An Interview with

JAN SHARPLESS

OH 513

Conducted by Thomas J. Misa

on

14 January 2016

By Telephone

Charles Babbage Institute
Center for the History of Information Technology
University of Minnesota, Minneapolis

Jan Sharpless Interview

14 January 2016

Oral History 513

Abstract

Jan Sharpless graduated from Principia College in southern Illinois with a bachelor's degree in biology. Her father, an executive at Bell Labs, encouraged her to apply for a programmer training position and she was hired by Bell Labs in 1972. She describes several early programming experiences, aimed at solving practical problems experienced in the AT&T phone system. Working in New Jersey, she completed a master's degree at Rutgers in 1976, and describes working with Chen Foo, a talented scientist-programmer-manager who served as a valued mentor to her. One memorable multi-year project was Cosmos, which assisted with the assignment of phone numbers to subscribers. In 1981 she moved with her husband to the Chicago area, and joined the Indian Hill (Naperville IL) facility to work on 5ESS call processing. Promoted into management and soon becoming an executive, she describes performance reviews, affirmative action, and career management strategies. She retired from AT&T in 2006.

This material is based on work funded by the Alfred P. Sloan Foundation award B2014-07 "Tripling Women's Participation in Computing (1965-1985)."

Misa: My name is Tom Misa. It's the 14th of January 2016, and I'm talking this morning with Jan Sharpless. This is part of a set of interviews we're doing for the Sloan Foundation, looking at the careers and experiences of women who worked in the computing industry in the 1960s through the 1990s. Jan, I wonder if you could take us back to your childhood years and high school or junior high. Were there any activities, hobbies, or school subjects, something about your childhood years that attracted your attention that might have inclined you toward the later pursuit of a technical career?

Sharpless: I was always interested in science. I loved my science classes. Biology, I just had so much fun in. My father was he was a supervisor first, then a department head, then an executive at Bell Labs. Whenever I would go for help, I think he instilled in [laughs]; he would always ask me, he goes, what is the problem you are trying to solve. And I would sometimes just get so annoyed; I'm trying to solve this math problem! You know, what is the problem you're trying to solve? He instilled in me an approach to problem solving. Defining the problem, and then from there, working through the solution. I don't know whether I mentioned it [but] I hated math.

Misa: Hated math, okay.

Sharpless: I just hated math. So I found biology very enjoyable for the types of experiments that were done but it wasn't like real heavy math [laughs] at that point. I got my B.S. degree in biology from college.

Misa: Where did you go to college, please?

Sharpless: I went to Principia College. It's a small liberal arts school in southern Illinois. Not a big one. And when I went looking for a job in biology, I found all I could do with a B.S. was like wash test tubes. I was actually — what's the word I want — accepted into the doctoral program at Ohio State in biology, plant biology. I was thinking more like food chemistry type of thing but I really didn't want to go all the way for a doctorate and not know what I was about in the business world. So after watching me go on these interviews my dad said, you know they're hiring programmers. I had taken two programming classes at Principia. Hated them, because they were all math oriented. My dad said, 'You know they're hiring programmers at Bell Labs. Why don't you go for an interview?' I thought okay, let me give that a try. And lo and behold, they hired me with a B.S. in biology! I was at the lower end of the technical ranks, Senior Technical Associate, where most of the people with B.S. degrees going in had B.S. degrees in math, and they were hired as Associate Members of Technical Staff. But my revelation when I started working in industry, as opposed to the computer science classes that I had taken in college was that I could work on real world problems that didn't necessarily involve higher math. I mean, like I had taken calculus courses and I had done okay in them but I didn't love it.

Misa: Okay.

Sharpless: But one of the first programs I worked on [laughs] — this is going to sound so funny — in the telephone company, right? I was doing a program for these guys from C&P Telephone, Chesapeake and Potomac Telephone. They would get in a set of paper tapes every day that were readings off these little mechanical air pressure gauges that they had in their outside plant, in their telephone wires. And these little numbers would tell them basically whether there was a fault in their lines where they were losing air, which meant when it rained, water could get in that telephone line and cause a problem.

Misa: Right.

Sharpless: So I wrote this program that accepted their paper tapes and printed out where they had the problems. Up until that point, they had just been printing the content of the paper tapes and manually searching for these issues.

Misa: Oh wow.

Sharpless: I did this little program that printed out, oh, you should [check] here, here, and here. And this guy called me on the telephone like about three days after I installed the program on the timeshare system that they learned how to use, [he] calls me up and says this is fabulous! This is great! You're saving us like five hours a day. You know he was so happy. And that has stayed with me forever basically, as a motivation for why I liked the job.

Misa: Where in the Bell Labs system did you start work?

Sharpless: I was in Whippany [New Jersey] and what was it called at the time? Oh God, I don't remember the exact name, but basically it was a whole series of programs that involved outside plant and how to work the connection from the central office, you know where the big computers are now, all the way out to the premise, but not into the premise.

Misa: Okay.

