think doing our jobs and doing them well went a long way towards making a lot of this happen because you can't argue with success.

Marsh: Well you can't argue when something works, it works. And when it works on time, and [pause]

Malleck: You know, and as each of us became an expert in some particular area of our fields, people would come to you and it didn't matter that you were a woman.

Feay: This is one of those things you have to be, whatever, better. So we were probably better than the men who got jobs like we had. No wonder we made a difference.

[Laughs.]

Holt: That's a good point.

Marsh: What did I get right? Well, my daughter is doing fine now so I must've gotten some things right.

[Laughter.]

Chessler: I think one of the things we did right is sharing our experiences and not being afraid to do things.

Feay: And working with each other.

[Yes. Yes.]

Marsh: I think to a certain extent that happened more in your area than it did in mine. West was a little isolating and yet we had very good managers for the most part, very understanding. But we had a couple of not so good examples that happened, and it was a little isolated. Fortunately, there were women that I did stay in close contact with.

Feay: I thought West was better because it was more computer science-y.

Marsh: It was better as far as [Jack] Scanlon was there and he was really very open to most anything. As he said, the only requirement for a dress code was that you wear shoes. And occasionally you had to wear those static protectors, you know, but outside of that he didn't care.

Chessler: I was delighted when he was back with me in 1970.

Unknown: I missed that.

Marsh: Yes, so wear shoes.

Chessler: Wear shoes. When I went to ask him could we wear pants and he said the only thing in the GEI [General Executive Instructions] is you got to wear shoes. As far as I care, you could come buck naked as long as you've got shoes on.

[Laughter.]

Marsh: So that was a very different atmosphere. But on the other hand, the guy that worked for him really didn't understand, like why are you working? Why are you doing this? You've got a small child, why are you working? Well, so I gave him an answer of a) I didn't want to waste my education; b) I enjoy it; and c) it made a difference in my children's life. They could do better.

Chessler: I could relate one story to the doing better. There was one guy that we worked with back in the comp center who was very right wing, John Birch Society type. It was well known, and he was not very helpful with mentoring or anything like that. But he found out I could write and he started bringing his memos to me to edit for him.

[Laughs.]

Holt: Was he a peer?

Chessler: He was a peer, but he liked the fact that I could edit his memos and then he would get good comments on them.

Holt: Then he had you bring coffee, too?

Chessler: No, but I edited his memos and then he would help me with some things I needed back.

Misa: So you had a transaction then.

Chessler: Yes, and so I think he learned a little more; for a lot of women in the comp center he earned respect from many of them. That's the way in which I [respected him].

Holt: Someone just said something about supporting each other; the women. Honestly, I don't remember any instances of women not supporting each other. As far as like this group that got tight.

Marsh: I can remember two.

Holt: But I can remember even now, women who did not do this; who got up high in power and were —

Feay: The women who were candidates for president?

Holt: Candidates for the Republican nomination for the presidency.

Marsh: That's right, that's one of the ones I can think of right there. [Laughs.]

Holt: I mean it, this group of women are like, you know, there is no excuse for that. If you are not supporting women up to the top of the organization and you get there, you are like *persona non grata*. So there really was a collegiality and a great feeling; that's what we got right. We didn't allow anyone to divide and conquer us as a group and we really had each other's backs.

Malleck: Yes.

Unknown: In 1998, that's my experience.

Chessler: I think there may have been some instances where that wasn't true, but overall it is true. And the Republican candidate for president is a noteworthy exception.

[Laughs.]

Unknown: Take that out. We didn't say her name.

Chessler: No, we didn't say her name. And when she was running, there were lots of people at other companies she worked for who were complaining about her.

Marsh: Exactly.

Holt: Yes.

Misa: We started this conversation by saying the situation today [in computing] is much less women-centered. Teaching [my] history of computing class, it's 10 percent women. That's about what the computer science program is at the University of Minnesota, it's about 10 percent women. It peaked [nationally] in 1984 at almost 40 percent and has fallen dramatically, so it's 20-25 percent, something like that. So it's dropped from the time that you were coming into the field. So there are a lot of very, very smart people that have pointed to mentoring, and changing the character of programming, and getting rid of stupid sexism, and on and on and on. Are there any observations or things that you could add to that conversation?

Marsh: I think that to some extent, some of the really smart ones, if you want to just make money, that you're probably better off going into one of the medical professions.

Chessler: Or financial.

Marsh: Or financial. You will do better. I don't think that computer science is known for paying as well at this point as some other things. And you certainly don't have much in the media or anywhere else about how great it is to work with computers. It's almost always men or it's very nerdy and even they aren't even well respected at all.

Chessler: That's getting at what I was; because I was struggling with this question. Mary and I talked about it last night and [we're struggling with it] today. I wondered how much of it — I don't have any knowledge, more of a question from my viewpoint — how much of it is the image that you tend to see of the computer person being the geeky guy, the nerdy geeky guy, which is not something that many teenage or young adult girls would aspire to be or wish to be. So I'm wondering —

Feay: Not even the guys want to be that either so it's not; you know, it's kind of a double thing; not sure anybody wants to do that.

Chessler: I understand but I'm just wondering if it's more of a turnoff to women. It's a question.

Bauer: I had an interesting conversation earlier this year after our conversation. I happened to be at a meeting with a bunch of very bright current college students. And it was after all their presentations and we were sitting around just chatting. So I had a table of about eight sophomore and juniors in a very adept program, male and female, mostly white, some minority, so I asked them the question of, I said, I had recently found that there was this trend. Did they have anything to say? What was interesting to me was I could not have been umpteen years ago having that conversation with a mixed company that the males would be at all interested in the conversation, back when I was in college. The males were very interested in the question and it was actually one of the males that said he had read — this wasn't his theory either — but he had read that there is an issue

because the video game has become more popular with males than females. And in the dynamics of the family, if there's limited resources, it was . . .

