

SWE GRASSROOTS ORAL HISTORY PROJECT

Sharon Cascadden Interview

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Society Of Women Engineers National Conference

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Sharon Cascadden Interview

Sharon Cascadden began pursuing a degree in chemistry and astronomy at the University of California Los Angeles in 1956, but married a classmate in 1958 and left college before completing her degree in order to raise their children. In 1974 Cascadden enrolled as a part-time student at California State University Northridge, this time studying engineering. While there, she joined the Society of Women Engineers and chartered a collegiate section at the university. She completed her engineering degree in 1981 while working at Hughes Missile Systems and retired in 1999 from Hughes Space and Communications. She was a Fellow of the Society of Women Engineers and a recipient of its Distinguished New Engineer and Distinguished Service awards. Cascadden passed away in 2013.

In her 2009 SWE Grassroots Oral History Project interview, Cascadden described her experiences as a student in the Chemistry Department at UCLA and as reentry student in engineering at Call State Northridge; her career and the challenges of non-destructive materials testing; and her experience with the Society of Women Engineers.

- July 2016

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Troy Eller: Today is October 13th, 2009, and I am here with Sharon Cascadden, who is a fellow of the Society of Women Engineers. She retired from Hughes Space and Communications, and you were a lead staff engineer?

Sharon Cascadden: Well, I was a staff engineer.

TE: A staff engineer in non-destructive evaluation. And the interviewer is Troy Eller. We are at the SWE National Conference in Long Beach, California. And I'd like to thank you for joining me today.

SC: Oh, my pleasure.

TE: To begin with, could you tell me a little bit about where you were born and raised?

SC: I was born in Los Angeles, strangely enough, but my dad was a geologist and worked a number of places. So, I lived in several states when I was too young to remember it. I know we were in Kansas when my sister was born, when I was four. But shortly after that we moved back to California. We were in Taft for a few years and that's where my brother was born, eight years after I was. Then we moved to Bakersfield, and I was—I grew up in Bakersfield, California, basically. Which means I ought to love country music, but I don't (laughs). I went to East Bakersfield High School, and did pretty well there, and had no problem being accepted to UCLA. I didn't even really consider going to any other school because that's where my dad went. So, of course I was going to go to UCLA. I think now maybe it was a little naïve (laughs), but it worked out.

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I started as a chemistry major, because at that time—actually, everybody took an aptitude test during the senior year of high school to give you an idea what fields you'd be well-prepared for. And I did very well in the math, and the science, and the English, and actually, I think pretty well in all parts of the test. So, they came back with suggestions of potential careers—so I could be a teacher, a nurse, a librarian, (pauses). I don't remember what else, but it didn't really strike me as what I wanted to do. And it wasn't until years later I realized, well, I had to check that little box that said "female." If I checked the box that said "male" and had the same scores, it probably would have come up engineer, doctor, various other things (laughs). And they can't do that kind of testing anymore—they can't discriminate like that—but they sure did back in the mid-fifties.

So, I entered UCLA as chemistry major because that was the only physical science that had any significant number of women. About ten percent of professional chemists were women, and I found out later a lot of the ten percent tended to be bottle washers, not the cutting edge researchers.

It's even more naïve, but in junior high, in eighth grade, I had decided I was going to get my bachelor's degree in chemistry at UCLA, get my master's degree in chemistry in nuclear chemistry at UC Berkeley, because that's where they were, at that time, discovering the transuranium elements. And Glenn Seaborg was pretty well known, and I actually met him once and asked him if this made sense, and he said, "Oh, sounds very good." And then I was heading up to develop the first nuclear-powered rocket ship to the moon. That was 1952.

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TE: Okay. (laughs)

SC: (laughs) And if it happened along the way that I met somebody who was compatible, I might get married, but it was not a high priority when I was in junior high.

So I started as a chemistry major and enjoyed it, but I also was involved in the folk dance club at UCLA, because I started doing some folk dancing in high school, and through that I got into the exhibition group. One of the things we did was go to the beginning classes and show them some of the more advanced dances they could learn, eventually, if they stuck with it, and then we stayed and danced with the class.

Well, when I did that in one particular class—in full Ukrainian costume—there were only about seven men, I think, of 31, and only one of those seven men didn't seem to have two left feet. And we managed to get acquainted, and I managed to need a little help with my calculus now and then, because he was physics major two years ahead of me. Within a year and a half of the time I met him, we were married (laughs).

And we have now been married for fifty-one-and-a-half years. So it worked out very well. If it hadn't been for the folk dance club, we never would have crossed paths. Were very grateful that it happened. Were both pretty happy with it—we've got three grown kids who are mostly self-sufficient. And two lovely grandsons. And both now retired and staying very busy. And certainly the Society of Women Engineers is one of my major activities (laughs).