Sharpless: That organization had recently moved from Holmdel up to Whippany, and as a consequence had lost almost all of their programmers. So there were probably about 10 of us that were hired all at once and that provided a very, very useful and fun environment because we were all learning at the same time, we were all of a similar age, and really we created a social group that hung together.

Misa: Right. Do you recall just roughly how many of the 10 were women at the time?

Sharpless: I'm going to say that probably eight out of the 10 were women.

Misa: Eight out of 10.

Sharpless: Yes, eight out of the 10, because I was hired in 1972, and this was right after — once again, my memory is really foggy — the federal government had gone after AT&T for discrimination and Bell Labs, I want to say it was like a consent decree.

Misa: Exactly, yes.

Sharpless: And Bell Labs was very focused on trying to get women into technical jobs. Now, grant that none of us was hired as MTS and in fact I remember there was one guy that came in who was hired — no, I'm sorry, all the men who came in, though, as MTS, Members of Technical Staff, had master's degrees. All of us that were hired as programmers had bachelor's degrees, and there was one woman in the group who was hired as an Associate Member of Technical Staff even though she had her master's degree. So even at that time there was still — Naomi Watts, I remember her because that was like a danger point for a lot of us — how is she a woman with a master's degree and she's an AMTS? That didn't make sense to us.

Misa: Not the full Member of Technical Staff, but hired in at a junior level.

Sharpless: Yes, an Associate Member of Technical Staff.

Misa: And she had a master's degree already in hand.

Sharpless: She did, and it was in statistics.

Misa: Statistics.

Sharpless: Yes, which Bell Labs had a lot of statisticians. So that was a little; you know, we were all like hmm, what's going on? The following year, it turned out that we didn't know that we were hired into something that was called the Courtship Program and our performance was reviewed for a year after we had been there. And if we were doing very well we were automatically put on — Bell Labs was running an OYOC program at the time, which was One Year on Campus, or the local program, Local University Part Time Program. All of us were put on the Local University Part Time Program to get our master's degrees in computer science. Because I didn't have a math degree, they put me on a special program, which I have to give them kudos for. I went and took my advanced calculus and differential equations, and finite math, and that kind of stuff before I started my master's degree in computer science and that was a year of agony for me. [Laughs.] It was just total agony.

Misa: You never had really had a positive experience with mathematics so this was a bit of a challenge.

Sharpless: I had taken first level, you know like year one of calculus in college but I had avoided math like the plague.

Misa: Wow.

Sharpless: So I got through the classes but I just hated every minute of it. I think I got As but I don't feel like I earned As, and it didn't come naturally to me, whereas the types of programs I was writing at that point, I loved to come in and write programs that would take a problem that somebody was having, break it down into logical steps, and be able to spit out answers. Mechanize it, basically.

Misa: Right.

Sharpless: So then I started at Rutgers for my master's degree, and that was an experience of I would say highs and lows. I got all As but one B. I really enjoyed the operating system class. I liked the compiler class but the professor was an asshole. Out of 35 students in that class, all but two people got incompletes because he spent the entire semester on parsing and then we had a week to do the interpreter and the code generator.

Misa: Oh good gravy.

Sharpless: Yes, it was just horrendous. And the way the coursework was laid out, you end up taking the operating system class and the compiler class at the same time, and you got an incomplete in one of the two of them because you just couldn't do those projects. I had an experience in my computer science class in college where I worked so hard to get this program — you know we would get like a deck of cards and then you had to rearrange them into something that was working — and you did your runs, and it was a

math thing. It just would bug me that I would work hours on this project and the professor would do one run and give you a grade. It was like I got no feedback about how I was doing in terms of what was working for me, what wasn't, why was this series of cards together not right, and this other stuff was? It was like you only were coding in order to produce that one single run as an output. And in that compiler class, I had the same difficulty; I worked my butt off all summer, was able to turn it in by the deadline so I could get my grade before starting my second year fall semester. He like did one run, it worked, and he gave you an A.

Misa: [Laughing.] Hours and hours of your time.

Sharpless: My life, [laughs] my life! So my whole college experience in computer science was for the most part very negative. I loved the operating systems class.

Misa: What was interesting about that for you?

Sharpless: I loved the logic of deadlocks, and queueing, and handling interrupts coming in, all that kind of stuff I really liked because to me — and as I said, I liked the compiler course, I liked breaking down the parsing and stuff, I just had such a bad taste in my mouth from the way the guy taught it — the operating systems class, I enjoyed that. Then the worst one I took — if you can believe something that was worse than my compiler experience — you had to take, I can't remember the name of the class, but it was basically a math class where you were taking math problems and writing computer

programs to solve it. And I made it through all my homework assignments because I could take the time to figure out what the problem was all about. I got As on all my assignments; I got an A on the midterm; I was really sweating the final exam, just sweating it. And I got in there and it was like my worst nightmare of hell came true. He gave us a word problem on — I still remember this — the trajectory of a rocket and we were supposed to know that equation, he didn't give it to us. We were supposed to know that equation and then write the program. I had never memorized the trajectory of a rocket; I had no idea what it was. If you were a math major I think you could derive it but I was so mentally unhinged at that point [laughs] it was just awful. That was the class I got a B in. I went and talked to the professor afterwards and he said you just screwed up on the final. He said, you got a C on the final. Well anyway, I was at that point, work was almost my refuge because I loved writing these programs. So that's kind of my background of how I got into it.