Chessler: I remember reading some articles about that.

Bauer: . . . the boys are getting more time interacting with the machine, and the girls are not. When we got into the field, nobody had experience.

Chessler: And also, the technology has changed so it was the big mainframe-type machines. You didn't go in there and operate it, you just learned to do the puzzle part.

Bauer: So that he had read some articles that when the girls do go into it [i.e. computing], they discover that they just haven't had as much experience interacting with the machines, and so they're a step behind and so used to some path of least resistance, try something else. So we had a very fascinating conversation about this.

Misa: Part of which is notable that you even had the conversation regardless of the exact diagnosis of it, that it was a topic that [interested] both the female students and male students.

Holt: I want to just make a comment on that given limited resources part of what you said, because there is a part of me that is still not clear. I don't really know how much is nature versus nurture; I really don't know because when I was in my early 20s and 30s,

boy, I thought you could get any child to play with any toy if you gave them equal whatever. My experience many, many years later with many, many babies is that there is a natural proclivity. So this is probably a sort of like anathema to this whole conversation, but maybe there's multiple reasons. Maybe girl children don't gravitate to those games, just like they're not as interested as some other games. I shouldn't be saying this out loud; we can edit it. But you know, it is to me, it's not settled, in terms of the large; I'm not talking about three sigma point examples. I'm talking about in the big part of the normal curve I think there may be something they're gravitating to.

Chessler: You can even kind of put that together, saying if the natural proclivity of girls is not towards the machines, and the technology today is more towards the small machines networked together, the natural proclivities don't fit as well.

Holt: That's what I'm saying; I'm saying there's probably a lot of pieces that go into this puzzle.

Chessler: And it's also the economics that the girls don't get the machines.

Marsh: Yeah, maybe.

Holt: I don't know, I think most of it has [inaudible]

Misa: You have to be careful because it's not a biological invariant because it changed, and it changed in your lifetime from the mid-1980s 'til now. But it is the case that computing in the period from 1975 to 1985 was a different activity. I mean, 1975 was when the first personal computer was being cooked up in Albuquerque; 1976 is the founding of Apple Computer. So we think this goes back a long ways but no, it's relatively recently. So there may be something to this that not because of girls inherently having one preference or another, but when computing changed from being large mainframe computers where if you were in computer science class you got just as more or less attached, connection to batch programming, or timesharing as anybody else. But at home — people have observed this — personal computers tend to be monopolized by the brothers in the family and the sisters got short shrift.

Marsh: Not in my family.

[Laughter.]

Misa: So there's a theory that's at least worth kicking around. Rather than saying it's invariant, maybe you'd say, well, are there ways of fostering computing activities that would appeal to girls' sensibilities. I would tell you, boy, they've gone down that path because girls supposedly want to make a difference in the world. They don't want to solve logic problems, they want to have something that goes out and fixes some problem for somebody. So in teaching computer science, rather than focusing on abstract hard problems, focusing on things that have an impact in the world, I'm using those impacting the world in quotes. That's something that people have been trying.

Chessler: My only observation is anecdotal because I know in my brother's family, he got a computer; he had a daughter and he had a son. And he would tell me, the son right on the computer; play with it, draw pictures, etcetera. Daughter, not at all interested.

Marsh: I didn't find that, but I did find with Mary's thing, you know; the boys and the girls do play with them differently if you give them the same toys, I did find that. I don't much like the shoot-em-up games, I'm just not interested in it. I think that girls — yes, everybody, you're shaking your heads agreeing — I think the girls go to different things.

Chessler: Different games, different applications.

Marsh: Different games, yes; different applications. And then there's some overlap. But I don't know if Pinterest is mostly women but I suspect that Pinterest is mostly women.

Holt: It's mostly women. Absolutely. I'd be shocked if it wasn't.

Marsh: Yes, I would too. So I think the applications are different but in my family, I'm much more computer literate than my husband and he's computer literate because he married *me*. So he had no choice.

Misa: Because he married you. Good for you.

Marsh: But my daughter, she was more computer literate than her husband by far because, well, she was my daughter. And she was more computer literate than her brother but I think that's just the way it worked out. Of her two children, her daughter is also computer literate but she's not interested in shoot-em-up games; her brother really, really likes that; really enjoys it. Her daughter is more interested in Facetime and stuff like that where you talk to people, or games that don't involve violence, you know, more like Tetris or Angry Birds or some like that. Just different games, different things, and I think just have different uses for what you do with the computer. So I think the computer needs to have a use, as far as women are concerned.

Chessler: It's not an enjoyment in itself, it's the use that you make of it.

Holt: Yes, I think so. I mean Pinterest, you can waste hours and hours on Pinterest. Or Facebook, or Twitter, or Instagram.

Chessler: I just got my Pinterest started last year and I don't pay any attention to it.

Marsh: You obviously haven't got it because you can waste hours and hours on Pinterest and you know, I don't see that's any different really than the games that the guys play with the shoot-em-up stuff.

Holt: Oh goodness, let's take that offline.

[Laughter.]

Holt: Oh well that's a funny comment.

Misa: I was remiss in saying the date that our conversation is occurring, 18 of November 2016. It occurs at a certain moment in history and I want to ask an open-ended question. Do you see the women's movement or the feminist movement differently today, after the election, that is, than say a year ago?

[Laughter.]

Misa: So same moment in time but do you see it differently?

Holt: Do we see the women's movement different before and after the election?

