Bonita J. (Bonnie) Campbell
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Interview conducted by Annie Duval of Viewing Voices for California State University, Northridge oral history project, CSUN Leaders
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ANNIE DUVAL (AD): Today is Friday, March 7, 2018. This is Annie Duval. I am in Granada Hills, California, in the home of Professor Emerita Bonita J. Campbell of the California State University Northridge, Department of Manufacturing Systems Engineering and Management. Dr. Campbell and I are about to begin recording her oral history. This narrative will become part of the CSUN Leadership Oral History Project.

Dr. Campbell achieved many firsts in her career, while paving the way for students, especially women, to follow her into engineering disciplines. She wove together four academic degrees, worked ten years in private industry, and thirty-four years at universities. Her university career included numerous stints in leadership positions, capped by her founding and leading the Department of Manufacturing Systems Engineering and Management. Dr. Campbell began her undergraduate studies in architectural engineering and business administration at the University of Colorado. After three years' study there, she assumed a position in private industry. Dr. Campbell returned to her undergraduate studies at Colorado State University where she received her B.S. in applied mathematics in 1967. She later received her MBA from Pepperdine University, her M.S. in engineering systems from the University of Redlands, both in 1973, and her Ph.D. from UCLA in 1979.

[00:01:48] Dr. Campbell started her thirty-three-year CSUN career in 1975 as assistant professor in the College of Engineering and Computer Science. That same year she created the Women in Science and Engineering Program, also known as WISE. She was the first woman in engineering at CSUN to hold a tenured faculty position, and to serve as a department chair. Dr. Campbell was promoted to professor in 1982, and shortly thereafter appointed department chair. Later, she assumed the position of associate vice-president of Academic Planning and Resources, a newly-created unit, from 1986 to 1991. She then returned to the position of department chair.

Mastering challenges between personal and professional life, including the 1994 Northridge Earthquake, Dr. Campbell maintained continuity in her academic career. She created the Department of Manufacturing Systems Engineering and Management, and was appointed as its first chair in 2001. In this capacity she established five degree programs, gained the first program accreditation and continued her service as chair until retirement in 2008.

During her tenure at CSUN, Dr. Campbell received numerous awards and much recognition, including CSUN Distinguished Teaching Award, and National Society of Women Engineers' Engineering Educator award. Before retiring from CSUN, she created the Bonita J. Campbell Endowment for Women in Science and Engineering. In short, Dr. Campbell was a pioneer in her field. The scope of her career at CSUN spanned assistant professor to full professor, and several significant administrative positions, all the while breaking new ground for women in engineering fields.

[00:04:01] Good afternoon, Dr. Campbell. It is my pleasure to be here with you.

BONITA J. CAMPBELL (BJC): Thank you, Annie. Please call me Bonnie. It'll make life simpler.

AD: Okay, we'll do that. Bonnie, I'd like to start at the beginning, and ask you to talk about your family background.

BJC: My mother was born and raised in a little sod house in western Kansas, on a tiny family farm that my grandparents homesteaded. They never had very much; I suppose you would say they lived pretty much in poverty. And of course by the time the Dust Bowl came along, and the Depression came along, and the thirties, that sort of did it, and they lost the homestead, it was foreclosed on. She had an older brother, about four years older, and the Department of Agriculture in the State of Kansas was looking for people that they could help go to college, to educate, to help the people in that department and service some of the farms around. So he managed to go to college. He thought his sister should go to college, his younger sister, which would have been very unusual in that time and that place, and with no money. So she got a scholarship from 4-H and worked for her room and board. And by that time, her brother had a job with the State Department of Agriculture, and he would give her a little spending money. And so she actually managed to go to Kansas State University in the very late thirties and beginning of the forties, in that manner. And that's where she ended up meeting my father. My father was from Illinois, and his mother had been born and raised on a farm. His father, however, had been raised in town, so to speak—in Peoria, Illinois, with a father who sold brooms and stuff like that, which is what

my great-grandfather did—that's living in town. And so my grandfather, my dad's father, actually ended up as a clerk, railway mail clerk, where you got on the train in the morning with the mail, and you sorted mail all day long and all through the night, and you'd do that for whatever the length of the run was of the train, picking up mail, getting off—and so he'd be gone for several days and come back. And there was a large extended family. My father happened to be the only one in his generation. Lots of aunts and uncles, but no cousins. And so they started pooling money because they wanted my dad to go to college—which none of them, of course, had ever done. And so he went to college and got his degree in engineering, and then was going to work on his master's degree at Kansas State. And of course one of the places that my mother happened to work at the boarding house, cooking meals and serving them, and cleaning up and all that, was the one that my father was at—which is how they met. I guess the plan was that she would graduate and then they would get married, and he would finish his master's degree, and then they would go on and do some other things. But World War II came along right in the middle of my mother's senior year, so instead my dad joined the Navy early in 1942, and they married as soon as she graduated in 1942. So that puts the context of how they happened to get together and what their background was.

AD: Very interesting. I want to go back and just bring up one thing you mentioned right at the start, because it's not something you hear much about, and that is saying that your mother was raised in a sod house. What is a sod house? Can you explain? Is it like a normal house with bedrooms and a kitchen?

BJC: [00:08:43] Well, they aren't very big, and they aren't very fancy. On the Great Plains, there wasn't any wood, because there weren't any trees, you know—just plains with grasses with thick roots and all the rest of it. So what they would do—and this has been used in other places too—they would cut the equivalent of bricks out of the sod. If you can think of somebody sodding your lawn, only make that sod really, really, really thick, with lots of dirt and really deep roots. Most of them were about four inches deep. And so you make these slabs that were usually—the ones I saw were usually about a little over twelve by about four [inches] deep. The walls were thick, about a foot. You'd cut these slabs out of the ground and then you treated those; the roots were holding the soil together. Then you stacked them as though they were bricks, effectively—overlaying, and then you chinked mud and the like in the cracks, and anything else you could find. And you tried to find something to do a roof with. Most of the time a lot of that was old metal pieces or something like that. On the Great Plains, there were a number of those around, but they weren't very big, they weren't very fancy. In my mother's case, it had effectively two rooms. One was where everybody slept, and the other was where you tried to eat and everything. You had a wood-burning stove. That's a sod house.

AD: I imagine your mother being an extremely capable woman growing up.

BJC: Oh yeah.

AD: Very knowledgeable about many different things.

BJC: [00:10:50] Yes, you had to do with whatever you had, and you had to be very inventive to keep things going. She had what I considered an interesting

upbringing. She considered it very deprived, because the food wasn't much, and of course during the Depression and the Dust Bowl, it was terrible because you couldn't hardly go outside. Fortunately they were on the northern fringe of the big Dust Bowl area in Kansas, but still the winds blew all the time, the dirt came down all the time. You couldn't see where you were going half the time. It was not fun.

AD: And where were you born, Bonnie? And what are some reflections on *your* early life, especially let's focus on the years before you were a teenager, your early years.

BJC: Well, like I said, my folks got married shortly after my mother graduated. My dad had already gone into the Navy. He ended up being stationed in Maryland at the Naval Academy. And then ultimately I came along and was born at the Naval Academy, almost at the height of World War II. Actually it was late 1943, and things were kind of tough. So I was born on the East Coast. Then once they hit 1945 and things started calming down a little bit, my dad ended up being a specialist in rocket missile propulsion. That's some of the work he'd been doing when we were in Maryland. And so he got transferred. First we were at China Lake, then we were at Mojave, and he ended up at Port Hueneme on the West Coast. And then we lived a few places there. By the time I became a teenager I had just moved into my ninth home, because we followed the aerospace, rocket, missile industry around.