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TE: I've seen that from your resume—your list of activities, yes (laughs).

SC: (laughs)

TE: So, stepping back, as a woman in the chemistry department, studying chemistry, what was that like?

SC: The chemistry was not too bad, because there were a fair number of women there. What I omitted and was kind of important, is that not too long after we got married, I got pregnant—this was before the pill and there wasn't as much of control over that sort of thing. And so I had to drop out of school. UCLA does not like—the entire University of California system does not like part-time students. They don't want you worrying about a family, or a job, or any of those mundane things, they want you taking a full schedule, and there was no way I could do that. And we ended up having three kids fairly close together.

So, while they were young, I continued taking night school classes towards—well originally towards a chemistry degree, and then it occurred to me finally, as they were older, I could go into engineering. And there's this other school, Cal State Northridge, which is closer and much more cooperative about part-time students. I ended up going there after being out of school for quite some time. And taking it very, very seriously, which I've found is true of most returning students. And getting very good grades—in the engineering I tended to get A's. And hadn't used any real math, especially not calculus, until I had to take the differential

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equations class, and I got through that with a C. So I figured if I can get a C in differential equations, I can do anything (laughs).

And I did do it only part-time, because the kids were still in junior high and high school. As they got older, it became a little easier. They learned to do some things around the house that some of their friends never had to do, like cooking, and planning meals. They only had to do one a week, but they each had to plan one a week, and do the cooking. I would do the shopping, they would do the cooking, and the others would do the clean-up, and I would go off and study, like men [?]. And it worked out very well.

It took me quite a while to get through, because I hadn't had any engineering classes at all. But I had senior standing with all the classes [that I had taken] at UCLA. I'm really very, very grateful and count myself lucky that I ended up at Cal State Northridge, because there the classes were much smaller, you got to know the professor, not just the teaching assistant. They had office hours where you could go in and say, "Larry, I thought I understood this. And I got this far and then I ran into this brick wall—what am I doing wrong?" And he'd help me though it, and fifteen, twenty, thirty minutes later I'd come out saying, "Hey, I got it. I got it." (laughs) And so I got to know a large proportion of the faculty on a first name basis.

One of the most important faculty members at that time, for me, was Bonnie Campbell. Dr. Bonnie Campbell, who much later was honored as the SWE Engineering Educator [Distinguished Engineering Educator Award], because she

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was the one who introduced me to the Society of Women Engineers. And she took me to an affair down at the Aerospace Corporation, which was geared towards women college students, to tell us about the sort of opportunities there are. And the Aerospace Corporation is really a unique company—I'm sure you'll be interviewing people from there.

But that's where I first heard that there was this thing called the Society of Women Engineers, and most of the people who spoke at that were SWE members. And so, I said, "Are there student sections?" "Oh yes, there are student sections." And I got the information on what we needed to do, and Bonnie and I got the section chartered at Cal State Northridge, in about a year from the time I first heard about it. I was the charter president. (laughs) Strong-armed mostly.

Well, actually, Bonnie first had gotten all the women engineering students together, because most of us never saw any of the others. There were twenty-five. Out of one thousand engineering students, twenty-five were female. And it was really kind of nice to see others—and so the opportunity to have an organization where we got together more, and I could immediately see from that very first meeting we went to, the networking, the opportunity to learn from working engineers about the field, and opportunities, I mean it was just—

I knew from my experience with other organizations while my kids were growing up—I was active in PTA and League of Women Voters, and Girl Scouts. I was never the sort of just stay home and be a housewife anyway. But I knew from

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those that networking and contacts are so vital for learning what you need to learn and forgetting to do the things you want to do, that I could see immediately that the Society of Women Engineers was much more than just a student section, it was this national organization. So, when we had our charter banquet we had the national second vice president Ada Pressman as our featured speaker. She lived in the Los Angeles area—was an active member of the Los Angeles section. I didn't realize until somewhat later what a coup that was. (laughs) And I've been very active in SWE ever since.

But I didn't actually graduate from Cal State Northridge—I entered UCLA in 1956, dropped out towards end of '58, entered Northridge officially in 1974, and got my degree in December of 1980. So it was a long span. (laughs) And I took a lot of classes I might not of had to, but really enjoyed the engineering.

Both of the jobs I've had since graduation were through SWE contacts. Which is (laughs) one of the reasons I was also thinking, you know, “really good organization.” The first one was of a friend of mine who was a member of the student section, took my resume—I was looking for a summer job, and she took my resume to her boss at Hughes Missile Systems, which was out in the San Fernando Valley, not too terribly far from the school. And he said, “Well, I really don't need anybody this summer, but I know somebody else who might, so I'll pass it on.” And they called me in for an interview and it worked out very nicely.