Misa: Yes. It could be about Clinton. On the one side, Democrats nominated a woman to be president. On the other hand, the campaign was particularly brutal and had language that I would not want my mother to see.

[Laughter.]

Chessler: I guess I'll say I'm *extremely* disappointed that I thought we'd gotten further than we apparently did; that misogyny can be overlooked the way it has been.

Holt: And blatant.

Marsh: Not only misogyny but also just racist; just horribly bigoted, just awful.

Chessler: Yes, all of that too, but I was referring to the women's movement part of it.

Marsh: You're right. It's pretty scary. Fortunately, hopefully he's not all-powerful. I don't think he is. I mean, there are laws in this country. I think that Clinton ran as good a campaign perhaps as she could have, but I mean I have to admit she made me a little uneasy. You know? When she was first nominated my husband said her biggest problem is going to be her husband, and I think to a certain extent that was true. I think that a lot of her husband's issues came and got dumped on her, and in that sense it was her problem too when it shouldn't have been.

Chessler: I agree it was her problem. In a way it shouldn't have been, but I don't think that was the biggest problem.

Marsh: Oh, okay. So I don't know. I don't understand anybody who did vote for Trump so I hope I'm not offending anybody here, but I certainly didn't. But I don't really understand why you would. But I gather there's an awful lot of anger that's still there and it's amazing that it is still there.

Malleck: I think part of the issue is the fact that many of the younger women didn't live through the things that we lived through and then didn't come to the election for that, with as much fervor or desire.

Marsh: Perhaps didn't vote, you mean?

Malleck: Didn't vote or wanted change more. What they perceived as change.

Holt: Or didn't see that as an important issue.

[Marsh]: Exactly.

Holt: We need two more hours. It's like where to go with this; this is really big; it's big right now.

Marsh: It was really awful.

Malleck: It was so awful that I haven't been talking about it.

Feay: We were on a trip so we were [in] Oman, whatever. And there was one woman who didn't come out of her room for 24 hours she was so upset.

Holt: That would've been me.

Chessler: Yes, and the women issue; the misogyny issue was disappointing to me. There were things that were even more upsetting to me about the election but I don't think we're here to discuss politics.

Misa: No, politics come and go but you participated in a certain turning moment in the women's movement; saw that in a positive way, an energizing way, a supportive way, you used tactics [pause]

Malleck: And the current young women just take it for granted a lot of things they can do.

Misa: So does that mean that the feminist movement needs to do some sort of a — I don't want to say a reset because you can't go back to the past. So is it the case that younger women or younger women and younger men basically need to be aware of the history that you've experienced; that it wasn't taken for granted that you would have this?

Holt: Do we have any idea what percentage of those people voted, the younger generation?

Chessler: I don't know the percentage that voted, but I do know of the ones who voted it was like 60 percent Hillary, 40 percent Trump.

Marsh: That's true, but if you didn't vote that's, it's in a way a vote for Trump.

Bauer: The statistic I was quoted — so I don't have this — was the same groups that supported Obama supported Clinton, but in much fewer numbers.

Marsh: So it may be a matter of them not voting, or not thinking that it mattered. And if that is the case, they may have a surprise coming in the next few years.

Chessler: There's a complex web of reasons that it happened. But the thing that bothers me most — it gets back to what you were saying about it's racist and so on and so forth — at the mile high level, whatever, is the extent to which I'm concerned for our country that the election results reflect a rejection of the progress we've made in diversity, and human rights, etcetera, equal rights for all people. It's backlash against that. I remember back in the 1970s when we were going to the affirmative action meetings, and the predictions were that white men were going to be in the minority sometime in the year 2000-something. And I remember back then thinking wow, that's going to be different. I'm concerned at the extent to which we're seeing that anger coming from that changing positions and what that means for the future of our country. Not just programming, but for the country in total. So I can't really answer a question about what do *women* need to do, I think the issue is bigger than that. And I don't know what we do about that issue.

Marsh: I think though that like you said, 60 percent of the younger voters, or the younger people appear to support more progressive ideas.

Chessler: It may just be time.

Marsh: May be time, but it may also be [advancing] that you really do need to vote. Everybody here voted, I assume. I mean, yes, we all voted. And I don't think you can say that of the 20-year-olds. So this may be a wakeup call. You can't assume your vote doesn't matter, it does. Hopefully. Maybe they will become more aware, more active, more involved.

Holt: Fran, you used the word misogyny, which is what's being used out there right now. And it's interesting that that word is different from sexism, and it has a different con-; what is the word I'm trying to think?

Marsh: Connotation.

Holt: Connotation, thank you. It has a different connotation and I don't really know what the right definition is but I think it has more of a wanting to have, not just thinking less than, but a harmful impact. Some of you know the right definition. But it is really what we just experienced is misogyny; it's not sexism, just sexism. I've been a fan of Hillary for decades. I really like all of what she stands for. I am really upset about the election, but I'm not as upset that because she's a woman I didn't think; I didn't think because she's a woman she didn't deserve to be voted in. Everybody, lots of people agree on lots of sides that she's the most qualified, so that's another thing. But what's upsetting is this misogyny and the other -ogynies that go along with it; the other -isms. I think I agree

with what Fran said, she said it more eloquently. To me, it's a real step backwards. Maybe it's just that a big chunk of the country had never stepped up and that's what we're discovering is where we really are . . .

Marsh: I hope so.

Holt: . . . as a country in terms of awareness and acceptance, and inclusivity, and all of that stuff. We're not alone. Lots of countries, it's happening in lots of parts of the world.

Chessler: Misogyny, by the way, is the hatred of, contempt for, or prejudice against women or girls.