[00:13:22] I went to public schools. Before I was a teenager, I was in the Oxnard area, and then in Las Cruces, New Mexico, because my dad was then at

White Sands Proving Grounds, which is now called White Sands Missile Range, I think—they changed the title.

AD: Yeah, I was there.

BJC: So that's sort of how—just standard public schools.

AD: Knowing about how your mother was raised, and your father, how did your mom and dad's upbringing, and their respective families, shape your early life?

BJC: Well obviously I learned a lot about being frugal. (laughter)

AD: Yes, I imagine!

BJC: My mother saved every little tiny piece of everything, because you might need it, because that's the way she had been raised when you *did* need it. And my father's family was, of course, not wealthy either, so they did the same thing. So I learned about being frugal. I learned a lot about doing it yourself. They had high expectations that I would do well in school, because they struggled for education both at the high school level, and in particular at the college level, and they weren't going to have me goofing around. You know, I was going to do well. My mother wanted me to do some of the things that she had never had an opportunity to do when she was growing up, and had wanted to do. And I had some what they perceived as talents, so wherever she could find something that was inexpensive and easy, or free, or the like, I ended up with dance lessons and voice lessons and art lessons, and things of that sort to help develop those kinds of skills. And then that really enabled me to take part in a lot of school things with square dance clubs and different school choirs and choruses I guess you'd call them; Brownies, Girl Scouts. She made sure I participated in things like that,

because like she said…. One time I was complaining that I didn't really want to go from Brownies to Girl Scouts, and she said, "Look, if you'd been stuck out on a farm in the middle of nowhere like I had been, *wishing* you could do something, you'd take advantage of that, and have that good experience, so you're going to do it!" "Yes ma'am!" So there was a lot of influence there.

[00:16:16] My dad, of course, was very studious and the like. When we were in New Mexico, in Las Cruces, he actually tutored a lot of students from New Mexico State University in their engineering classes, because a young man, the son of the woman across the street, in this one house we lived in, he was attending NMSU as an engineering student. So I got a lot of exposure to things there, and made some trips out to the campus, and met a lot of people. That was all mainly because my dad was an engineer and happened to live across from this guy who was studying engineering.

AD: Given your dad's engineering focus and his work, who were your friends, and did your friends share your same interests? Like what did you and your friends like doing together?

BJC: A lot of my friends were children of people that my dad worked with, or that were in the same business, and part of that is because the way the—at least at *that* time—the aerospace industry and rocket missile stuff worked: You know, a big program would start up, or a big project, and all of a sudden they'd need people, so they'd move in tons and tons of families—military, civil service, private industry—so there'd be this huge influx. And one of the problems, of course, all the time was housing. You'd move somewhere and there weren't any houses

available to move into, so you had to stop here, and then move to somewhere else, and move to somewhere else. So you were thrown in a lot with this whole huge influx of people, and all these kids had backgrounds somewhat similar to yours in that they were associated with aerospace or the military or some of the private contractors that were working on things. So a lot of my friends came from that group. And so we developed other interests, but we had that kind of thing in common. And of course then there were things that kids in the areas did, like in New Mexico you did a lot of square dancing, square dance clubs, things of that sort. Las Cruces was sort of a small quiet little town, so you made your [own] activities.

[00:18:56] When we were in Las Cruces, I had some interesting opportunities because at the time that we were there, it was a mix of, influx of, people who were working now on new stuff going on at White Sands Missile Proving Grounds, which was expanding significantly. So there was this huge influx of people. There were people coming in from the university, because it was nearing the end of the Korean conflict, and so there were a lot of G.I. people going to school on the G.I. Bill, guys, older ones coming in. So there were *those* groups of people coming in. And then there were several old-line families, many of them were Hispanic families who had been there many, many generations. And so you had this interesting mixture of people. By that time the military, of course, was quite diverse, and you had this interesting mix of people and students and kids to work with and learn from. I learned a lot about Hispanic and Pueblo cultures because, of course, all along the river there, the Rio Grande, up through

the north is where a lot of the Pueblo cultures developed. We had had a time when I was in the third and fourth grades that those of us who did not speak Spanish, several times a week the ones whose native language was not Spanish, went to beginning Spanish classes. The ones whose native language was not English went to English improvement classes. And so about an hour, three times a week or something, we would do that. I still remember a little bit of the Spanish, but it was a different way of looking at things. Interesting experience.

AD: [00:21:13] Bonnie, you said you had just moved into your ninth home when you became a teenager. Where was this?

BJC: I started the eighth grade in Lancaster, California, in, I think it was the fall of 1956. My dad was by then working at Edwards Air Force Base, and I think we were in that house for almost four years, which is probably the longest house I had ever lived in up to that point, and did for a while.

AD: And what about your schooling in Lancaster, how did that flow from all the previous schooling?

BJC: There were a couple of shocks in the eighth grade. (laughter) The New Mexico school systems and the California school systems, at least the two I went to, were on different schedules. In Las Cruces they had had an elementary school that went through grade sixth, and junior high school with grades seven to nine, and then high school grades ten through twelve. So I was in a junior high for my seventh grade. Then when we went to Lancaster, elementary schools went from K through 8, and high school was four years, 9 through 12. And they taught things at a different pace. I ran into, in math, Las Cruces was effectively a year

ahead of where my California school was. So I went into the eighth grade and we went for math sessions, and I was kind of like bored, and I'd already been there. On the other hand, you turn it around and went to English class, I was supposed to pick up and do an assignment, and one of the parts of the assignment was to diagram sentences. Well I'd never had sentence diagramming.

AD: [00:23:25] Oh gosh, yeah.

BJC: In Las Cruces they did that in the eighth grade. In Lancaster they did it in the seventh grade, so you had these gaps, so you had to scramble around to catch up. So all of a sudden I'm going in circles, trying to catch up on one thing, while being bored to tears in another thing, and feeling like I was losing time. Plus there's a cultural difference between going to a junior high school, grades 7-8-9, kids that age, and going to a school that's K-8, which has all the little bitty kids there too, and you're trying to work around *them*. That was interesting.

AD: So hopefully you got your bearings in Lancaster.

BJC: Yeah, I totally got them.

AD: What did you focus in on school?

BJC: Well by the time I hit the ninth grade, high school—which I thought was really quite good—at least it was a good school for me, and good subjects. At that time, of course, they tracked students, and some people were into college prep, and some were tracked differently. They do things differently now. But I was tracked into the college prep courses. When I hit my trigonometry course fairly early on, that's when I really fell in love with math, and enjoyed math tremendously. And then I also enjoyed my physics class, because I had to take two science classes for

part of the college prep, and one of them that I took was physics, and I really enjoyed that, and I was pretty good at it, you know. And so by that time I was developing a fairly strong interest in physical sciences and mathematics.

AD: [00:25:29] Did you find those early interests in math and physics set you apart from the other girls? Did you see yourself as kind of a "geek" as they'd say now? Did you have other girls that enjoyed some of the same stuff? What were your classes like?

BJC: Well there were some girls in those classes—not a lot of them. Most of them made different [choices]. You know, you didn't have to take trig, and you didn't have to be preparing for calculus, and you didn't have to take physics, you could take some other science classes and be prepared. So there were some girls in the classes, but if you think about it a minute, we're in the late 1950s when I'm in high school there—'57 and so forth—and at that time, the general social climate was that girls weren't supposed to be interested in things like math and science, and particularly physical science—maybe a little bit of biology, because that was looked at as more feminine. But they weren't supposed to have interests in those areas. And they also weren't supposed to be any good at them—you know, the prevailing attitude was, well, girls aren't as good at math as boys are, blah, blah, blah. And you weren't even really supposed to make good grades in whatever you did, because otherwise you might look like you're smarter than the guys, and oh dear, that would be terrible, it'd ruin your social life. So what you did was, you tried not to let it be known that that's what you were taking, and what your grades were. (laughter)

AD: [00:27:23] You personally actually tried to be a little more downplaying?