I had had experience by that time being a teaching assistant for the material science lab, and actually developing one of the new experiments that we did in the

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material science lab. And, so, that experience plus (pauses) possibly my maturity, (laughs) I think influenced it, and I started working there. What did they call it? It was a laboratory where they did various kinds of—a test laboratory for various developments for the missiles.

TE: Engineering Materials Laboratory. (laughs)

SC: (laughs) How about that? (laughs) Anyway, it turned out to be a very good fit, because I developed there some new things—I learned a lot by working on the various things they had going on, but they also gave me the freedom to develop some new things on my own. Like, first thing I did was develop a fixture to find the modulus of rupture of an—oh, this has been too long—of a ceramic substrate. It was a new idea to bind ceramic substrates. The ceramic printed circuits were quite new at the time. This was before 1980, so it'd be about '78. They don't expand much, but the aluminum does, and missiles get pretty hot when they're traveling. So, we had to find how much of a strain this ceramic could take before it would break. And the company that made it wouldn't tell us, which may be that they never tested it that way. (laughs) I don't know. But anyway, that was kind of fun, coming up with something that actually worked and gave very useful information.

And I continued at Missile Systems once I graduated from Cal State Northridge. I told my boss at that time, "You know, this is the only time in my life I can go out openly and interview with anybody and everybody, because I'm just graduating." And he says, "But," and I said, "But I really like what I'm doing here. I would like

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to stay.” And he said, “Yeah, we're working on an offer, but Hughes doesn't work real fast, so we'll let you know as soon as we have it. (laughs) So, I did—I mean it was kind of fun to be able to interview with a lot of other companies, but it turned out that Hughes did make me a much better offer than anybody else would.

And in fact, my boss had to argue with their human resources people a little bit, because they're saying, “We don't give graduates this kind of a salary.” Sounded like an awful lot at the time, \$500 a week. (laughs) Of course, that was 1980, so it was a lot more money then. But my boss said, “But she's been doing graduate-level work. She's been doing, you know—she's not been doing student-level work, she's been doing this graduate-level work.” And they finally agreed it definitely was better than any of the other job offers I had.

So I was happy there for another year-and-a-half or two, and then things were cutting back there badly. We didn't get the contracts that we were hoping, we built—actually at that point, Hughes built the prototype, did the design and prototypes in Canoga Park in the San Fernando Valley, but the missiles were actually built in Tucson, Arizona. Which really wasn't a terrific arrangement, but the only logical thing would be to move the design and stuff to Tucson, not the other way around. And anytime there were rumors of that happening the engineers would just say, “Well, that's fine, they can go ahead and do that and I'll just go and work for somebody else.” Well, it got to the point where they couldn't say that (laughs) anymore. There were some significant lay-offs, and I was told

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that I was going to be phase one of a three-phase lay-off, but it wouldn't be for six months yet. So, it was a long lead-time, and in the meantime I could be looking for things, and they would do their best to help me find something else within Hughes.

So then I went to the SWE National Conference, representing [Hughes] Missile Systems Company at the career fair, saying, "We need electrical engineers, and computer science people, but we don't need mechanical engineers, do you know anybody who does?" The gal from the Space and Communications part of Hughes said, "Well, yeah, we do." So we had a little discussion about what I'd done, and she said, "You know, I think I have a job description here that fits you really well. It has to do with testing, and it's non-destructive testing, rather than the destructive testing you've been doing." So, she took my resume at that time—it wasn't all electronic—and took it back, and within a week I had a call from somebody at Space and Communications and we arranged for me to come down and have an interview, and seemed to go very well. And a couple of days later—I don't remember if I called them or they called me, but it was, "How soon can you start?"

TE: Excellent. (laughs)

SC: (laughs) I said, "Well! (clears throat) It means traveling a lot further to get there, because it was in El Segundo instead of Canoga Park, but my husband was already working there, so that wouldn't be bad. That turned out to be excellent, because then—although I never helped build a nuclear-powered rocket to the

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moon, I did build, or participated in the building of a lot of structures that went out into space. I don't think I would've been happy with missiles for the rest of my life. The space aspect was much more interesting. And the job I had doing non-destructive evaluation of the structures meant that I got to work on every single satellite that was built, mostly before the electronics went on it.

And it started out as a fairly simple thing because the structures then were just aluminum honeycomb, aluminum face sheet—very lightweight structures, but very simple structures. And what we did with our non-destructive evaluation was prove that the face sheet was bonded to the honeycomb core, and if it was not, we would mark where the problem was so it could be repaired. And as the years went on, things got more complicated. We got into the non-metallic things that required different kinds of testing, got into embedded heat pipes and other stuff inside the honeycomb core. More complex tubing, and a lot of graphite-epoxy things that were very different from the aluminum.