Holt: Hatred and contempt are pretty strong words.

Chessler: And prejudice.

Misa: Pretty strong words.

Marsh: And it's amazing that his manager was a woman. I keep thinking how could you do that?

Holt: His what was a woman?

Marsh: His campaign manager was a woman. How can you do that?

Holt: Later on. But this is how can you overlook? We wouldn't have kept our jobs in the 1970s after the workshops if we had talked like that.

Marsh: Right. How can you overlook that?

Holt: It's so out of the realm of what's acceptable. It's like what?! Shocking.

Marsh: But people voted for him anyways.

Holt: But not shocking to most of the country.

Marsh: Yes, so that's kind of bad. And it's not just the; well, I don't know. My sister voted for him.

Chessler: I'm sure my brother did.

Marsh: I'm just totally shocked, like how could you do that?

Holt: And it's broken up more marriages, close friendships, family ties; Thanksgiving table's going to be interesting this year.

[Laughter.]

Holt: We can't talk about it. I can't talk about it. I couldn't get out of bed.

Chessler: And there are all the other things behind it, besides this issue of the kickback and rejection of diversity and progress that we've made. There's the issue of the lack of education or willingness to look for the truth. The issue of the technology that makes it so easy for fake news stories to propagate.

Holt: It's a terrible thing. I just heard about this; the false truth era. Have you heard about that? That's interesting.

Chessler: And the degree to which our culture; I mean, the way the internet has allowed this hate language, and smearing, and comments on discussions, and the smearing of Hillary and people saying okay, and believing it without challenging it. And the fake news, believing it without challenging it. The guy who I read about yesterday, the one who said he put out fake news stories because that's how he made money. And he doesn't support Trump, and he regrets what he did.

Holt: He makes \$120 grand a year.

Chessler: Because the Trump supporters were the ones who would click on his fake news story and get him money.

Holt: Yes, how many clicks, that's how much you make.

Chessler: Yes but the Hillary supporters wouldn't do that clicking, they wouldn't believe it, they'd ignore it.

Marsh: Right. Now you see awfully ugly things going out about the 'others' from the Trump supporters; very, very ugly.

Chessler: I hope there are not Trump supporters at this table.

Holt: Did you hesitate at all to put something out that was politically leaning one way? A bad question, because I don't think it was [pause]

Misa: I hesitated but I thought it would be inappropriate not to raise the question of the form that I did, because it seems to me that it is not just an election but some sort of a turning moment and I'm as puzzled as anybody else around the table, I'm sure. I didn't want to be artificial and say well there's no election that occurred and nothing that we would look back on and say that what followed 2012, there's nothing particularly [notable]. And I hope by doing that, I didn't put anybody on the spot. But it's just like you've lived through a generation.

Chessler: There's so many aspects to it. Yes.

Misa: You've lived through a generation, and it was a very powerful generation, and you put it in quite eloquent terms; it seems like it's somewhat under stress.

Holt: I think there is a lot [under stress].

Chessler: I think part of it, too, — I was going to add to it — it's more complex than just that issue; it's also globalization and what it's done to our economy. That coming out of World War II, we were the leaders and we had a really good economic stock because everyone else was recovering from the war. Time passes. The emerging nations are emerging; they're becoming more capable; and the privileged spot that we had in our country for so many years, regardless of the issues of sex and race and all that; but just economically, the privileged spot we had for so many years, it's not so privileged any more. And I think there's some of that anger, and some of that reality too. It's purely economic.

Holt: It's loss of power.

Marsh: I think it's loss of power; I think you're right. I think it used to be you come out of high school and get a very good job, support a family on a high school education. And you can't do that anymore, it's not possible. And people who got laid off 15 years ago, with a high school diploma or less, if they don't want to retrain they've got a serious problem.

Chessler: And it's technology, too. It's made the world such that you don't have the manual labor or the factory jobs in the numbers they used to.

Marsh: And you don't want to do it anyway, you know? So it's like it's not a job that most people want anyhow but they're still angry about the fact that the times are changing and I guess with the fear, it makes you a little angrier. It's always 'their' fault; where 'their' is somebody else but it's not you.

Holt: It's subconscious a lot. It's anger that isn't well articulated to their self.

Marsh: It's subconscious; you might have to take responsibility for yourself.

Holt: It's like they all needed Urban Minorities Workshop; or not about that subject, but they need just like take a look at, you know, look inside.

Marsh: Right. Because I hear all the time [that] the economy's not recovering, it's still just doing terribly in the jobless rates; terrible and nobody has a job. And that's not really true.

Holt: It is in big swaths of the country.

Marsh: Depends on; you know, you ask them do you have a high school education or do you have a better degree? Well actually, if you have a degree, probably you can get work; it depends. You might have to train.

Chessler: But if you're in West Virginia coal country you may be just [interrupted]

Marsh: If you're in West Virginia coal country with a high school education and you want to go work in the coal mines, you have a problem. And if you didn't finish high school because you're married to them [interrupted]

Chessler: But if you're in West Virginia and even have a better education, you may have a problem because the area is depressed.

Marsh: It depends on where you are and what you're doing.

Feay: And depends on if you have a job or not.

Marsh: It's good and it's bad, so [pause]

Misa: By way of conclusion, I wonder if I might ask are there any topics that we skipped over? Anything that you would like to discuss that we didn't ask?

Marsh: I would like to know what colleges are doing to offer courses that somehow are relevant for computer education because I'm not sure just taking a bunch of [computer] languages is where it's at anymore. We talked on there being so much shareware that some of the stuff we spent lots of time learning is now shareware. So how are the colleges adapting to that to attract women and make the classes relevant?