BJC: Oh yes. Oh yeah. The few women I knew who had anything kind of in common like that, you downplayed, you didn't share anything about grades, and you downplayed which courses you took.

AD: Yeah, with your girlfriends.

BJC: I didn't question a lot about that, in many respects, because that's the way it was, until I had what I called my Sputnik moment, or my Sputnik awakening, because when the Russians launched Sputnik, the first satellite, of course the U.S. went into a frenzy, and we've got to do this, we've got to do that, we've got to catch up in math and science, we have to educate all our people in math and science, we need more engineers, blah, blah, blah, blah, blah, you've got to encourage your students to do this, that, and the other thing. And so I'm listening to this in a positive sense, but at the same time—I don't know if they still do this, but they used to give vocational testing to the students in the high school. You know, what do you like, what are you good at, what do you do, does this interest [you]? I guess they did some sort of psychological profiling and interests profiling. But unbeknownst to me at the time, they had two different scales that they used to evaluate what you might be suited for. One was for girls and one was for boys. So here they wanted everybody to be good in math and science, and I'm thinking, "I'm good at math, I like math, and I ended up pretty good at physics." So I get my results and the highest recommendation is that I should be an administrative secretary because I would be well organized, and I could do it. And since I sort of liked math and physics, I could work in that kind of an environment because I

wouldn't be intimidated by it. I still remember that, and I thought, "This doesn't make any sense."

AD: Yeah.

BJC: You want these students, and you're getting us all hepped up to do math and science and the like, and at the same time you're saying, "No, you can't do that career, you've got to be helping someone else do theirs."

AD: How did you counter that? Or was that just their advice and you were like, "Okay."

BJC: I sort of wasn't…. What are you going to argue about? You know, you just say, "Okay." But it perplexed me, and it always put a little bit of insecurity or concern about, "Am I doing the right thing?" But I became quite sensitized at that time that there were some real meaningful differences somewhere, and I wasn't quite sure what they were. But I was only like fourteen, fifteen years old.

AD: You were beginning to notice that you were, in fact, different.

BJC: Yeah.

AD: Did you continue with any other interests, or develop new ones as you moved to California?

BJC: Yeah, when I was in Lancaster, in particular, I went ahead and I continued with my piano lessons. I'd been taking piano lessons since I was five or six; I guess it was five. I was pretty good at it, and took on organ lessons. I accompanied people in the band with their solos, and was in a girls' chorus and a girls' trio, joined the square dance club, and then was picked for one of the high school sororities, and took summer lessons. My mother always made sure we tried to get

into summer lessons at the "Y" for swimming or tennis and stuff like that, and some art classes. So I continued with all of those kinds of things during that time period. But then that all kind of came to an abrupt halt after I finished my junior year in high school. And that's because my dad moved again, which meant *I* moved again. And I wasn't happy about moving right at the end of my junior year of high school, because it was leaving things all behind. And so we ended up in Colorado, and I did my senior year of high school in Littleton, Colorado. Once again—you talked about how studies fit together—once again there was some disruption in my studies. I don't know what the reasoning all behind this was, but the public school in Littleton, Colorado, did not think very highly of schools in California and what they taught their students.

AD: I'm not surprised.

BJC: I had been all geared up to take calculus my senior year, and they didn't want to let me in the class because they figured I didn't have good enough preparation. They thought that coming from such a poor academic environment—I'll never forget this—poor academic environment—I should take a study hall. And I thought, a *study hall?!* I'd never had anything like a study hall before in my life. I had been in advanced English, and they thought I'd better take the regular English class because I wouldn't be prepared. So it took my dad to go down to the school and talk to the, I guess she was called the girls' counselor. I remember her name, but I won't repeat it. He had to talk to her at length, and finally convinced her that I should at least be allowed to try the calculus class. If it looked like I wasn't going to succeed, they could move me out, and surely I could

take a mechanical drawing class instead of a study hall, because I was good at studying. So we made it that far. And then after about three weeks, my English instructor, after doing assignments, *she* was the one that made the move to move me out of that class into the honors advanced English class. She said I was too far ahead of all the rest of the students. And so I ended up with the courses I needed and wanted and all the rest of it, but it was a little bit rough getting started up, and I wasn't very happy about it. I wasn't very happy about going to Colorado in the first place, and I certainly wasn't very happy about my reception at the school. And all of my other activities just dropped, and I never really went back to them.

AD: So in what other ways did your many moves affect you?

BJC: Well, like I said, I never went back to most of my other activities. It's difficult to start and stop, and start and stop, and start and stop, and start and stop, and then forever be packing and moving. Even if you're sort of in the same area or town, you're changing a school, or you're getting a new address, or you don't know where anything is, and you don't know any people that are around you. It's hard to have continuity, and some people take to it okay, and some people don't take to it very well. I didn't take to it very well, not having the continuity. It bothered me to always be leaving, leaving, leaving—leaving things behind. And I think that probably influenced some of my later decisions. I thought, well, if I have my own job…. Little did I know about employers making decisions for you at that time, really. But if I had my own job and my own career, I wouldn't have to just move around at the whim of somebody else. That was part of my thinking. So I guess it helped put me in that kind of a career mindset, but also put me in an

attitude set of holding back from a lot of social stuff, because why bother, you're just going to leave it again, so limit that.

AD: [00:36:40] Uh-huh. After finishing high school, then, where did you go to college, and how did you make that decision on what college to go to?

BJC: Well, I went to the University of Colorado at Boulder. Part of that was it was in state. Despite all the trouble I had getting started in high school, I got a scholarship to go there. And I had narrowed down when I was applying that I wanted to major in either math or engineering, and I finally ended up actually narrowing my application to the engineering school because Boulder was one of the universities that accepted women in engineering majors. There were still a lot of them that would not admit women into engineering majors. This is back at the very beginning of the 1960s; places like our own Cal Tech over in Pasadena, that didn't admit undergraduate women into their engineering programs until the early to mid-1970s. So there were *some* opportunities you didn't have, because they simply didn't admit women into the engineering school. But Boulder did, and so I got in there, and I picked my specific major (chuckles) for two really dumb reasons, I guess. Well, one of them's not so dumb, but the other one is, I guess. One was that I picked architectural engineering because there was a mix between hardcore engineering work and what I call aesthetics and arts in terms of you had to take a lot of the architecture courses in design and projections, and then figure out how that design could work together with whatever engineering heating system you were designing or something like that. That was the challenge. So that appealed to me because it had that mixture. And the other reason in the back

of my head was that I hadn't particularly cared for high school chemistry class, and this was an engineering major where you didn't have to take more chemistry! (laughter) So I could take more physics, but I didn't have to take any more chemistry. So those were kind of strange reasons. It was an interesting experience. I'm not sure I was completely psychologically or emotionally prepared, if you want, for what you'd call the heavy male environment. I mean I had grown accustomed to classes where most classes in physics and math and the like, there were maybe two girls and twenty-five or thirty guys. But I hadn't been quite prepared, I don't think, to be in an environment where you had a College of Engineering and Applied Science, and except for just a couple of females, it was an *all*-male environment, and the only class I was ever scheduled to take that had any women in it was the girls' physical education class, one semester, that the State of Colorado required in undergraduate majors. Even the English Department was Engineering English—you know, physics, Engineering Physics. It was all in that one college. So I think I might not have been prepared for that well enough, and I began to question what I was doing, and that's one of the reasons after being there for about three years, I thought, "I'm going to at least go work for a while, and then I'll get my act together and go back." And just like many best-laid plans (laughs) that went haywire. I did start working, but I also ended up in that period getting married, having a child, changing schools, not paying enough attention to the fact that they didn't have the same major at Colorado State University at Fort Collins that they did at the University of Colorado at Boulder, and so I couldn't switch easily, but what I could do is build

a reasonable degree program in applied math, without having to take too many studies. And so I was doing that, and then the marriage fell apart, and so my folks helped me and I finished, and I finally graduated with a Bachelor of Science in applied mathematics, and then went back [to work]. I'd been working part-time in industry all the time, but I went back to full-time industry work there in Denver. So it was kind of crazy.