So, the job was always a challenge, there was always something new. And the more we could do the more, the more we were asked to do. (laughs) And I'm not sure my own management really appreciated it very much, but I know a lot of the project managers did, and even some of the customers, especially from the defense program. So, it was a very satisfying career—and I had no desire to go into management. One of the few people, I think, to stick with the specialty, but there were so few of us doing the non-destructive evaluation—I started out working for one fellow who did not have an engineering degree. In fact, I'm not

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sure he was thrilled with the idea of having somebody with an engineering degree working for him, but he was told by his management that he would have. And I think they had looked far enough to see that it probably needed to be somebody with a more formal education. And he left about two years after I got there, and I was next in line. One time I had four other people working for me. Sometimes it was only one, it was sort of up and down, depending how contracts were going. But it was always an interesting job, and very detailed, very focused. I found I had better luck with the women who worked with me than the men, because the women were more willing to take the time to do precisely, which is very important when the repairs have to be done.

TE: Certainly. (laughs)

SC: (laughs) If you're going to repair it right, you need to know just where it needs to be repaired. And some of the fellas didn't want to take the time to do it that accurately. But anyway, I enjoyed the job, but then the time came that they were re-organizing again. Somehow it seems like things got re-organized every three to four years, and I worked for Hughes for a total of twenty years.

When I was really eligible to retire, at full benefits, and stayed there a little longer, but, again it was getting—there was another re-organization and some more cutting back and what not. I said, "I'll go, I'll retire." (laughs) Well, and part of it was my boss, my department manager two levels up at that point, wanted to outsource the non-destructive evaluation. And so my last job—which I thought was a really dumb idea—my last job was to make a list of the advantages and

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the disadvantages. And the list of advantages was much shorter than the list of disadvantages, like, you're not going to get somebody else to come in at two o'clock in the morning just because you heard something go "crack" during the vibration testing. Because I also did a lot of damage assessment. (laughs) Didn't like to do damage assessment (laughs), but it had to be done. That occasionally meant I was dangling on a diving board (laughs), out over a two hundred and fifty million dollar satellite, trying to reach that place over there where they think it might have started coming apart. (sighs)

But again, the work itself was nice, the politics got a little sticky. I also had to make up a list of companies, sources that I thought could take over the non-destructive evaluation. One of them was the Aerospace Corporation—I got to know several of the people there and their material science lab pretty well, because they did the same sort of thing. And we sort of helped each other, actually, on developing processes. And there were a couple other places where I thought people were well-enough trained to do it right, if they had the proper standards to tell, "Okay, this is bad and this is good on the standard, therefore on the real part, this is—." Although, it was never so nice and black and white, there was an awful lot of grey areas. But anyway, I understand that the outsourcing didn't last very long—they finally had to hire somebody and because it simply didn't work to have an outside company come in. The work was not scheduled far enough ahead of time to know when it was going to be available for the testing, and it was just not very complicated. But anyway, they never called me back, so—

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TE: (laughs)

SC: (laughs)

TE: So, you retired in 1999, was it?

SC: Yeah, November 1999. So it's been almost ten years now.

TE: And you started at the communications—what was the name?

SC: Space and Communications. That was in the summer of 1983.

TE: When you started were there many other women engineers?

SC: Not many at all. In fact I think I read about the time I graduated that, of, nationally, about one half of one percent of working engineers were women. It was somewhat higher than that at Hughes, and I think they tended to be a bit above the national average. But it still—there were not many. (laughs) It's better now I believe. I know a number of active members of the Los Angeles section who are working at what is now Boeing—it became Boeing like three months after I retired. Another large portion of Hughes became Raytheon—all the defense systems were bought by Raytheon. It's really strange to see how much the big names on buildings have changed over the years. There are certainly only a few companies left compared to the fairly large number that were twenty years ago, thirty years ago. (laughs)

TE: Stepping back to when you were at Northridge, when you were studying at Northridge. I read that you had worked with Dr. Campbell on a women in

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engineering career facilitation project for re-entry students like yourself. Could you tell me more about that?

SC: Actually, not for ones like me, because I hadn't gotten a degree yet, but this was something funded through the National Science Foundation that Bonnie had put together, and it was really a very ambitious program. She somehow—and it must have been an interesting process, I'll have to ask her sometime how she found the people to be in it. But she was seeking women who already had degrees in engineering or something math or science, but who were not working in careers related like that. Some were teachers, some were librarians, a whole variety of—or not working at all. And they were brought in for a very high-powered summer session of—brush up on math and physics, and then very fast track, two years of engineering. And also, they had a co-op—she had lined up companies and they were working at jobs as co-op things, working part-time and going to school part-time.