Misa: There's an experiment that Carnegie Mellon did; you know they're a computing powerhouse, have had fabulous faculty and research for decades and decades. They ended up instituting a requirement that people coming in had programming experience, and that was a tremendous bar because it happened that high school boys got programming experience in high school, girls did not. So they basically just did away with it; they said no, what we're not teaching here is just programming so there's no reason to have that as an entry prerequisite like calculus would be for some different programs for different majors. And so they did that and they also tried to do some restructuring and made some changes; added some very supportive deans; far-seeing faculty; and it took their proportion of women from — I forget what it was — down around 10 percent, and came close to 40 or 45 percent. So people are looking at something like that. Well if Carnegie Mellon can do it, that doesn't mean that every single place is going to be able to draw on that 35 percent of really talented women because there's probably just not enough. But it does suggest that you can change a college program; get rid of filters that take high school girls out of the picture. Carnegie Mellon said no, we're not teaching programming alone, we're teaching [computing] principles, we're teaching database, we're teaching computer organization. We want to

do security. We want to do cryptography. That has something to do with programming. That's one of the examples that's been written up and people study it; and some people try to emulate it, plus or minus. But that's an instance where the question of programming, the nature of computer science, the nature of prerequisites, was all shifted around by Carnegie.

Marsh: Where are the computer jobs right now? Do the colleges know where they are? I mean, I could guess but I would think it's in like maybe medical, automotive, what else?

Misa: Here's the problem . . .

Marsh: . . . advertising involving maps?

Misa: . . . and several of you know this personally; you don't need a computer science degree to do computer science. You have to have at some point in time, somebody has to get a medical degree to practice medicine but you don't have to have a computer science degree to practice computer science.

Marsh: That was my advice to my daughter — take computer science but don't major in computer science; major in something else.

Feay: Two, you need two degrees; and one of them should be computer science.

Marsh: Why would you need computers? You need to have that background but major in something . . .

Feay: Whatever you do; but do something.

Marsh: . . . whatever you do but major in something; but do something else. Don't just make that your only thing, do something else.

Chessler: But your comment about Carnegie Mellon makes me wonder has there been any study of comparing the colleges, and which ones have higher numbers of women, and what are the best practices for bringing women in? So is Carnegie Mellon alone in its 40 percent?

Misa: No.

Chessler: And what are the others doing?

Misa: Harvey Mudd is another one. Maria Klawe was involved with that. She's nationally known, technical education expert and highly respected. She did something similar at Harvey Mudd. Different college, to be sure, but best practices are something people are trying to sort out now. During this [decrease in women] that I described from the 1980s to now, more or less, it was historically the case that the highest prestige computer science programs had the fewest women. I mean, it flies in the face of common

sense but there you have it; that the MITs and the Stanfords and the Carnegie Mellons of the world had the fewest proportion of women in their [computer] science students.

Chessler: Interesting.

Misa: And credit Carnegie Mellon for trying to change that. They admitted really, really bright students of both genders; they're collecting just as many fabulous awards and prizes as they ever did. And the strategy of an elite place like Carnegie Mellon, or MIT, or Stanford, or some other place [might] be replicated by second tier universities or third tier universities. But people are trying to figure out what are the lessons that can be learned? There's NSF's ADVANCE Program. There's mentoring — everybody's doing mentoring — they're doing mentoring at high school levels, they're doing mentoring at the junior college levels, there's this army of mentors going out and trying to connect with girls before they become somehow turned off by math, or turned off by sciences, or turned off by whatever. One of the reasons that we're here around the table is to see if there's some part of your experiences that would be helpful in trying to make this picture realistic. There's also a temptation to be too simple; change one thing and then the problem will go away. No, of course not; it's a culture shift as much as anything. This is kind of the root of my question: how does this day-by-day connect to the yearly things? Is it enough just to do the yearly things? The answer seems to be no, we need some mechanism that takes the year-by-year; or once every three years we go to a workshop, but then if it's the case that a substantial proportion of people a month later have reverted, then you need something more; policies, a supportive environment, or bosses that take

the policies and actually put them in place. There's no easy answer. If there was *any* easy answer, somebody would've stumbled on it 10 years ago. There aren't easy answers to this problem.

Holt: Assuming there's sort of a steady state of percentage of females and males who go on to college and go on to whatever, get degrees; there's been this drop in computer science. Where are there more women going into? What fields are absorbing them? What are they choosing differently?

Misa: Modestly — very modestly — they're going into engineering. Engineering started out as something like eight percent [women], now it's 12 percent or 13 percent or 14 percent. Some fields within engineering are doing much better. Biomedical engineering is much higher than that. Women are going into the biological sciences, the social sciences, they're going into chemistry, they're going into bio-something-or-other. Biomedical engineering is a good one because somebody who's got really good technical skills and wants to work in a challenging area where this artificial heart fixed somebody's grandmother.

Holt: I can see that; I can see a natural inclination.

Misa: I come from Minnesota where there's a lot of this and we have a very powerful biomedical engineering department; really, really, really strong. And that's where a big proportion of women in the science and engineering college are gravitating to that

department. They're doing a bunch of things right. The department is doing well but that seems to be a national trend.

Holt: And maybe more attorneys, more doctors, any of those other types of big fields?

Misa: Law basically became about 50/50 men and women pretty early on, almost 20 years ago. The medical field now I think is just slightly at 52 percent women; it's just about 50/50.

Holt: You're including nurses and doctors?

Misa: No, I'm talking about M.D.s.

Holt: M.D.s 52 percent women. That's interesting.

Misa: Nursing has always been a female [profession].

Marsh: In fact I think it's going the other way now, becoming more men.

Misa: More men are going into nursing.