Misa: At Rutgers, you were taking these classes part time or full time?

Sharpless: Part time.

Misa: Part time, so in addition to work you were doing these demanding computer and math oriented courses. That must have been a busy time.

Sharpless: It was very busy, plus I got married and actually, getting married was great. So your first year of the Local University Part Time, you took three classes and you

worked I want to say three days a week. So they gave you two days off to study and go to classes. The second year, you got one day off, worked four days, and you took two classes. So compared to what some other people were doing while they were there, going on their own time to get master's degrees, this was heaven for us. I got married between my first year and my second year, and it was so wonderful because the second year, I could come home, my husband made me dinner, I didn't have to worry about going out on dates with him. [Laughs.] So that definitely worked to my benefit. I had taken all the classes that were pretty intense the first year, so the second year I did a computer graphics class and I got a lot of help to make it through because of the mathematical models to rotate cubes, that kind of thing.

Misa: Oh, right.

Sharpless: And that was not a fun class for me, but because it was only one of two I felt like I could spend more time focusing on figuring out how to do that. I took a research class on papers, that was enormously interesting to me. Plus, during this timeframe I got transferred from the organization where I was writing these programs for outside plants, and I ended up in a group — this is a little historical here — so inside telephone offices, you've got the big computer that does all of your telephone switching. But in order to connect your port in that computer to the wire that goes to the house, you went through something that was called a mainframe. On one side of the frame there were all the connections from the computer, these individual ports, you could think of them as like the telephone numbers, and on the other side of the frame were all of the terminations from

the wires that went out to the houses; so you could think of those as the addresses. In order to give you telephone service, one of the things that needed to happen was to run a jumbo wire from the telephone number they wanted to give you to the address that you were at. You can imagine that these mainframes, they basically would go with the mushroom in telecommunication services, these mainframes started what they would call "guying" because they would get so chocked with wires. Because when your service was disconnected, the technician that did that, no metric was taken on the wire getting taken out of this mainframe so these guys — and women — would just leave the wire in there. They would connect both ends. Why try to pull this thing out? Sometimes it would go a block. These mainframes were huge. So a new frame got designed that had panels that were six inches wide, telephone numbers on one side, one panel, and next to it were addresses, and then telephone numbers and addresses. The theory was you could do a jumper that was only six inches long and voila! None of the mainframe garbage and the technicians would be willing to pull the wire out. Well, duh, the clerk in the office that was assigning telephone numbers to addresses didn't know how to make these connections very close. They started installing these modern mainframes, and they died in two years, which is extraordinary.

Misa: In two years, brand new equipment.

Sharpless: In two years, a huge investment just down the drain. And the supervisor I ended up working for, after looking at this problem — his name was Chen Foo — he was of Chinese descent. His parents had given him money and told him to get out of the

country when Mao Tse-tung came in, and he had made his way through China, over to Taiwan, had gotten on a boat, made it to the United States, and he had a letter from his family, which was Catholic, and they had gotten him an entré into one of the Catholic universities in the United States. Chen Foo was brilliant. He got his Ph.D. When he came in for an interview at Bell Labs, with Ph.D.s they would set you up with a group that was doing research, trying to solve some problem, and they would introduce the problem to the Ph.D. and just how far you could get with it and what kind of input you could give. Chen Foo solved our problem.

Misa: [Laughing] Better hire this guy.

Sharpless: They hired him on the spot. Anyway, so he studied the problem of what was going wrong with these mainframes and it was like, dude, you need a computer program here that the clerks use to assign the telephone number to the line equipment so that they're closely located on the mainframe. You guys like missed the whole point of doing this.

Misa: Oh, because they could still be physically quite separate. I see.

Sharpless: Yes, they were getting assigned physically quite separate because nobody had changed the assignment process. Even though the theory was oh, it should be a short wire, well it wasn't. And so I got transferred over because this program that Chen had originated was proving to be hugely successful, more features were being added, and of

course they were understaffed. I was assigned into Chen's group, which was probably besides my father, he was the person who most influenced me in computer science. He was just such an intelligent individual, very caring, interested in understanding what you were doing. He was one of those amazing people who was brilliant technically and who was savvy interpersonally.

Misa: Really. Doesn't always go together.