[00:42:32] I mentioned earlier that I got a bit sensitized when I was at Boulder, because of the all-male environment. And there's a couple of funny stories about that I guess I should share. One was…. This was when I first became aware of the restrooms issue. Women's restrooms: buildings built in earlier years for engineering students to use for classes and for instructors to use, and all the rest of it, were not built with the idea that there would be faculty or students who were female, which meant finding a women's restroom that you could use sometimes was quite a challenge! Sometimes it meant you had to go running over to a different building; sometimes it meant you had to go down and share something at the dean's office; those kinds of things. Then having sort of overt comments, like going into my Statics class, and I was heading towards the back of the room the first day, so I could sort of hide away. It was a big class, must have had sixty to seventy people in it, all guys. And as I'm walking down the side of the aisle to get to the back row, I hear the instructor say, "Well, there go all the good jokes for the term," meaning obviously he liked to tell risqué stories, and now he felt he couldn't. So that was a different experience. I think the last one, one of the ones that blew me out—in fact, the semester I decided I

needed to take a break—was I was taking a Surveying class, and so they'd break us up in crews, and we'd go out, and we were supposed to survey certain things on the campus. And of course those were the days of girls-only dorms and boys-only dorms, except most of the boys could live in apartments and the like. So what the guys wanted to do was run around, and they'd pick the tracks that went around the girls' dorms, so then they could train their transits on the windows of the girls' dorms, and see if the draperies were open or anything, and they could see anything, like a female changing clothes or whatever. I thought, "Man, I've got better things….! I have to *live* in one of those things. I've got better things to do than looking through the windows at women changing clothes!" So some of those things made me very different (laughs) … turned me around … it was crazy times, you know. I look back on it now and I kind of laugh, but it was sort of confusing. You know, you were jerked one way, and then jerked the other.

[00:46:16] Having finally gotten a bachelor's degree in hand, I then decided I wanted to look for a different position. I'd been working in the engineering surveying industry, and I wanted to look for a different position, and I wanted to leave Colorado. I wasn't happy with the weather. I wasn't happy driving home in blizzards, so I started applying for jobs in Southern California because I had some family out here, and had lived out here, and ended up accepting a position as an industrial engineer with the Kaiser Steel Corporation. That was back when it had the only fully integrated steel manufacturing facility in the western United States, out in Fontana, California. That's been all gone since the mid-1980s, but it was a fascinating place. Marvelous projects, a real learning

experience. I was able to put together my different backgrounds in engineering, my writing skills, the computing skills and programming skills I was developing—because that was relatively new—working together with people on teams. The projects were fascinating, and of course the mill was fascinating. I fell in love with the steel mill. It was so huge, just monstrous huge. The rule of thumb was who gets the right-of-way, you know—whoever's biggest. And so (laughs) when you'd see these big straddling cranes carrying these big steel slabs of tons, you get out of the way really fast, whether you're on the road or not—you're the one that's supposed to leave.

[00:48:02] I hadn't realized at the time, but I was the first woman that they hired in their engineering organization there. So most of the other women who worked in the plant were clerical people. There was one woman who still operated an overhead traveling crane out in one of the Basic Oxygen Shop, which she had hired on during World War II when they would hire women for that, but for the most part there weren't any, and there certainly weren't any in the engineering organization. Of course here again, you ran into my favorite restrooms issue (chuckles) because throughout the mill there *weren't* any women's restrooms unless you went to the field administration building. So you learned early on to plan, and drive out to the blast furnace or something, and to plan ahead that you were going to be out at the blast furnace for a while, because you were going to have to drive all the way back to the field admin building if you wanted to go to the restroom. And in fact, one of the guys who was in charge of the Open Hearth, the superintendent there, wouldn't even let me *in* his facility.

He was the only one that was a real hardnose while I was there, because he said I was a safety hazard, I'd distract the men from their work. "And besides," he said, "there aren't any doors on the johns." I thought, "Well, you could always put doors on."

But during that time I did a lot of reading, and I was actually doing a couple of master's degrees, and so I was doing a lot of reading, and read Caroline Bird's book, *Born Female*, so I began to gain a better, broader perspective on women, and women in the workforce, and particularly women in the men's world.

AD: [00:50:12] Were there any engineering organizations at that time that you belonged to, or was this still a time when you were sort of making it on your own?

BJC: I had joined the Society of Women Engineers when I was at Boulder, and I've continued my membership since then—the problem being that there weren't little chapters all over the place, because there weren't very many women; although there was a chapter in L.A., it was small. So you had to go from Fontana into downtown L.A. effectively—actually a little further than that—to where they would meet at somebody's house, and there'd be a small gathering. I tried to go to a couple of those meetings—actually, I *did* go to a couple of those meetings—but it wasn't in the cards to be driving back and forth all the time. But of course they had newsletters and magazines and so I kept abreast of what was going on with women in engineering from that time, from early on.

AD: [00:51:48] Uh-huh. You said while you were at Kaiser you were also getting your master's degrees. Did you have any work colleagues or professors or other

mentors who helped guide your education and career path? How did you determine which way to go?

BJC: Yeah. Kaiser fortunately had a very good tuition reimbursement program, and so I did two night programs. One was in engineering, and that was at the University of Redlands, which meant I drove one direction after work, usually one night a week; and the other one was an MBA with Pepperdine University, and they were running what they called programs at off-campus sites. And so they had a site out near Fontana, and in fact the first classes I was in were heavily drawn from men who worked at Kaiser Steel. In fact, all my classes for the engineering master's and the MBA were all guys, except me. So I was doing that while I was working at Kaiser, and I met one of my faculty members in the MBA program, a gentleman by the name of Harvey Adelman—very bright, capable guy. He'd been with Rand for many years. And he started encouraging me when I was in one of [his] classes. "When you finish all this stuff up, maybe you should think about getting a Ph.D." Well, I never thought of anything like that. And so I kind of went ahead, and we kept in touch while I was finishing more classes. I decided to leave Kaiser and then accepted a job with General Electric Information Systems, which turned out not to be such a good match. Harvey's telling me at that time, "Well, why don't you go ahead and apply to UCLA and see if you can get in their Ph.D. program, and you could probably pick up some teaching and some stuff at Pepperdine and other places." So that's what I did. So for the next couple of years at any rate, he really encouraged me, and I would have never thought of that. In fact, I ended up with an assistant professor position at

Pepperdine University, teaching for their School of Business and Management in one of their undergraduate programs at night, so I could take classes during the day at UCLA. And then I also consulted in some engineering companies there during the day, and slowly stumbled through the next couple of years that way.

AD: [00:54:39] Uh-huh. And how did you happen to come to CSUN?