Holt: Yes, well they had pretty low numbers to start with so any increase is [pause]

Misa: But in the 1970s, medical schools were an all-males club.

Marsh: Right.

Misa: And that changed in the 1980s.

Holt: But you know something, it just raises like the whole question.

Misa: So those numbers are about half/half, and then the computer science numbers came close to that, then they're going down — not computer science [alone], computing, because it's the white collar workforce, too.

Holt: But maybe selecting other [areas].

Marsh: I'm wondering if you have to say computing is really not necessarily an end to itself.

Holt: Yes, they may be choosing other very interesting, more current [pause]

Marsh: It's in everything; it's like everybody takes English in college, well everybody should take computers. It's just a basic part of who you are. And then you go do something else but you have to have the computing background as well. I'm thinking it's the explosion of computers in most areas. Perhaps computer science evolves to just a few

areas — math and video manipulation, encryption algorithms and security — stuff like that.

Holt: That's really big.

Marsh: I think it is big, but it's very theoretical and that I can understand; I don't see why women wouldn't be just as good at that as men, maybe better. But everything else [pause]

Misa: Studying the history of computer security, I have to say there's one area: intrusion-detections expert systems using artificial intelligence was basically pioneered by women.

Holt: Oh, really.

Misa: Dorothy Denning got involved with this, and she's the one that found other people and sort of recruited them and basically [pause]

Malleck: I think you did your master's thesis on that, right?

Misa: Did you study with Dorothy Denning?

Chessler: No, no, not Dorothy Denning. There was something I remember Helen doing something for her master's thesis that struck me at the time as being inventive.

Bauer: It was how to solve crossword puzzles.

[Laughter.]

Misa: Back to solutions then?

Bauer: Kind of artificial intelligence.

Feay: Oh yes.

Unknown: But expert systems aren't they like the conversation between a doctor and a patient, for example, if you ask the least question and go down these different paths; is that what that is? I'm not even sure.

Feay: That's one of them.

Misa: That's one type of expert system.

Unknown: That's one. What is another one, so I get it in my head; like what are they? I don't know.

Feay: I'm thinking when you call customer service and they have to go through their set of questions.

Unknown: Okay, so it is sort of; but that is stereotypically a female thing. It's almost like a conversation and like getting to — I don't even know what it is so what am I saying? But I wonder what draws women to it. Are you're saying just the founders, not necessarily that women are going [pause]

Misa: There's a big discussion within the computer security community, led by Gene Spafford [at Purdue], one of the leaders that says there's not enough women in this whole field, and they're saying that they're going to need 10,000 [or] 20,000 [or] 40,000 more computer security people [and] you can't get this without getting a lot more women in the field. But it happened that the expert systems that were involved with intrusion detection, and coming off of the work of Dorothy Denning, that's a whole field that's very common now. I think of expert systems as being a kind of a bottom-up approach to AI. Marvin Minsky talked about that; it was like a grand theory about how everything thinks and then you would get specific applications coming down. This was like the 1960s and 1970s. Expert systems was more like given big datasets, how do you build systems that can sort through big datasets and then build up some kind of intelligent-like responses without necessarily having a theory of knowledge or a top-down theory?.

Holt: That is far-sighted. I didn't know that.

Chessler: Makes me almost want to go back to school. [Laughs.]

Holt: Yes, I know. Is that the big data stuff?

Marsh: I think big data's a little different.

Holt: Different, okay. You can tell I'm not reading that literature.

Malleck: We probably need Anita to give us some coaching.

Holt: Yes, I know. [Laughter.] You ought to be on campuses; you ought to be doing career counseling.

Marsh: Except for security issues, which are very, very math related. But otherwise, a lot of it I think you need to have another field that you're interested in, and then basic computer knowledge. I don't know if computer science, except in a few isolated areas, is going to be a discipline, as it was whenever we got out of school. I think it's going to be a given.

Holt: It's like reading, writing, arithmetic, and CS.

Marsh: And computers. Yes, I think it's going to be a given.

Holt: Really.

Marsh: Really. It's just a given. You have to understand it. You have to understand how it works. And as far as big data, in my last job I spent lots and lots of time automating stuff. I don't know that I was totally successful, but I tried. But to sort through big data to look for certain things, and to look for anomalies. In other words, I looked for things that I knew were wrong and then I tried to figure out also was there stuff in there that I don't understand and therefore *might* be wrong, and requires a human to look at. So I think that you have to have a computer background for just about any job. Might make you a little more skeptical when you see statistics on everything. You think oh, I don't think so. You might spot false news a little sooner, if you have some of that background.

Misa: So you need an Artificial Intelligence expert system to spot false news. I think that sounds like a research program.

Marsh: In fact, there was an article on the net recently how some younger kids did put together exactly that false-news solution in a week's time using shareware. Facebook wasn't so sure it wanted it but yes, it would've solved the problem. They had it out there. So I think that IP's in encryption, and some of that is a slightly different area. It has to [be] rigorous and stuff like that. But I think that otherwise, maybe computer science is not a separate thing. It's got to have a purpose to it and a reason why you're doing it. So it's got to be some other thing that you're doing in computer science. If the other things attract women then you've got them from that.

Misa: So you wouldn't necessarily have to have a computer science degree but a computer background.

Marsh: No, but computer background, [and it] might have as many courses in computers as you would've had for a computer science degree when we were there.

Chessler: Computer science may still exist but it may be building the systems that you then [pause]

Marsh: And it may not even be that because it might be shareware. You might be inheriting that from somewhere else.

Chessler: Computers building the hardware computers, and the architecture of those computers.

Marsh: Even that's kind of; you know, it's evolving too.