Sharpless: Doesn't always happen. So I think I spent probably five years in Chen's group and enjoyed every minute of it and made it through my master's alive. He was my supervisor for both years and I would've had a total meltdown and quit if I hadn't had Chen as my supervisor during the first year of my master's degree. He allowed me to take the extra time when I needed it. He was understanding that I was trying to plan a wedding. Later, I said something like, 'Chen, you must have thought I was off my rocker.' [Laughs.] He said, 'No, I could see that you were intelligent, that you were smart, this was just a hump you needed to get over, and that there was a lot of opportunity for you in the future.' After I finished my master's degree, he started loading that opportunity on me, for which I was very grateful. And my aha moment programming in industry was the assignment algorithm that was the heart of the system. So figuring out the line equipment, the telephone number, the cable pair, and getting them located close together was one of these myths of our system. By this time we probably had 50 people working on the system. It was one of the myths that Charles Storer — Charlie Storer wrote it — and everybody was like oh my God, if you have to go in and change it, it's

awful. Oh, this is miserable, you know, oh my God, this is bad. And Charlie left the company, probably because he got sick and tired of trying to change his code. And Chen gave it to me. And I'm like oh my God, what can I do with this? How can I — oh — oh. I sat down and I analyzed the program and it turned out it was — this was the first time that I was taking over somebody else's program, not writing my own — and it was like one of the worst written programs. I mean, I couldn't believe that it had been written as bad as it was, when really it was a bunch of do-loops and some logic in there to decrease the time you're in the do-loops by taking good answers rather than looking for the best answer.

Misa: Ah, okay.

Sharpless: And I rewrote the thing; and it was like amazing to be able to update it; it ran like three times as fast; and it spit out good assignments. And I was like — this was another high point in my life — I was thrilled! [Laughs.] And that gave me so much confidence as a programmer; that has always stuck with me and I loved that time that I worked on the system called Cosmos.

Misa: Cosmos.

Sharpless: And I loved the people. Once again it was a younger group of people, and my talent for writing and analyzing software really, I think, was showcased and so I was nominated to be a supervisor. The week that I was going to go down in Holmdel for a

supervisor's job, my husband, who also worked at Bell Labs, and he was in hardware, was offered a supervisor position in Indian Hill in Illinois. And it was like, oh my God, what are we going to do? Finally decided, at that point the makeup of most projects was moving way more software, like 80 percent software and 20 percent hardware. So the opportunity for hardware promotions was obviously less, and there were a lot of older guys in hardware, whereas software was growing. Decided to take the position in Indian Hill for him, and I would move out there with this tag that said I was promotable but basically I knew I would have to prove myself all over again to the people at Indian Hill. So we moved.

Misa: Oh, okay.

Sharpless: So we moved. Do you want me to keep going here?

Misa: Roughly, Jan, that would've been when?

Sharpless: That was 1981 when we moved, January of 1981 when we moved out here.

Misa: January 1981, okay.

Sharpless: Right. I finished my master's degree in 1976. [I] got married in 1975, so I was hired in 1972. I started doing the math work, the math crunch in 1973 — oh no, it would've been 1974 when I did the math work. So I was hired in 1972, and in 1973 and

then 1974 I started the math work, and in 1975 and 1976 I went to Rutgers. So then 1977, 1978, 1979, 1980, a little bit of 1981, full time on the Cosmos project. So we moved out to Indian Hill, 1981, and probably many of the people you spoke to came from Indian Hill, I think.

Misa: A cluster that were part of that group, yes. That's kind of the center of gravity, at least for the Bell Labs women.

Sharpless: Yes, and that's how my name got to you, was from that cluster.

Misa: Right.

Sharpless: But there were really no women's groups in Whippany. I think I was really, really fortunate in working for a non-white individual male. There was a female department head at Indian Hill, her name was Verna Hoover. You know, there's a female department head; she was extraordinarily part of the male persona. I don't want to be cruel [but] she did not go out of her way to support women at all. You know it was purely based on technical. And so I was pretty fortunate that I joined and had Chen Foo as my supervisor. [There was] a cluster of women who were hired at the same time as I was, but the project that I went into had also gotten new hires at the same time, basically, and then my group was added in. And we were in such a crunch that anybody who could make good contributions was valued. There wasn't any of the male/female thing going on, and that I think was really important. Plus, there was this overall aura because of the consent

decree, of a need to get more women on track for better opportunity. When I moved out to Indian Hill, sure, that was a much more diverse population overall than it was at Whippany. [Laughs.] That was the good news. The bad news was I thought I worked at a sweat shop before but we used to go out for lunch. At Indian Hill, I started working on the brand new switching system, the 5ESS. Oh my God, I didn't know what hard work was until I got on that. They were so cramped for space, I actually had a desk in my supervisor's office.

Misa: Oh, quite elegant there.

Sharpless: That as intimidating, however, I had self-confidence at that point because of the work that I had had. My supervisor was also a very smart guy. A lot of people ended up hating him but he was very, very smart. He didn't put me in a corner because I was new, he loaded me right into the mainstream. I was able to choose the group that I wanted to go into. I chose call processing because I figured at least I know how to pick up a telephone and dial a call. I don't know what goes on behind that, but when people started throwing out like audit, system integrity, maintenance, I'm like I have no idea what that stuff is; at least I know what a phone call is.

Misa: Yes.