A number of them actually who already had bachelor's degrees did end up getting master's degrees in engineering. All of the ones who survived it—and that wasn't all of them, but it was a majority—had this certificate of completion. I got to know quite a few of them because I was the teaching assistant for the material science lab that they took. And it really was interesting. When I came back to school—after being out for so long, except for night school classes—I took it very seriously, and I really felt I had to get A's, I just had to. The first time I got a B, I

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thought, “Oh! I’m a failure.” A week later it finally penetrated, “A B is not a fail.”

(laughs)

But they took it very seriously, they did a very good job. The material science lab required doing experiments and writing up the experimental procedure, and the data, and the results. One of my rules for their classes, and the regular students, was that you’re not going to get the full ten points unless you write something at the end that shows that you thought about what this experiment means. You can go through all the steps and process the data and come up with an answer. And that’s fine—you can get a nine if you do it perfectly. But you’re not going to get that tenth point until you really think about it.

Well, these gals in the facilitation program did most of it. And I ended up giving quite a few tens in those classes, but the average student wouldn’t bother to do that. And they were happy with eights and nines most (laughs) of the time, if they were doing it right. (laughs) I found out much later, from somebody else, that at least somebody—and I’m not sure how widespread it was—somebody referred to me, as the teaching assistant, as “the dragon lady.” (laughs)

TE: (laughs)

SC: Couldn’t quite figure out if that was an insult or a compliment. (laughs)

TE: (laughs)

SC: But it was a really interesting laboratory because you learn so much about different materials. And it’s really basic engineering, not so much analytical, but

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getting a feel for how materials will act under various conditions. If you did well in that class the chances are you were going to do well in a lot of the others, but if you brushed it off and didn't bother to learn the stuff, you could have some major problems in other things—unless you were a computer science person, and that's a whole different thing. (laughs)

TE: So, did you find out how many of the women who went through this program, how many of them went into engineering careers?

SC: I would have to ask Bonnie. I think she started with around sixty, but that might not be right. But I think about forty of them actually got through it, and most of them ended up working in the field. Many of them stayed with the companies where they've done the co-op work, if it was one where they liked it. (laughs) But it really did make a difference in their lives.

The first year they were there, that summer towards the end of their intensive math and science review, our student section of SWE, which had been going for, I think, maybe one or two years at that point—well, it was the end of our first full year as a student section. We put on a special workshop for them, and brought in engineers from the field, to talk about what it is really like out there and what they should expect. And why they shouldn't apologize for being where they are.

(laughs) Actually, the first couple of years I was at Northridge as an engineering major, I felt a little out of place because here I was, older than one of my professors, and sort of felt I was taking up space, maybe a younger student should have or something. But I finally realized that wasn't really the case. And I

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really didn't have anything to apologize for, and this is something I felt was important to get across to these gals before they really plunged into the engineering.

That year our student section won a national award for best student section because of all things we'd done. And that was one of the major things, was this workshop, and I had many of the career facilitation gals mention afterwards that they were so grateful that we'd done that. And I remember one of the things that came up in that was assertiveness training. Not aggressive, but assertive, and one of the things we needed to learn to say was, "No, I don't make the coffee."

TE: (laughs)

SC: Because that was sort of what was expected from any woman in the room at the time. (laughs) So, it never actually came up for me, directly. (laughs) But it's funny how that sort of thing was very much needed by these gals, and they just did really wonderfully well. It was an excellent program—she had several, I think, at least two other groups after that first one that I didn't get to know as well because by then I graduated. But it was, I think, a very important project, and very good use of National Science Foundation funds. (laughs)

TE: While you were a student at Northridge, what was it like to be a woman engineering student.

SC: Well, like I say, I sort of apologized at first, and then found I was getting good grades and doing well. In the laboratories where we had to work as groups, and

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that's really an important things for engineers to learn, is to work as a group. (laughs) And I think that's one of the main reasons the laboratories are so important. But I pulled my own weight there and, again, I was (laughs) old enough to be the mother of some of the kids I was in school with. We worked together pretty well. I do remember (laughs) after one—I don't remember which laboratory it was, but it was I think when I was doing the junior level stuff—that one fella at the end of the semester said, "You know, this worked out better than I thought—I didn't think I was going to like having you as a lab partner. I didn't think you were going to be able to do it, but it worked out pretty well."

TE: (laughs)

SC: Not a backhanded compliment, but—and this was a kid who was young enough to be my kid. (laughs) But on the whole, there was really not much problem. Like I say, I got to know a lot of the faculty on a first name basis, partly from the activities with SWE. And I also got involved with the American Society for Mechanical Engineering, because I was a mechanical engineer with material science, in particular. And that group during the time I was president, grew from about twenty-five students to almost a hundred—and a lot more activities. I have to admit, having being involved in PTA, and League of Women Voters, and Girl Scouts, I had learned a great deal about how to get people to work together and how to keep things going in the right direction. (laughs) And I had much more

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organizational experience than any of the others I was working with. And it was definitely beneficial.