Holt: I'm so out of it.

Marsh: So I am like, you know; like cracking the human genome. That used to be just terribly bad and take, what, years and years and years. Now you can do it in 20 minutes. Maybe it's an hour, but it's not really long. It's that sort of thing. If you didn't have a computer background you wouldn't even know how to start that. But that might interest a

person to go and become computer literate because they want to do this one certain thing that did interest them. I don't see how you can move on without computers.

Feay: Two-year-olds grow up using computers. I mean, so you don't have to do it on purpose. It happens.

Marsh: It just sort of happens. Yes, I think so. Unless you make it so difficult to get into those programs to do it, because you have an artificial requirement like yes, take programming before you can get in there. If you don't have that sort of stuff so that everybody learns these computer skills then I think maybe [pause]

Misa: Here's a puzzle that I have; two-year-olds and three-year-olds and four-year-olds are using computers but I use the word "consume" computers. They're using them toward some end of consuming a game or something like that. But they're not with the power of altering the program, the settings, except in the most simplistic way.

Marsh: No, they're not getting that background, so they would not be able to devise the new technology. You have to have a background, you're right. If you look at your Mac or your iPhone, there are applications galore, but they're applications you generally use what's there. You don't get to change anything.

Feay: But in a way, it's possible; lets you invent things. It's like; so if I know all these apps I could imagine a new app if it didn't exist. But so many exist.

Marsh: But would you be able to then develop that app? You might have to know a bit more.

Feay: I might have to find somebody. But I could do it.

Marsh: You might have to find somebody, but that underlying; I mean, you're at least knowing enough that you need some underlying knowledge that the app user doesn't normally have. So that underlying knowledge needs to be important as all the education.

Misa: Knowing what can be or could be is crucial, because otherwise you're just whatever, reading a newspaper and you have no idea of how the newspaper got formed. You're using Apple and you have no idea what choices people made.

Feay: How do they fill all the pages.

Marsh: Right.

Feay: And make the print bigger; there's an app for that. That's the answer; there's an app for that.

Marsh: But I know how to do that part. But there's all that good stuff underneath that you need to at least be aware of, no matter what you're doing. So keeping that just in

computer science, I'm not sure that's a good idea. I sort of think computer science ought to be a part of just about every major [interrupted]

Holt: You're on a mission.

Marsh: Yes, that's my mission.

Feay: But isn't it?

Marsh: No, not really.

Holt: Is it what?

Chessler: Using computers may a part of the other methods, but not the deeper level of understanding. It's kind of like when my husband and I talk about stuff, because he really is a computer geek. I can have a conversation with him because I have enough fundamental knowledge of computers that I can understand what he's talking about, even if I may not be current I can relate the concepts to things I know about. Whereas many friends who don't have that background, can't even begin to talk to them about it.

Marsh: Right. That's what I'd like to see, is I'd like to see some of the colleges — I don't know what level — I mean it's more detailed than the app but it's knowing what's

underneath the app and how to go find out more about it so you could do something intelligent with the computer.

Holt: Or you could write the specs for something intelligent. But that's really all you need; you're ready to write the specs.

Marsh: But you can't do that unless you know that there are [interrupted]

Holt: Wait, we don't code anymore. We just write specs.

Feay: But that's the hardest thing to do is to write requirements.

Holt: Yes, but you have to know [code] at some level.

Marsh: You have to know at least what's underneath there.

Chessler: You have to know what's feasible, what's not feasible.

Marsh: Right, and you can't do that without having some knowledge of the computer science stuff. I just think it ought to be a part of psychology, all the biomedicines, all the medical equipment, all the mechanical engineering stuff that goes on, all the civil engineering stuff. I mean, I could just see computers everywhere.

Misa: The computer science program at Stanford wasn't the first computer science program but it was widely emulated. The man who founded it [George Forsythe] had two phases: the first was to make computer science a discipline separate from math and separate from engineering; and then the second phase he said computer science as a discipline would be completely distributed, it won't exist as an entity. That's what you're saying.

Marsh: That's what I'm saying; I think it needs to be distributed.

Misa: And that didn't happen by [accident].

Chessler: Anita, I think you should be the president at Stanford. [Laughter.]

Holt: Or a close personal advisor.

Marsh: That's right. [Laughs.] Yes, that's where I see it going so I see where a discreet separate thing is maybe not where [pause]

Misa: That's why it got locked in because it's something that can be funded and is recognizable, and is legitimate, and it's a science for heaven's sake, computer science is put in the engineering science colleges.

Marsh: That's because it's descriptive but it's probably not a science; it's nice to put science in the name, it's not a science. But anyway, I digress.

Misa: But we kind of got stuck with that.

Marsh: We got stuck with it and I think maybe what we need to do now is to distribute it.

Misa: This has been a wonderful conversation, thank you so much. [As a thank you present] I brought three copies of *Gender Codes* and three copies of a collection of oral histories that John Cullinane did. He was one of the people in the 1960s that created the software products industry and he went through a bunch of our oral histories and under the title *Smarter Than Their Machines: Oral Histories of Pioneers in Interactive Computing*, he talked about all kinds of people doing time sharing, and he runs us into databases, and he's got the net worked in there. And I just thought this set of conversations could turn into some kind of a book like this.

Marsh: That would be cool.

Chessler: Mary and I want one of each color. One of each because we can swap easily.

Holt: We live across from each other; or maybe two blocks.

Misa: If it's pressing, by the way, and you can't make up your mind, I'd be happy to send all of you both copies but I couldn't actually put it into my luggage.

Marsh: Okay, I'll accept. Whichever one I don't get, I would like the other one, I really would.

Oh, Gene Amdahl.