Sharpless: I ended up working on tones and announcements, three-way calling, call waiting, and call forwarding working with the other people that were already assigned to

that. I was able to make some breakthroughs. One, I found an error in the compiler that had been written. Some of my stuff wouldn't work and I was positive it was a compiler error, and sure enough it was.

Misa: In the compiler, that's the tool that you're using to write the software.

Sharpless: And to generate the machine code that went into the switching system.

Misa: Right. So somewhere along the line an error had crept in that nobody had been able to identify before.

Sharpless: Right. And I did that I think about two months after I was there, and Jerry's eyes — he was a perverse guy — he sometimes took joy in the discomfort of others is a polite way of saying it. And he just had so much fun going to these supervisor review meetings. Every morning they would meet for like two hours to go through every single problem that was open on the switch and he just had such a good time getting the system guys, the people with the compiler, to admit it was their problem.

Misa: That's not supposed to happen. [Laughs.]

Sharpless: I got tones and announcements running. We were in the lab all night. I mean like we're talking about weeks. Indian Hill during those days ran three shifts for the lab where the 5ESS switch was, so you could download your software and test it on the

switch. We had no desk environment to simulate and so you would work either 8:00-6:00, 6:00 to midnight, or midnight to 8:00. And it was just chaotic.

Misa: So it wasn't really simulation, it was actually being loaded right onto the hardware of 5ESS? Or was there some software emulation?

Sharpless: No, the simulation actually came later where we would load that onto our desktops and be able to simulate our code. But at that time period, we would take our code that we had written — bugs and all — go into the system lab and download it literally into the memory of the 5ESS switch and then start making phone calls to see it if worked.

Misa: Wow.

Sharpless: It was an amazing learning experience. I can look back on it now, it was a tremendous learning experience, but it was so painful. One of the reasons I chose to work for Jerry, not only was he the call handling telephone group and call features group, but from my interviews, he just struck me as the brightest supervisor that I talked to. Sure enough, six months after I got there he got promoted to a department head and I was promoted to take his group. So that was 1982 and at that point, this Women in Management group sucked me in, and invited me in. I probably had a different experience than some of the others; I ***feel*** like I had a different experience than some of the other women did. I appreciated going to the meetings and meeting them, and creating

a network. I felt like — oh, this is one thing I wanted to say — so my husband was a supervisor, and he was a supervisor on the 5ESS project as well. So when I was promoted to supervisor, we were both going to these morning meetings. We wouldn't sit next to each other, but more so than the Women in Supervision group, Herb and I had an enormous resource in each other because he was writing the hardware for call processing and I was doing the software. I can't tell you — we rode to work the entire time, as long as we were going to both be there at the same time — and I can't tell you how many technical discussions we had, how many gossip discussions we had, and sharing of news that we had that was pretty much unfettered. And would I have made it through without him? Yes, I'm sure I would have, but it just; I just knew a lot more about that project being able to talk to him about the hardware side of it. I probably never would have had that close a connection with another hardware supervisor.

Misa: Right.

Sharpless: I did build close connections with other supervisors and had talks about what's going on, and going out to lunch, and share notes, and stuff like that. But I mean like we had to sit in the car together every day. [Laughs.] And you just talk about things that are affecting you. We were building a house at the time so we would talk about the house, and what we were going to do, and all that other stuff. But we spent time talking about what was going on. And did you hear about what happened to so-and-so at the meeting — that type of thing that would be difficult to share. The other thing is I had a department head, Hans Orring, that [laughs] when I started working for him, I absolutely

hated him because he looked over my shoulder the entire time and I couldn't wait to get out of his department. As soon as the first version of our switch went to the field and it was running, and people could make telephone calls, it wasn't collapsing all the time, I asked for a transfer over to another department head, Bob Royer. The first staff meeting I was in with Bob Royer I knew that it had been a mistake to leave Hans Orring.

Misa: Oh really?

Sharpless: Yes. I guess as an engineer, I worked for a couple of different supervisors, and when I got Chen I knew I had gotten a good one. As a department heard, I mean as a supervisor, Hans was my first department head and I had observed other department heads at this management meeting, and Hans was always very quiet, I didn't think that he talked out that much, here he was looking over my shoulder all the time, you know all of that. Bob Royer had impressed me as a mover and shaker, and when I got over to Bob Royer I knew I'd been wrong so I started looking for reasons to go back to Hans' department. [Laughs.] And I was nervous about it because before I left his department I gave him feedback and I told him what I liked about working for him, and I told him I felt like he was looking over my shoulder and I wasn't free to come up with my own approaches unless I checked things with him. So I had given him that feedback. When an opening occurred in his department to work on call processing for the third release, I went over and asked him if he would consider me for the job. He brought me in for it, and I enjoyed working for him for the next, I think it was probably, another two or three years before he moved off. I was always very grateful that I had given him all the