TE: So those skills transferred to your job?

SC: Absolutely. Absolutely.

TE: Did you have many women faculty members?

SC: Bonnie Campbell was the only one at that time. I think they added one in the computer science end before I graduated. But (phone ringing). You need to get that?

TE: Let me pause—

[BREAK IN RECORDING]

TE: Okay, we're back. (laughs)

SC: Okay. (laughs)

TE: So, Dr. Campbell was the only faculty member in mechanical?

SC: At the time I started, she was the only female instructor in the whole department of engineering and computer science. Which eventually became a school of engineering and computer science and did add some others, and has a fair number of women professors now. But Bonnie was the first one and for some reason they put her office on the only floor of the engineering building that did not have a ladies' room on it.

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TE: Really?

SC: Yes, she's pointed that out a few times.

TE: (laughs)

SC: (laughs) She had to go up a flight, or down a flight, to get to a restroom. It's the sort of oblivious thing that can happen with administration. I'm sure it never occurred to whoever assigned her to that room, but it certainly wasn't convenient.
(laughs)

TE: No. So, were the men's restrooms on all the floors?

SC: There were men's restrooms on all four floors, but the women's were only first, second, and fourth.

TE: And she wound up on the third floor?

SC: Yes, yes. It was nutty.

TE: Did you have any male professors who were mentors to you or who greatly worked with you or influenced your career?

SC: Well, I was first a grader and then a research assistant for one of the profs. And I would say, yeah, he was probably an excellent mentor. I didn't really think of it that way at the time, and what I was doing for him was computer programming. He had developed this very complicated program and now was tweaking it with small changes, and so I was helping. What I was doing was figuring out the

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programming to do these little tweaking things. From that I could have gone into computer science, but I really liked the material stuff better.

But I really did not have any profs who discouraged me in any way. It was a very supportive group at Cal State Northridge. Several of the instructors for the junior- and especially the senior-level classes were people actually working in industry. And these classes were only given at night. And part-time students were not a problem at Cal State Northridge. So I could take two or three night school classes, and be at home when my kids still needed me to be at home. And working with the guys who were actually working in industry, giving real-life examples of how this stuff works (laughs) was definitely a benefit.

While I was still a UCLA, a good deal earlier, one of the calculus classes I took I didn't do real well and it turned out afterwards that I wasn't the only one who had a problem. But the professor obviously did not care for women—I think he resented having to teach a lower level class to begin with. But he was taking it out on—well, there was one other gal in the class when we started the first day, and she was not there the second day. And I should have picked up on that.

(laughs) Somebody told her something, you know, “stay out of his class.”

Because he'd huff and puff, up and down, “Well, gentlemen—and you.” That was not a pleasant class. (laughs) That was at UCLA, and that was the mathematics department anyway.

But Cal State Northridge, the profs really were very supportive and encouraging. Like I said, I got to know a lot of them on a first-name basis. Really, I did enjoy

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my time there, although I was glad I didn't have to take a real full-time schedule. Although, when my kids were a little older and I could take more, I ended up being a teaching assistant, and that took up time. But that also gave me more experience and I think was useful in my engineering career also.

TE: Could you tell me more about—you were a member of the L.A. Section of SWE?

SC: Yes.

TE: Could you tell me more about some of the activities and programs that you have worked on in L.A. Section and also nationally.

SC: Well, L.A.'s always had a strong interest, as I think most professional sections do, in career guidance. Mostly, originally, it was working with college students and then eventually working high school and down into elementary school, realizing that girls need to be told early on that it's okay to be interested in this kind of stuff. And there are some neat careers, and besides, it pays pretty well. (laughs) And you're not as likely to get laid off as if you're working in a bank or a grocery store or something like that. So the career guidance have always been very important. I have sort of dropped out of that over the last seven or eight years, because I feel it makes much more sense for it to be the young, working engineers going to the colleges and high school and elementary schools, and talking about that sort of thing. (laughs) So I don't fit in as well, but I do still help with the Girl Scout day, if it comes at a time when I'm not out of town or something.

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SWE L.A., being so big, it covers a very large area. Has a lot of things going on, but they tend to be—well, some of them are large events where we get people coming from all over, and others are ones that are just in little pockets. I've been involved in a couple of the SWE leadership programs in 19—was it 1980?

TE: I know there was one in 1980.