You're generous.

Thank you very much. That's lovely. That's very nice.

Misa: John had these personal experiences with all these famous people. He was a hockey dad with Gene Amdahl, just on and on and on. It is sort of a story but then it connects to these people that had fundamental contributions.

Marsh: I want a copy of that. I've got the red one so I want a copy of the blue one.

Holt: She's a swap partner here, and you're here so you make sure you get the other one.

Malleck: Yes, we see each other at the luncheons all the time.

Marsh: Okay, but I wouldn't mind having one. I really would like it.

Holt: And thanks for letting us talk about one of our favorite subjects. It's not often that you get invited to ramble. It was very nice. This was fun seeing everybody, too.

Misa: This was far more than a ramble. This was a genuine pleasure for me and I feel kind of honored to be here. This whole research project has been really amazing and Joyce asked if I was going to — I told everyone that I have to explain how I got into this — by Joe Wosk. Joe Wosk's daughter, Julie Wosk, is a professional colleague of mine and we know one another from history of technology meetings. Julie came up to me once and said you know I've got this dad, he's worked with Bell Labs, and he'd really like to do an oral history. I was in Chicago, so I went down and talked to him for a while. Joe was the one who said oh yeah, yeah, I worked with this interesting group of women; you should talk with Joyce. So that was; I don't know whether it was the same trip, but it was very close to [when] we did that interview.

Bauer: Was Joe the Western Electric guy who had like 60 years of service or something?

Malleck: Yes, the tile floor on the way out the door.

Misa: So Joe connected me to you, Joyce, and you have connected me to this community. There was a kind of a nice trail I'd like to recognize. And Joe was also the first person that explained to me what ESS was. You know this is a stored program computer. But in the historical literature everybody thinks of [ESS] being like some sort

of switching machine from the 1920s, or something. I said Joe, this sounds a whole lot like a stored program computer. Oh yeah, he said of course, that's what it was. But this is one of those parts of Bell's own history that they wanted to not emphasize so much. But you know that. You were doing programming.

Malleck: Joe and I were the first couple that went off on a business trip together, and it took all kinds of approvals all the way along the line.

Ooh!

Malleck: Yeah, and he wanted me to meet his wife first.

[Laughter.]

Malleck: I'm not going to meet your wife.

Unknown: That's a great story!

Bauer: I just remember him being a real sweetie.

Holt: Were those the days you had to share a bedroom?

Malleck: No.

Holt: Well then there was no reason to meet his wife. [Laughs.] That's a funny story.

Misa: I think Joe passed away in the last year or so.

Malleck: I talked to him about a year before that because his wife had just passed away and I sent him a note.

Holt: Well thanks for pulling us all together. I was giving you all the credit.

Misa: Joyce has played an absolutely critical role. And it was also Joyce that I sent a sort of a help me out please. I had a proposal due to the Sloan Foundation due on Wednesday, [and] it was on Friday that I had sent an e-mail to Joyce saying gosh, I know you've got all these connections, can you please help me? By Monday morning I think I had six e-mails for this project, and maybe even from several of you. But I remember the scale of it because it was your e-mail list. That went into the Sloan Foundation and one of the questions always with any kind of a project will it actually get done? Give somebody money, but will it actually get done? Had a similar network of people involved with Univac and Lockheed Martin in the Twin Cities. [With] the two of those together, Sloan saw this, they said oh this is easy — so we'll just edit this out — they doubled the budget. They don't ever double the budget but they doubled the budget for this one. But that was the Friday afternoon; I ended up missing something else I felt obliged to go to but I thought no, I really need to get this [proposal] done. Bang, by Monday morning we had great evidence.

Malleck: I think that says something about this group of women and how strong they feel about things.

Misa: Exactly

Holt: That's definitely true. And then there's the election. Brings us back to reality.

Marsh: Yes. I have a sister who actually voted for him; I cannot believe it.

Malleck: Tom, one question for you. Did you find that this group meeting generated different kinds of things than you saw in the individual interviews?

Misa: Offhand yes, although not always in the way that I might have thought. I think that the hope that our [Sloan] program officer had was that there would be a lot more; oh, your individual memory sparks another memory, [and] that happened several times. But I think what was interesting is we got a sense of diversity because you formed a cohort that had very different careers. You had profoundly different experiences; you've done very different things. You've had contact with different parts of people from Ball Labs. And so sometimes the comment that I remember the; from my memories of the workshop in Illinois; well I never went to one. That's all helpful and that's something that would never have come out within a single interview; it would've been hard to elicit that because I wouldn't know which parts, you know, are the things that match and which parts are the

things that are divergent. So I think from my point of view that's really important to understand the diversity and the strength of the cohort; and the strength of this community is really quite notable. But it's not because you all had exactly the same career.

Holt: We didn't all work in the same groups. And I never thought about this fact that you're mentioning, but it really speaks to the spread of the tentacles that went out; you know, one level and somebody pulls somebody else in, and it was quite broad in a way, which I never really thought about.

Marsh: Because I didn't even know Joyce before another group got started; that's where I met you.

Malleck: At Lundstrip's.

Marsh: At Lundstrip's. I didn't know her through Bell Labs at all, even though we both worked there.

Malleck: I don't think I was ever in West.

Holt: Different locations, different parts of the company, different companies within AT&T, so there is a broader reach than I ever thought about before, actually.

Misa: Having done individual interviews it was very clear that you didn't have the same experience, and different job titles. But having that, sort of say, yes, so my understanding of the workshops or of affirmative action is different because of your different working experiences. It just nails down what I kind of had seen but I had never seen crystalized, so it was latent, in a way, but it was made clear. So thank you so much.