feedback because the second time around was really good. [Laughs.] We had a fun time working together and I got a lot more flexibility and space. He told me later that he was concerned because I was a new supervisor and, in the point fingers atmosphere of that first release, he looked out for all his supervisors because he didn't want them to get in any trouble. So that was his approach and we came eye-to-eye with that. So I would say I started picking up mentors who were male out there: Jerry Johnson, my first supervisor; Hans Orring; when I worked with Bob Royer, we got along well. When I was interviewing for the job we moved out to Indian Hill for, I talked to the executive director of the whole organization and it turned out that Bob Nowak had joined the labs as a TA, a Technical Assistant, which was one level lower than me, and had worked his way up to being basically one of the vice presidents of the company. I guess I impressed him when I talked with him because he became a supporter for me, got me into the job that I wanted with Jerry Johnson, and in meetings, he would take time to talk to me afterwards. I think that I was able to pick up supporters like that because some of the other women you talked to were very vocal and persistent about the fact that women were just as good as men, and definitely needed to be treated equally and given equal opportunity. As a supervisor I started doing some of that within my own organization, and championing women, and meeting with them, engineering level, in order to prepare them to be a supervisor. I made it a point to know the women in my organization who — not just my department but like my whole lab, which is probably about 200 or 300 people — to know the women who were highly rated and to try to get to know some of them and talk to some of them. It turned out that that was very good because many of those women did get

into supervision. One of the women that I got to know, Mary Zajak, she and I ended up being vice presidents together in the same organization at a later time in our life.

Misa: Wow, neat.

Sharpless: We acted as kind of a watch guard at performance reviews, and I found that as long as you were — how do I want to say this — fair about praising all good people, whether they were white male, white female, Asian female, Asian male, African American female, African American male that your credibility would go up as other people would interact with them and substantiate your opinion. Did I make mistakes? Sure. But by and large, I think my evaluation of the talent was usually pretty good and I got support then for women moving up.

Misa: The performance reviews played a really [big part]. I mean, they're important for any organization. My sense is that at Bell Labs at the time, they had kind of a special edge.

Sharpless: Vicious. [Laughs.]

Misa: Yes, they were very hard, very strong. Can you describe the character of the performance review meetings?

Sharpless: Sure. [Still laughing.] One department head and I were talking — was Mark a supervisor? Yes, I think we were supervisors, but for some reason we were in the same discussion group in the same organization. We were talking about the different people in the organization and we got down to this one person who was truly, you know, near the bottom of the list and Mark comes out with, 'this guy's a door knob.' That was it. And you know, it was like such a mental image of this person as a door knob, but you know, those types of comments came out. Bell Labs, the organization — I think it was true across Bell Labs — rated people numerically. I mean there was a number one, there was a number two, there was a number three, all the way down to 57 out of the supervisors, or number 83 out of the department. And as such, there was intense discussion and comparison and argument about who had more talent or more potential than somebody else. We spent a lot of time on theory, you know, how much should current work versus potential count? Should you put somebody up a little higher because of their potential? All the different qualities, such as communication ability, ability to lead, perceptiveness, strength at solving problems, I mean there were lists of characteristics that were circulated that we were supposed to review people on. We would do performance review in December or January, I think it was. I hated it because you had write up these lengthy dossiers on the individual. You really had to write your notes for a talk you had to give to substantiate why you would put this person at the group and at the level that you thought they should be slotted in. And you had to rank your own group, your engineers; or as a department head, your supervisors; or as an executive, all your department heads. You had to rank them in numerical order and you couldn't have everybody at the top of the list even though we all thought that. And it just was a huge undertaking, you know, a real

time suck. And yet people still complained that they weren't getting good performance feedback because there's always those intangibles about how somebody enters the room, how they present their data, you know all of that that gets wrapped up into a performance review. It got particularly nasty when we started having to lay off people, as well.

Misa: Oh, that would be very hard.

Sharpless: Yes, very, very hard. I mean it was tough before that you had to tell somebody that they were in the bottom quartile, but even worse when you knew that that bottom quartile would be gone in six months. And there were women in the management group, you know, that would get that message from their supervisor, from their department head, that they were in the bottom quartile and that they had to leave. I think in the later years, just it seemed like there were; well we would do diversity audits — I shouldn't say that — whenever we would fire people we would do diversity audits, including age audits. To be honest, diversity was always in — how would I say it — in spec. It was what you would expect that the incoming population that was being considered, but it always seemed like, you know, there were so — I don't want to say so few women — but there was a lower percentage of women, a lower percentage of African Americans, a lower percentage of Asians, and because of all the discussions on performance review and everything else, you knew those people. You knew who the six African Americans were, who were supervisors in the organization. And when one of them left, it felt diminished, I would say. It felt diminished, even though the numbers were fine, the presence diminished. That was true for the Asians and the women as well.

And so the perception of — oh my gosh there's fewer women in management, or there's fewer African Americans in management, how am I ever going to get there? — I think increased. It was hard, it was really hard, and it seemed like some, well as is the case when you're taking just a broad spectrum of people, some of the people who were let go were very active in their affirmative action, in their community and were very active in supporting members of their community. So when a person like that leaves, it's even more painful for the people who remain. So anyway, now that I've rambled for like, oh my God, I've taken up so much of your time; I'm sorry. [Laughs.] It was like a core dump.