BJC: I was actually recruited by a senior tenured engineering faculty member, a lovely gentleman by the name of Virgil Metzler, who was interested in broadening perspectives of faculty. He was sort of thinking ahead of his time, in many respects. And he had somehow gotten my name from the Society of Women Engineers, and invited me, made arrangements for me to meet with some folks on the campus, and try teaching a part-time class, which I did. And then they invited me to apply for a tenure-track position that was opening up in the fall of 1975, which I did. The hiring process was much more flexible, and the college was much smaller, and it was much different then. I applied and was accepted. And then that surprised me when I realized fully that I was the first female that was ever hired in a tenure-track position in any of the engineering programs or departments in the college. So there I was again, sticking out like a sore thumb, so to speak. I'm sure a lot of this was facilitated by things that were happening in government, like the 1972 Equal Employment Opportunity Act, where they were putting pressure on different organizations, including universities, to be more diverse racially and gender-wise, and so I'm sure a lot of that was in the background there. So it was a great start.

It was a very unorthodox career during my years at CSUN, I guess. I didn't just go zipping along and doing my research and teaching and the like. I kind of bounced around from one thing to another.

AD: [00:56:57] Uh-huh. And what would you consider that first part of your career? Let's call it Phase 1.

BJC: Yeah, in my mind, I break my CSUN years, which were many, into sort of four phases, because I was occupied differently during those phases. The first phase was actually about the first ten years I was there. And that's when I was progressing through the ranks from assistant professor, to associate, to full, and getting tenure in the process; and then actually becoming chair of my department, which was sort of surprising. And again, I was the first female who chaired an engineering department. I started the whole thing on Women in Science and Engineering, that I worked on for many years. I was very active in faculty governance and professional organizations, and I also had an opportunity after I'd been there a couple of years, to have a part-time position down at the Aerospace Corporation, which is in El Segundo, which was really a positive to both my life and to what I could do with my students, and all the rest. It was a great augmentation.

AD: Well, considering now that you're still a woman amongst more males than females, where did you find support at CSUN, and in your career path here? Were there other women?

BJC: [00:58:47] The interesting thing…. The challenges were sort of like my first office being next door to the men's room on the third floor, and there being no

women's restroom on the third floor. I mean, you know, things like that. Some of the students [looked] askance at a female, full-time faculty member doing things and starting women's activities—one of whom later became a graduate student of mine, and now is a very good friend—but at the time he was…. And some of the faculty were not very welcoming. But there was a small group, at the beginning, of women who were already on campus in different fields and different disciplines, who were already tenured. And they were starting to say, "Hey, you guys have been running this place long enough. We want to do things, and we want to get more women into faculty governance, and we want to do all these things." Two of the earliest ones that helped me were Mary McEdwards, who was in the Speech Communications Department, and Margaret Vernallis who was tenured in the Counseling Department, and then there was Jane Bayes in Political Science a bit later on—some folks like that. They started gathering and getting the women to act *together*. The group grew over the years, and then they sort of, after things became a little bit more stabilized, it quieted down, like such things do. Nickname was … [we] called them "wonder women." Some of the guys on campus I guess called us "the female mafia." But they were marvelous. It was a blessing. I don't know how I would have survived, in a way, because they were the ones that were really willing to really tell me how to run the ropes. There were a couple of guys in the Engineering College who were helpful, but they couldn't reach into others [departments]. They weren't in my department, and they couldn't reach down into another department's business. And so it was a little bit challenging, but some of the faculty did not like the idea of [me] running

the Women in Science and Engineering at all. They thought it was a distraction from what I should be doing. But the gals, the women, were fantastic.

AD: [01:01:42] Uh-huh. Well, that's good, that you had that.

BJC: Yeah.

AD: Maybe you can talk a little bit about WISE, the Women in Science and Engineering.

BJC: When I was interviewing for the position, one of the questions was how did I feel about advising women students, and maybe encouraging more of them to come to major in engineering. I said "Not only would I *love* to do that, I think it *should* be done; I'd really like to jump in and *do* it." Which I did! I may have been a little *over*-enthusiastic for the place. You know, at that time there weren't really any programs at most universities to recruit women. I mean some of them still weren't admitting women into their engineering programs, let alone recruiting them actively. And universities hadn't gotten to the point where they were organized to say, "Oh, we've got to do something to change our gender mix!" So all of this was kind of new. So I just sort of jumped in. I couldn't even find any literature that I could hand out or send to people, so I created a brochure from scratch—even typed it! That's the way things were done in those days. For women, and giving status reports on women in the different science areas and engineering areas, and having photos of women who worked in those areas, and then the university was willing to pay to get it printed up on plain paper. It was just simple, but it worked, and we could mail it out. We even had other colleges pretty soon, purchasing them from us, because there *wasn't* anything.

And then I was assigned a small lab space—little tiny lab area that hadn't been used as a lab for quite a while. I mean, it wasn't much bigger than this small dining room here. I created out of that, well, we'll call this a Center for Women in Science and Engineering, and cleaned it up, got a table in there. It was someplace where you could start saying, "Go to the WISE Room." So I put together this brochure, created a student organization. I probably would have created a student chapter of Society of Women Engineers first, but at that time there weren't enough women that I could put together from engineering and physics and math majors on campus to qualify for a chapter. So I put together a group that we called Women in Science and Engineering, and then just invited all the women students from across campus in those majors. We had people from biology and chemistry and you name it—math—in the student group. And then later on, of course, we also created a Society of Women Engineers chapter, and since then other programs on campus have developed their female enrollment enough that they could develop things like a Women in Chemistry group, and some stuff like that. So we did that, and then lots of recruitment activities. I don't know how many high schools, community colleges, other universities, community groups, church groups—I went to anybody that would have me there. I went and gave them a blurb on opportunities for women majoring in engineering and sciences, and why going to CSUN to do it was a good thing. And it just went on, and on, and on, and on. I sort of wore myself out. But it made a difference, and some more came. And then I tried to put together workshops, and we had workshops on campus and invited high school women, community women. The

very, very first one didn't work out very well, because I didn't advertise it far enough in advance, and I didn't know how to do it. But I learned! And so the second one we tried, I tried a bigger venue, and it was wonderful. The place, the big Speech/Drama Theater at the time was packed to the gills with women: young ones, older ones, all interested in the campus. Faculty and women in other professional organizations and groups would come through to set up panels: here's a panel on careers in biological sciences; here's on the physical sciences. You know, it went on. It was fantastic! And so I did those for *several* years, and then also set up the Career Facilitation Project, which was directed towards women who had gotten degrees in some area of science or a related area, who were either *under*employed or *un*employed because they were older and wanted to get back into the field, wanted to get back into something like engineering. So we'd give them an internship in private industry combined with classes to cover the things they would need for their Engineering-in-Training exam on campus, and then they'd get a certificate program. And we ran that project several times. And of course all this stuff is being put together by going out and raising money from industry, writing grant proposals. I had a lot of grants funded by the National Science Foundation, FIPSE (Fund for the Improvement of Post-Secondary Education), things like that. And that went on through that whole period, but it was quite an endeavor, and I thought it was worthwhile, made a difference. I think it made a difference, and it made a difference in the short term, and it's made a difference in the longer term—not as much as I'd hoped, but it did.

AD: [01:08:48] That's marvelous. Speaking of private industry and your WISE program, you're now a professor, and how did your industry experience impact your teaching and student learning? And also, how did you keep current with technology?

BJC: Well of course I had a wealth of real-life examples to draw from. I mean, not only had I taken a surveying class, I had *worked* for a surveying and engineering firm. I knew a lot about it from how it worked, from one way up, and down the other. And I had done a *tremendous* number of projects that were *directly* applicable to the engineering classes that I was teaching in industrial engineering, in particular, while I was at Kaiser Steel. But it also fit into others, like evaluating the economic value of different projects, and trying to figure out which alternatives to select. All of those things became important. And then after I'd been at CSUN for a couple of years, that's when I had the opportunity to be part-time with the Aerospace Corporation, which is a federally-funded research development organization—mainly supports the United States Air Force and its different programs. And they were doing things, and I could work on projects there that were not only useful in the teaching, but that were very relevant to what my Ph.D. field was in time series analysis. And in fact they had better resources than the campus did. I mean, they had more money, effectively, and space, and access to computing, access to interesting projects, I could talk to colleagues who were working in the same field I was working in, and work *with* them. One of them, Dr. Howard Holtz—he and I were still co-authoring published papers up until the early nineties. So the mixture of that is how I both kept current, and had

things to bring into the classroom that were real. You know, they weren't out of a textbook, they were real, and sometimes they were happening in real time!