SC: Yeah, 1980 because it was the year before we hosted the national conference in 1981, national convention it was still then. And I'd gotten to know a lot of the gals in the L.A. Section pretty well. Even though I hadn't quite graduated—well, graduated at the end of 1980. So I helped with the planning, and carrying out of that leadership conference—that was the first major project like that that I worked on with L.A. section. I'd already been asked if I would chair the student conference, part of the national convention for 1981 that was held at the Disneyland hotel. That was really an amazing project. I worked with some really wonderful people, some of whom I still see, fairly regularly. I loved the national conventions because I see some of my best friends once a year. (laughs) But there are a number who've gone to other parts of the country since then. I'm still in L.A., they've gone elsewhere, but we really enjoy getting together.

That's one reason the ice cream social [at the annual conference] is so important, because you have a chance to see these people you haven't seen for a year. (laughs) [unintelligible] Apparently it was very unusual for a student—at the time I was listed as the chair of the student conference, I was still a student, I hadn't yet graduated. That apparently was very unusual. (laughs) That was a

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really remarkable conference, I think. We called it “Engineering, Applied Magic,” at Disneyland. A symposium on the future. And apparently it aroused—or irritated some of the national executive board at the time, because we didn’t have only female speakers, we had some male speakers. But we’re talking about a symposium on the future, and there weren’t that many women out there in the position to talk about the kind of things we wanted.

The keynote speaker was Ray Bradbury. And he really gave a wonderful keynote speech, because he wasn’t talking about his wonderful science fiction stuff—I mean, I’ve been a Bradbury fan for decades and decades. But he was talking about the future, and how it was going to be for his daughters. And how groups like ours were going to make it better, for his daughters, and his daughter’s daughters. And it was really—I wish (laughs), I wish now I had a copy of that speech because it was really remarkable.

It was a highly successful conference. And at that time, the student conference came first. It was the first part of the week. And then there was one day that was career fair, interviews, and it was a very small thing and they only wanted to talk to the students, they didn’t want to talk to the professional engineers. And that was usually held at a university, or in ’81 it was at the Conestoga Inn, which is a hotel, oh, about an eighth of a mile from the Disneyland Hotel. But we had decided that we wanted to really encourage students that year to stay for the whole week. It was okay, in fact it was encouraged, for students to stay for the convention part that was geared more towards the professionals.

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The gal who was the chair of the whole shebang for that conference, Anita Gale, was president of SWE L.A. when I graduated. And we got to be very good friends—she's one of the ones I see at SWE conventions, but probably not otherwise. And she had told me early on, before I graduated, attend the SWE convention, go to everything you can. Try to stay for the whole thing, go to everything you can. And talk to the engineers and learn about things, and all you have to do is say, "Tell me about your job." And they'll go on.

TE: (laughs)

SC: And I didn't have to do anything. (laughs) She said, "Consider it an investment in your future," and that's exactly what it was. I have been to every national conference, since 1978—Atlanta, Georgia. And then '79 was in San Francisco, where they did make a big point of only having female speakers. And it was there that Anita found out that L.A. would be hosting the national conference in '81, and that's when she said to me, "How would you like to be the chair of the student conference?" And I had to think about it a little bit. (laughs) 'Cause I knew it was a big responsibility, but I'd been to two of them by that time—well, that was my second one, and I had definite ideas already.

And so in '81 we did have a noticeable number of students staying for the whole thing. I'm still in contact with a few of those who say it was really sort of a mind-changing thing, about what you can do. And so, I strongly advised students to talk to engineers, that they don't have to be women. But find out what they like and what they don't like about their job, before you get serious about accepting

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something at a particular company, if you can talk to somebody who's there and they can warn you—well, I don't want to say "warn you," but give you advice, yeah. The person you're interviewing with is good, the group you'd be going into is progressive, be a good spot. Or you're going to be going into a dead-end situation, and once you get in you're going to want to transfer into something else. It's invaluable information that you don't get through their college recruiting. (laughs) So again the networking of SWE is such a vital part of it.

TE: How did Hughes react to—or, did Hughes support your involvement in SWE?

SC: Well, they were a little surprised, I think—

TE: (laughs)

SC: —to some degree. (laughs) I mean it wasn't—"The society of what?!"

TE: (laughs)

SC: (laughs) At first, that was the reaction. But Hughes did have—well, Hughes was a major supporter of that 1981 conference. And I got to know a couple of people in the human resources department because that was where the money was coming from, human resources and recruiting. The society has learned—well, probably had already learned that, I certainly learned—to pay attention to what the human resources people need, because that helps with the funding. And that is what drove the change of having our national conference from the end of June, which coincided with the change of officers, to October or very early November,

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which is a much better time for companies to be doing recruiting. As the recruiting became a more important part of the national conference, it became obvious that late June is not a good time for it. Summer jobs are all filled, a lot of other things are all filled, it's just not a good time. So, it was a major change to shift that conference from when it was to what it is now. And we were afraid there'd be a big drop-off in the attendance, but there wasn't. There wasn't and it's grown every year. I haven't heard the numbers for this year, but I hope it's still growing. (laughs)

TE: I believe last year was around six thousand.