Misa: Well, no it's really interesting, Jan, because it's like a texture and your own observations come from where you were. Can you help me understand about when the layoffs began to occur? I can make some guesses.

Sharpless: I think it was mid-1990s, like 1996. Right around. It was before the dot-com failure. Well no, I think it was right around that time that the layoffs started. We had one, I think, in early maybe 1990 or 1991. Occasionally we would have some small ones if a project got cancelled, but it was like the mixture, you were hiring people again. I think it was the mid-1990s when we really stopped hiring people, *per se*, and the cuts were deeper, deeper, and deeper. Something else I was going to say. It escaped me.

Misa: Your observation was an important one and can I just repeat it to make sure that I understand?

Sharpless: Yes.

Misa: Because of the diversity audits, you think probably that the number of people in one of the protected classes, or protected community, it seemed normal, but you know them. You said there were six African American managers at a certain level, and you knew each one of them so if one of them was laid off, it cut to the bone.

Sharpless: Yes, that's exactly true. Yes. I know because I went through those diversity audits and it was completely above board. There was no target population and nobody was cut deeper than other populations but gosh, when you know those six people and you've met with them as a group, and fought with them, and one of them leaves, it leaves a bigger hole than when you meet with, say, 22 white males and four of them go. You know you still have 15, no 18 left. See? There's my math problem. [Laughs.]

Misa: Yes, there you go. I thought at some time that the performance reviews were loosened up just a bit, so that you put people into categories — top, middle, and bottom — rather this rank order. Is that right?

Sharpless: We did. I think that started to happen when I was promoted to an executive level, from department head to executive; I think that was about when it started to happen. Well, it could have been slightly before that. I think it might've been like 1988 or oh no, it had to be later than that. [laughs] I have to tell you a funny story — it was

probably early 1990s, like 1990-91. So during this time period after I was promoted to department head, my husband and I had a daughter and we had her in day care at a place that was known as Little Bell Labs because so many Bell Labs people had their children in that day care center. When we were going through one of these performance reviews when I was a department head, and my husband was in the same performance review discussion group, another department head in there. And I think there were probably like, there had to have been like 30 department heads, or 20 department heads in the laboratory at that time. And I had somebody who was coming up for discussion so my husband said I'll go pick up Laura and bring her back, because we couldn't leave her at day care. So he went over, picked her up and brought her back, and he brings her into the meeting. He asked Ed Prell was the executive, 'Is this okay?' Ed goes, 'Sure, go ahead.' No, wait, we were supervisors and it was all the supervisors that were there, and the department heads, and Ed Prell; that's right. No, couldn't have been; had to have been department heads. Anyway, it doesn't matter. We gave her a little game or something, she's like five years old or four years old. She's sitting over in the corner and she's doing that and a couple of people who were sitting next to her were keeping her occupied by giving her paper and pencil and everything. And at the end of the meeting, it was like seven o'clock and we're all standing around talking, and Laura said, 'Who won the contest?'

[LAUGHING.] Oh my God!

Misa: She picked up that there was some kind of a competitive process.

Sharpless: A contest going on there. The group of us that were around her we just broke up into laughter, and then we kind of looked at each other like oh my God, how true is it that that's what this has been. So that was another telling remark from the mouth of a child about what we were doing. It did ease up a bit when we put people into groups but you could only have so many people in a group and that added 90 percent of people think they're above 50 percent. It was difficult no matter what, and we still had to write up all the dossiers and you had to edit the dossiers because the dossiers were, you know, you got like a booklet of them and you were supposed to read them, and decide who was supposed to go into which category; kind of your mental image of the person and whether if you knew them, did you think the write-up accurately reflected their performance; and oh man. [Heavy sigh.] That was not the fun part. I think I enjoyed being a supervisor the most because you were still involved in the technical work, and you were really helping people grow technically. I enjoyed being a department head because at that point, you could [go] on vacation and the supervisors knew how to run the department. [Laughs.] You didn't have to worry about it anymore. And I did enjoy working with the supervisors. By the time I got to be an executive, even if I had been offered a higher level job I don't think I would've taken it because by the time the problems got up to you, so many smart people had tried to solve them and couldn't find a reasonable solution. My one executive that ended up being a strong supporter for me, Ed Prell, I remember once he said fight like hell until a decision is made, then leap to the other side and support it; which is something that makes an organization work well because you have to align on that decision, on that goal, and everybody has to make it work. Sometimes the stuff that come up at the executive level is because people wouldn't align, they wouldn't believe it

was the right decision. But I'm getting off track there, I'm sorry, we're talking about women and management.

Misa: At the executive level, is that a position as a director then?

Sharpless: No, it goes supervisor, director, then executive. So like when I was an executive, my organization ranged from, I think I had a minimum of probably 200 people up to 2200 at one point.

Misa: Jan, what was your title as executive?