AD: [01:11:41] Yeah, I understand. Wow. Sidestepping just a bit, you mentioned faculty governance. Can you tell me about your faculty governance experiences?

BJC: Getting involved in faculty governance and committed to it during my … what I call my first phase, and early on in the first phase, was probably one of the more important things I ever did. Not only did I learn a lot about how the institution works as a whole, I learned how to appreciate the institution in the broad sense, rather than just sitting in my little corner. I met some fantastic people and faculty and administrators and colleagues, all the rest across the campus. I served on a number of the campus level—what they called campus-wide—faculty committees, where they had representation from the various colleges. I think the ones I had the most fun with at that time were graduate studies, and research and grants committees. Then I actually ended up going on to become the vice-president of the CSUN faculty body, and was also for a few years elected as one of the campus senators on the statewide academic senate, which was an academic senate consisting of, representing all of the faculty on all of the campuses throughout the entire California State University System. And that was a *great* learning experience, because I learned how things worked at the system level, much better; why they worked that way. Most interesting to me always was the economics of how things did or didn't work (laughter)—which turned out to be advantageous to have known about in the relatively near future! But that was very important. I know a lot of faculty sort of pooh-poohed the notion of

"wasting" time on faculty governance—they should be doing research—but from my perspective, that's one of the key things you can do if you want to understand your environment and learn how to move in it, and contribute to the institution as a whole. I realize a lot of people don't have that interest, but I did; I was more broad.

[01:14:26] I mentioned that the statewide academic senate was of particular value because I learned a lot about the resources, and it proved its value to me personally rather quickly because it precipitated in part, and facilitated my move into what I consider my second phase of the career at CSUN. And this brings us up to about 1986 or so, '85-'86, and we had a new vice-president of academic affairs, and he wanted to create a new organization with them, which had an associate vice-president for academic planning and resources. And I was encouraged to apply for that position. And one of the reasons I was qualified was because I had learned so much about how the resource issue and the funding issue was really supposed to work, because they had all these formulas, and it wasn't a standard budget package at all, and you had to worry about how the formulas worked, and which formulas. And so I applied. I ended up being appointed to the position. I'll never forget, I was still department chair at the time, and I had gone back to visit my parents over the break between fall and spring, and I got a call while I was at my parents', making the final offer, which I accepted. And then the next thing I learned was that we had a very, very, very, very major midyear budget cut (laughs) I would have to deal with when I got back from Colorado. I thought, "Okay." That's called jumping into hot water from the start. But it was

a new organization. It wasn't like you're going into a position with a huge staff that everybody knows what they're doing and the like. Everything was new. You had to figure out what was going to be in the organization, who, how it was going to be handled. There were a few people who had been put temporarily into positions. The portfolio responsibilities for that position were quite large. It included the academic budget management for all of academic affairs, which is by far the largest part of the institution; all of the space planning and management associated with academic affairs, so all of a sudden you're responsible for what's happening in classrooms and laboratories, and how many faculty offices there are, and then talking to the facilities planning people who actually have to build or take care of, or whatever, those things; academic computing; institutional research; different things with budget negotiations; executive secretary for standing committees; sitting on millions of other committees; trouble-shooting units that had budget problems. I mean all those things fell into that portfolio. So I was walking into this position and I didn't even have an *assistant* to work with. (laughter) There was a wonderful woman there who was serving sort of in an interim position as the academic budget *manager,* but, … at least as a department chair I had somebody who could help me with typing memos and distributing them. I didn't even have *that!* So we had to build the organization, in other words; figure out what functions the people should perform; which ones weren't being performed properly; and at the same time be dealing with the real problems. So it was a challenge, and some of those are…. I mean, you know, institutional research is a *huge* organization right now, compared to…. We had one person

and a student assistant starting out, for the whole institutional research operation, so it's changed quite a bit. That was an interesting period, interesting position.

AD: [01:18:55] So what were your career plans after leaving the AVP position?

BJC: Some of my experiences, some of the challenges that I had faced while AVP, particularly tiptoeing around the politics of the senior executive group and things like that, it had gotten kind of wearing, and I had come to the conclusion that I didn't really want to stay in central administration, and I didn't really want to go further, and so after about five years I said, "I think I ought to be leaving this position and retreating," since I had retreat rights back to my faculty position, go back to my faculty position. At the same time, I had started dating a colleague, after many, many years on my own, and we had decided to get married. And so between the two I thought, "I'm going to leave this position and go back" and enter what I wanted to be my final phase, but ended up being the third phase, of just sort of an ordinary faculty member—you teach classes, you don't try to…. You know, do *some* faculty governance, you do a bunch of research. I had a lot of stuff lined up that I could do research on. You didn't take on all these other roles. And advise a lot of students, because I always loved working with the students. So that was what my plans sort of were. They didn't turn out quite that way. (laughter) It started out the first thing that happened when I left the AVP position, was that the department chair in my department left, and they wanted me to come back and chair the department again. So all of a sudden there I was, back in a department chair position, with all those kinds of things going on. I had scheduled a research sabbatical, in the spring of '94, naturally, and that all went

haywire. So within a very short period of time, the plans for that time period got turned upside down a little bit.

[01:21:41] One of the key reasons that my third phase of [my CSUN] life didn't turn out the way I had expected it might be was I mentioned I had a research sabbatical planned for spring 1994. And of course in January of 1994 we had the wonderful, marvelous, Northridge Earthquake. One outcome of that, of course, was my home was close to the campus, and just like the campus, there was a lot of damage, and so I had to deal with that. And part of the damage was the demolition of my computer and my hard drive, without sufficient backup on things; and papers that got water all over them. Anyway, by the time all was said and done, and I had culled through that mess, which took a long time, it not only ate up a lot of the time that was supposed to be research sabbatical, putting it together, but it destroyed enough of the data and information that it was going to be next to impossible to put it all back together—which was really frustrating, because I'd collected it, and collected more while I was AVP, with the notion that now I'd be able to finally do something with all of that.

AD: [01:23:12] What was the data focused on?

BJC: Oh, it was all focused on dealing with women in science and engineering –mainly engineering. And I had collected statistics…. See, this is before you got, you know, things floating around all over the worldwide web for you, and access the stuff. You've still got mounds of paper you're trying to compile from different sources, and you have to request them. If you're doing interviews, you can't just find things online, you have to handle it otherwise. So it'd been many years of

collecting that, and I was trying to put together better pictures of women's success, doing some long-term follow-up on some of the women who had been in our programs earlier on at CSUN, because I had all the rosters of names, and a lot of them I still had kept track of addresses with, and "where have you been, what have you been doing, have you had success?" So that was what I was really going to do, was finally bring that to fruition. Well, that got terribly—terribly, terribly—goofed up. So we had *that* going on at home, and of course I had to do something about repairing the house and all.

And of course the campus was a mess, and the engineering area we were both more lucky and less lucky than some of the other parts of the campus. The more lucky part was that an addition was in the process of being built to add to the old building. And fortunately, after several months, they determined that that would be safe to occupy. They finished the addition, said it was safe to finish it, safe to occupy, and so by fall '94, they were able to cram a bunch of stuff from engineering into that addition. They were still working and trying to do things in the *old* building, however. So we had trailers and stuff like that—and our old building didn't collapse. It was damaged, but nothing…. I mean, it wasn't like what happened to the poor School of Arts, or the science labs and stuff like that, or the parking structure, where things were just devastated.