SC: Yes. Yes. And at the time, in 1981, I've forgotten just how many we had, but it was the biggest there'd ever been. But that's happened almost every year, that it's been larger than the year before, which is great. And now it's not such a load on the local section. At the time, in '81 and even in '91 when I was co-chair and we did it as a regional thing in San Diego, (laughs) I was trying to coordinate six different sections in the region, and that turned out to maybe not have been such a great idea.

TE: (laughs)

SC: (laughs) At that time, you did everything. I mean, you were allowed to hire somebody to contact companies for the exhibits. But otherwise we did everything else. The registrations went through headquarters, but we made all the arrangements, contacted the hotels and went through figuring out which one or ones were going to work best. At that time we weren't up to the convention

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centers. Putting together the program book, the registration book, arranging all the speakers—all this stuff was done by the local section. And it was a huge amount of work and had gotten bigger every year.

So now that it's handled through a convention management organization, which has been with us long enough to really do a very good job at it. The local host section has a good deal less—it's still busy, and I'm on the host committee this time. In 2005, when we had the conference in Anaheim, I was the chair. But now I'm happy to sit back and let other people take those leadership positions and I will be supportive. Besides, they've got the contacts with companies and whatnot.

And I must say that company support of SWE members in general has grown tremendously. I mean some companies are still much better at it than others, but, like I say, when I started asking for support at Hughes, it was sort of, "What organization is this?" (laughs) And I did pay part of my own way for several years. And I learned to get them to—if I can get human resources to pay the travel expenses, then I can get my department to pay for my time while I was gone and I didn't have to take vacation. And so, there were a few years when I did it entirely at my own expense. My vacation time, my cost. But, most—I would say over half of the time I was working at Hughes they supported it. As I became more active at the regional and national level, I would explain, you know, "I want to help with the recruiting, but I've got this and this and this going on, so I'm only

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available for that amount of time.” And they’d say, “Don’t worry about it Sharon. That’s okay.” (laughs) So that worked out well, too.

TE: So, why has it been important to you to put so much time and energy into SWE?

SC: Mostly because I just love the people. (laughs) It’s just a really wonderful group of people to get to know. You never know where a friendship is going to lead. When we had the conference, the national convention in Puerto Rico in 1988, I think it was, I got to know a young engineer working—I think she may have already been working at Sandia Labs then—from Albuquerque, who was working on putting together a new section for the Albuquerque area, Central New Mexico Section. Jan Williams. Well, she is still one of my very best friends. And we get in contact before each convention, you know, “Can we get together?” And it’s not just her and me, it’s her husband and my husband, and her kids. Actually my kids have never gotten very much involved, but I’ve seen her kids grow up, from small to well past college now for the older one. As it turns out, my husband and Mike are going to go Saturday—they’re both going to be around for a lot of conference activities.

You know, I don’t know if Mike is a member or not—my husband has been a member of SWE since, I think, 1985. And joined us as a senior member because he’d been working as an engineer for some time. It surprises a lot of people to know men can be members of the Society of Women Engineers. Yeah, they just have to support our goals and ideals and that sort of thing, and Neil’s been very supportive, (laughs) all the way through. But Neil and Mike are going to go to the

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UCLA football game. I can't go because I can't go because I've got meetings to go to on Saturday, but Mike can go with him. We have season tickets, we've had season tickets for years and years. (laughs)

So, I've gotten to know so many really wonderful people. As I've worked at different levels I've gotten to know people from other parts of the country. I was region director for two years for the Sonora Region. I've been on several national committees and whatnot. I can only think of one or two people who had kind of prickly personalities and I couldn't really get to know them very well. But most SWE members are just wonderful people to get to know. I think that's a large part of the reason I'm still active in it, even though I've been retired now for ten years.

TE: Well, I think we've gone over an hour. Is there anything else that you would like to add?

SC: Well, just—one thing I didn't mention when we were talking about the career facilitation program at Cal State Northridge. I think that it probably helped that I was there—at that time I was still president of the SWE student section—and I was able to say, "You know, you feel funny coming in being older than a lot of the other students, but you'll get used to it." And you'll find, I think, that a lot of the employers will accept you much more readily than you think they will. Because you've had experience in other things. You've had life experience that makes you actually a better engineer, a better people person, than the nineteen-, twenty year-old graduates, twenty-one. And so don't worry about that part. I found I had no problems. In fact, a lot of people would assume that I had been an engineer

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for much longer than I had. They didn't know I just graduated last year. (laughs)

So, being a mature student is not bad. (laughs)

TE: Well, I would like to thank you for doing this interview—I've enjoyed it. And I guess we will leave it there.

SC: Okay.

END OF INTERVIEW