Sharpless: I have to go look at my business card. [Laughs.] I was the 5ESS; I have to go look at a business card. I can do that later and send it to you.

Misa: That's fine. It's not a point, I just wanted to make sure that the detail is part of the record, it's interesting to see.

Sharpless: Yes. I've got some of those business cards; I haven't looked at them in a number of years. [Laughs.] But I think the other things that happened when the layoffs started was that the protected groups became worried that if they spoke out too much about their issues, and what they wanted, that that would be perceived not as helping the organization but as criticizing the organization and would be treated in performance

review as why isn't this person spending their time getting the project to work instead of listing the reasons why another African American should be promoted to supervisor.

Misa: Unfortunately it's the case that I think that occurred within more than just one. It occurred for sure for very specific reason within AT&T but that was not unique to AT&T. There were lots of other mainline corporations and I think it shocked a lot of people that all of a sudden, that you could go to work for a company that you thought you'd be retiring from, and that didn't happen. In the 1970s, that was a period of great expansion and people, in a way, had the freedom, whether they chose to exercise it or not, to say no, this isn't working, this needs to be changed. In the 1980s and 1990s there is a change in the way that corporate America was hiring and then running into bumpy times.

Sharpless: I detected a — how do I want to say — a cultural shift from in the 1980s and 1970s, with the amount of growth that was happening with companies, the culture I think was okay, people of all different colors and genders have potential and have the ability to make a contribution. How do we help them do that, to fulfill that promise? Because you didn't get hired into Bell Labs unless you were a pretty good student, and you were able to coherently communicate, right? So it was how do we help these people really blend in, but shine and be able to contribute? Then when the dot-com came along and the firing started, I think it shifted to you know, there's tons of talent out there; either you make it or break it here. If you can't do it, we'll find somebody else who can. And that shift, I think, it definitely changed the environment of how women operated in the company.

Misa: And there's actually a follow-on effect, too; it's not only what an individual person might experience in his or her own work, but then it's also the way that policies might be practiced. The policies might be the same but the practice might shift.

Sharpless: Now, I have to say, my daughter is in electrical engineering.

Misa: Oh that's great.

Sharpless: Yes. And she got her undergrad from Cornell, and she did her graduate work at Stanford. And once she went to California, she's not coming back. She works for Cisco now.

Misa: Yes.

Sharpless: Are you going to interview any people from Cisco?

Misa: No, I don't think so, at least not with this round of the study. It'd be interesting to be able to expand this and to deal with a second generation, like your daughter. That'd be fabulous.

Sharpless: Okay, well, when you are interested in that, ping me again, because I can set you up with her. It's interesting for me to talk with her because I feel that she is getting a — how do I want to say — a network; that Cisco supports diversity, and that they're

being more active at listening to concerns than when I left Bell Labs, if that makes sense. It's not to the level of what I experienced when I went to Indian Hill, when there was a group of women and they met with managers, and stuff like that, but there are certainly groups of diverse people at Cisco. And Cisco in fact, in some of them, has set them up. She was just asked to join Women in Leadership Forum. She's an engineer, so it would be interesting I think for you to look at Cisco and what they're doing. I'm seeing the world now through my daughter's eyes and comparing that to what I went through over the course of my career.

Misa: Yes, once again you get your home network, not only with your husband, but then with your daughter, you can have really interesting conversations about that.
[Laughter.]

Sharpless: That's right. She's also openly gay, and she was nominated by Cisco to attend the —what is it — something that's sponsored by Coca Cola about emerging leaders who are gay, something like that. So she has to write a biography and I was talking to her on the phone last night and she was like Mom, can I send this to you and can you look at it?
[Laughter.]

Misa: That's great.

Sharpless: She said I'm so glad I have you for a mom, that you can look at this stuff and understand it.

Misa: Right.

Sharpless: So role models you know do play a lot. You know, my dad, and now me for my daughter, I think help considerably and that's something as you say, that needs to spring out in college and grade school. That happens. What other questions are on your list?

Misa: Jan, this was just about the time where I was going to say thank you so much, and just ask the question about whether there was any additional material, stories, or observations that you'd like to include. Just one thing, though, I don't think I know when you left Bell.

Sharpless: I retired, actually, of my own volition in 2006.

Misa: 2006, okay.

Sharpless: Yes. That was when the announcement was made for the merge with Alcatel. I was 56, and I had been thinking about retirement and just decided at that point if I was going to stay, I needed to sign on for two or three more years in order to get my organization through the merger. And I didn't have the energy or the desire to do that, so after everything else, and more layoffs, I just [said], you know, nope, this isn't for me, so I retired.

Misa: It sounds lucky that you were able to choose the time that it was right for you to step down and retire.

Sharpless: I was.

Misa: Good for you.

Sharpless: Well thank you. This has been enjoyable talking to you. You did a lot of listening; thank you for listening.

Misa: Yes. Well I feel like that's one way of learning, too. You've got an amazing story to tell and I think we recorded some part of that today.

Sharpless: Okay. Good. Thank you.

Misa: Great. Thank you so much.