AD: [01:25:51] So after the earthquake were the students actually able to study then back in the school, or they were dislocated to trailers? What was the situation then?

BJC: We had classes that we recovered some of the equipment…. Well, some labs and stuff that we would normally have run were simply cancelled, because they wouldn't let you in the building to access the equipment anyway. You couldn't access your faculty office. You couldn't do *anything* for the longest time. And so you had to make do with what you had, so you couldn't hardly do hardcore laboratory experiments without access to the equipment, and you didn't know what shape it was in. Even once they decided you could enter there, that didn't mean you could *teach* there—you had to try to move what equipment you could, to a trailer or something. And a lot of the equipment was not of the size or the installation that you were going to move it *anywhere* at all, let alone to a trailer! So you had to work around that. Some of the engineering materials labs, like for the undergraduate level, I don't know how many times over the years then we ended up moving equipment from that lab from one place to the other as one thing was fixed, and something else was fixed, and something else. So we taught in trailers.

[01:27:18] I was supposed to be on sabbatical, so I didn't have any classes, per se, scheduled, but all of a sudden we had these students who needed classes to graduate, but they didn't have the facilities, and they didn't have any way to do things. So I took one small class and actually ended up teaching them. We met weekly in my home, and I just took over so that they would have something. And then I went ahead and advised students—since I couldn't do my research or leave or anything anyway—and advised students as best I could from home, and did some guest lectures for other faculty, including in other disciplines,

so that they could kind of help keep moving things along. For a long time afterwards, you didn't know where anything was on campus, or how to get there, and they kept moving things around, and you moved around. (laughter) And the *moving!* Oh! Moving laboratories, moving back, moving forward, changing locks. You get to the office or get to the lab, and the key doesn't work because somebody's changed all the locks again. It was a level of chaos. I don't know how the central administration (laughs) managed to function with that, and how some of the faculty did who had some really, really difficult laboratory situations to deal with. It was an experience.

AD: [01:28:51] Were there other things that transpired during this period that may have impacted CSUN and the rebuilding of the school and the coming back together of the normal functioning?

BJC: One of the things that happened that I think is important in terms of the development of the College of Engineering and Computer Science was that as we were working through restructuring laboratories and access to things and all the rest of it, we actually started working towards restructuring the engineering programs. And CSUN had had what they called a single Bachelor of Science degree in Engineering, an interdisciplinary program. The world had long since moved beyond single interdisciplinary programs with little clusters of courses. In fact, the students who specialized in civil engineering had a devil of a time getting their professional registration, because registration requirements said "must have a Bachelor of Science in Civil Engineering." And we had played with things like having defined options, but that got into another mess with accreditation. So for a

couple of years there, we focused a lot of our attention—and I was heavily involved in this—on sorting out the engineering program, both the undergraduate and the graduate, so that we had separate degrees, because we had a Bachelor of Science in Mechanical Engineering; Bachelor of Science in Civil Engineering, etc., etc., etc., etc.—instead of this general degree—and did the same thing at the Master's degree. And of course not only was there lots of politics, but you had to sort out all the curricula. You had to get approval from the departments, the college, the university, the chancellor's office, work it through. So that was a *major*, major undertaking, and I pushed hard for that. I thought that was where we should go, and some of the other faculty did too. A lot of them didn't like it, but we managed to make it, and it brought us in alignment; it brought the College of Engineering and Computer Science in terms of its programs and academic program structures, into alignment with 99 percent of the rest of the world. At the same time, I did something on campus that I had wanted to do previously, was to introduce a course on women in science and engineering. And so I wrote the proposals, got it through the process, and entered it, and as far as I know, when I last checked, it was still being taught as an upper division general education course, so that people across the institution, all undergraduates, could have exposure to what women were doing, or could do, and the like, in the fields of science and engineering.

[01:32:24] And let's see, what else? Oh! something completely in parallel during that period, but sort of off to the side, which led to another research project later on. My husband was a collector of things, and early on one of the things he

collected was Depression Glass. One of our colleagues, Louise Lewis, was the Director of the art galleries, and she was ahead of the curve in terms of broadening the perspective of what kinds of exhibitions university art galleries conducted. Since then a lot more people do these kinds of things. But somehow or other, my husband and I ended up putting together an exhibition for her in the small art gallery on Depression Glass, and we called it "Glassware for the People: Depression Glass, 1929-1939," and this was in the late summer, early fall, 1993. And it was very well received. And of course one of the results of the earthquake was by that time we'd packed it all up and brought it [home], and it was in the garage, and the cartons went over, and the boxes went over, and a huge portion of my husband's collection got busted up.

As sort of an avocation, doing the exhibition, was interesting, which helped move us into another one, which grew out of something I found in one of my mother's closets and was asking about, which was a small aluminum tray that looked like it was all handmade. I asked her about it, she didn't know anything except she'd received it as a wedding gift. And so I started just trying to look for information about that. That's how *that* started.

[01:34:31] And then Freeman [husband William Freeman], of course, discovered people were collecting the stuff, and that was one more thing he could buy at the flea market. So he started buying stuff and looking at it. But I was collecting information about it. And then we both got very fascinated, because here was a whole area of use of a material, the use of aluminum, which was a relatively new material to be using in the first place, in a different mode for

consumers, and during a different, interesting design phase. And none of it had ever been documented. There was just nothing. You couldn't find anything except a couple of things [that] were collector books that said, "Here's this, and it has this mark. Here's this, and it has this mark." And I thought, "Well, that doesn't tell me anything!"

[01:35:31] Anyway, so we collected information and Freeman, of course, was collecting pieces. He ended up with thousands and thousands of them, but somehow we got around to agreeing with Louise that we would put on an exhibition for her, with all the information we'd gathered, and the like, with a selection of aluminum pieces from different collections and different places we found them, and ended up getting pieces from across the United States, in fact, from people that had them. Of course once you hear the word "aluminum," you think, "Who the heck wants to do anything with *that?!*" But what people don't realize is this is focusing on pieces that were made in the early to mid-1900s, and it wasn't that long before that, that because there was no commercially effective process for the production of aluminum, because you don't just dig it out of the ground—you know, you have to start with alumina [bauxite], and then process it to get aluminum. The process of creating the metal, bringing it into metallic form, was so time consuming and so difficult that for a long time aluminum was considered—if you had something aluminum, you had something that was more precious than gold. It sold for more than gold. It was worth far more than silver. It was only near the very late 1800s that it became commercially viable to produce in some sort of quantity. And then nobody knew really how to work it

and use it, whereas with iron ore and steel, people had been working with steel for centuries, right? Nobody had been working with aluminum for centuries, and it wasn't clear how to make it harder or how to make it softer, or what the different strengths were. There was a whole bunch of stuff about aluminum that wasn't even known. So when we talked about trying to put out some sort of info or intro about aluminum and aluminum things made early on, it takes on a different feeling when you know that gee, this stuff used to be really, really, really rare: Napoleon Bonaparte's baby spoons or something like that. And there are things that are in top-notch museums, simply because they're made of aluminum early on. The cap on the Washington Monument: they had to tour that around because it was so unusual.

[01:38:45] Anyway, we put together this exhibition, and we were planning it in between other things, and of course then we had the earthquake. Poor Louise, it took out all the art galleries, took out most of the Art Building. She had to use temporary spaces. In fact, for her large art gallery she was using a dome, much like the administration was in for many years. And so we finally ended up in early '95 putting together the exhibition for her while she was trying to move things around in the dome, while at the same time I was having a fireplace jackhammered out of the middle of my house, because nobody could get to it before then. We put together this exhibition that we called "Depression Silver," because they had later on called aluminum "the poor man's silver." "Depression Silver: Machine Age Craft and Design in Aluminum," and we had that at CSUN from late April through May, and then it travelled up to little

Carnegie Art Museum in Oxnard, where it was from mid-June 'til the end of July. But that was the whole thing. I got really interested in documenting and putting together the history of these things, and what was happening in manufacturing at the time. So I ended up making presentations and writing papers, and a book, and a whole bunch of research monographs documenting all these things. I made a number of presentations to the Pennsylvania Historical Society, which didn't even have documentation of the industry, of this facet of the industry. I mean, there you were in the home of Alcoa in Pennsylvania! (laughter)

AD: Wow.

BJC: Turning the activities away from the parallel lines of the exhibitions and the like, and returning back to what we were doing specifically within the College of Engineering and Computer Science, the formation and restructuring of all of these degrees and identifying them with specific disciplines therefore really set the stage then for the formation of a new department, which became the Department of Manufacturing Systems Engineering and Management. We called it MSEM. And that whole path is what I consider to be sort of the fourth and final phase of my CSUN [career].

AD: Let's talk about the new department. How *did* it come about?

BJC: Well, I initiated it. Leave it to me! (laughter) But it made sense. At that time we had two completely disparate discipline areas in the same academic department that had virtually nothing in common. One was civil engineering, and things related to that; and the other one was manufacturing engineering and things related to that. And that had grown up over the years that way. And it was

effectively like running two departments in one, and we would actually get accreditation questions about, well, how can you have a chair who doesn't know something about this discipline, and making decisions about tenure-track and positions? And it made sense to divide those two into two departments, now that we had separate degrees, and they could take charge of their own degrees, their own accreditation and the like. It was not a popular idea in the college. The general attitude was, with most of the faculty—and I don't blame them, I might have had the same attitude—"Oh, that's going to cost us resources. They're going to take from us to create this new department." If the faculty and labs and all the rest of it hadn't already existed, I could have understood that a little bit better, but I mean we were effectively already there. And if they decided to create a new department, then yes, they would need to have another department chair, and at least one staff position to support that department, but that would be part and parcel of *if* the university approved it. Then the funding would come with that. So I wrote proposals, wrote proposals, and did analyses, and wrote proposals, and talked to people. We had a small group of faculty who wanted to do this, and we kept kind of pushing, and finally one of the people we had to send a proposal to was the Provost and Vice-President of Academic Affairs, who at the time was Louanne Kennedy. First of all, she thought it was a good idea. The provost usually met with accreditation people when they left campus. Apparently she had gotten some question from one of them, or comment from one of them, about the mixture of programs and the like. After all of that, she approved the formation of the establishment of a new department which we called

Manufacturing Systems Engineering and Management, to reflect the breadth of what we were really looking at.

AD: [01:45:22] Okay, and now you've gotten the approval from the provost.

BJC: Yeah, now you've gotten the approval from the provost….

AD: And you've had the light bulb come on that you wanted to….

BJC: Different kind of hard work begins. (laughter)

AD: What was involved in implementing and developing the new department?

BJC: Well, the first thing, once you've established this entity, you need to make sure that in all the miserable computer systems and all the rest of it, it's established there, so that all the faculty involved can be assigned to this new entity; the laboratories associated with it can be assigned to this entity; the curriculum has to be assigned to that entity; new curriculum has to be developed in order to flesh it out and make it an accreditable curriculum. You have to set up accounts. We didn't have any money, so we had to find a place for a department office, and scrape together [furnishings]. Fortunately at that time they were still getting rid of excess surplus furniture left over after the earthquake, because it had been damaged somewhere, and so we got a bunch of office furniture by taking the surplus that had been damaged elsewhere, particularly in the old administration building, to furnish things. Getting all of that, trying to track down your alumni, creating web pages—it just went on and on and on. And then trying to grow the department, because it was a small department. And of course it never would be an enormous department, it wouldn't be like a department with forty or fifty faculty members, ever—not on this campus, and probably not on any campus—

but it needed to grow, and so we needed to recruit students and we needed to make sure we had the curriculum offered properly. I did all the proposals and everything to develop an online program in engineering management, a Master of Science in Engineering Management that had to have approvals from the Western Association of Schools and Colleges, and the chancellor's office and all that. But it brought us a whole bunch of new students. It was just a lot, a lot, of work. We had to upgrade our laboratories because we had to get our programs accredited since we were a new entity with new degrees. It went on and on, but overall, I would say, in terms of developing the new department, between the time you started, I got the approval, which was effective July 1, 2001, and then I left at the end of the spring semester, May 2008. Between that time we had tripled the course enrollments through a variety of ways. And our student population, multiples of student majors, is what I wanted to say—our student population of majors had multiplied by five times, so we had five times as many majors in our programs when I left, as we had when we started. And the most fun, probably, during that time was working with the graduate students and advising students. I think the most important thing you can do in an institution is do things so that students feel comfortable, so that they can succeed, and you do what you can to help. I particularly worked with tons of graduate students—still in touch with lots of them. It was very rewarding, but very exhausting. I was too old for that! (laughter)

AD: [01:49:58] I imagine—and after thirty-three years, though, and ending your last seven years having thought of, and building, developing, implementing a new department, you left quite a legacy and must feel very….

BJC: Yes, it changes a lot on campus when all of a sudden you have a new academic department. (laughter)

AD: Yeah.

BJC: Makes a difference.

AD: So 2008 comes, and you're retired. What did you do in retirement to stay connected to your many students and to the school?

BJC: Well I guess probably the most important thing I ended up doing was as I was retiring, I established an endowment for Women in Science and Engineering. I based it in the Oviatt Library because I consider the library to be the heart, the center, of the university. And you can define sciences in particular in a number of ways, which means that you can find different pockets of them in different colleges, so you can reach into the silos a little bit easier to identify things. And my thought was to be able to perhaps carry on and keep an eye on things that had been developed for women in science and engineering, because we had had some really good things going in the college for quite some time. And our female enrollments have gone from like somewhere around 4 percent to a little over 22 percent. And we were still stumbling along and doing reasonably well, actually, until the earthquake hit, and then for some reason nobody was minding the store, and so things hadn't become institutionalized enough. And the enrollment today in the college is more like 12-13-14 percent, which is even

below what's going on nationally. So I thought, "Okay, maybe this is the way you could make a difference that would *institutionalize* some endeavor to keep these things moving ahead, to pay attention to students in these areas and activities in that area." And so we've got a board, and it's been very, very productive. Some of them are former CSUN students, some aren't. They're from various disciplines. One of the women, it turns out, was a biology major at CSUN when I started Women in Science and Engineering, and designed our very first logo for that. It was amazing, after all these years, there she is! And now she has ended up on the board, working with things. So we've progressed to the point that they have some activities each year. They have a small amount of funds where they can award some small grants to start doing some research. There's a collection: there's some funding for a special collection so we can build up research collections. And I expect that that will continue. I was fairly active the first two years, and then life happens and other things happen, and so it was not possible to maintain a high level of activity, although I, of course, keep in touch. I occasionally go to a meeting or an event. I'm proud of what they're doing. That's what's nice about institutionalizing it: if you get sick, then the institution goes on (chuckles) and does its thing, whether you're sick, well, or anything else.

AD: Uh-huh. Well, that was a beautiful way to end your career, to set up the endowments, and I think the school recognizes you very much for that. I thank you, Bonnie, for sharing your life, your history, your years at CSUN, and doing this oral history narrative for the digital archives. Thank you.

BJC: Okay. You're welcome.

[END OF INTERVIEW]