Oral History of Patricia Anderson

Interviewed by:
David C. Brock

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Brock: Okay, hi, Patricia. Are you still there?

Anderson: Yes, I am.

Brock: Okay, great. Well, thanks so much for agreeing to participate in this interview with me today, and I thought we could begin just by talking a little bit about your life before you came down to the San Francisco Bay area and working in Silicon Valley. I saw from some biographical notes that you sent that you were born in Petersburg, Alaska. I wondered if you could just talk a little bit about your family of origin and what Petersburg, Alaska was like when you were growing up.

Anderson: Okay, yeah, actually, I was born in Seattle.

Brock: Oh.

Anderson: And we moved to Petersburg in 1953 when I was almost five, my father was a power lineman, and he had worked for the city of Seattle, his sister's family was a fisherman family in Petersburg. So, we moved up there in 1953, me and my four brothers. I grew up there. My folks divorced, and my mom remarried, and I ended up with two more brothers. So, I had six brothers.

Brock: Oh, geez.

Anderson: It's on an island called Mitkof Island in southeast Alaska, and Petersburg is known as Little Norway. They celebrate Norwegian Independence Day. Eighteen hundred people lived on the island when I graduated in 1965. I was accepted at three colleges in the northwest: Western Washington, University of Oregon, and Oregon State but couldn't afford to go there. And so, at that time, my father was with his second family in the Bay Area. My stepmother actually worked at Foothill College, and so, after I graduated, I went to Mountain View and lived with them and ended up working at Foothill before I started school there.

Brock: Oh, I see.

Anderson: In the fall of 1965.

Brock: And what work were you doing at Foothill?

Anderson: I worked in the office collating booklets. I actually-- because I had taken an electronics class in high school, they had me hand drawing in the resistors and electronics symbols for one of the manuals they had. So, I did collating mostly in the office while we were getting ready for the school year.

Brock: Was-- in growing up, was electronics hobby-ism at all part of your life, or was there a lot of electronics at home because of your father's career?

Anderson: It actually was my stepfather--

Brock: Oh.

Anderson: He was the telephone man in Petersburg. He did the central office. He put in the phones. He did the splicing on the poles. And I used to go down to the telephone office with him where he and one of my brothers-- while he would fill the great big huge batteries that backed up the switches for operating the central office. And my mother was one of the switchboard operators. And we actually-- my family has the old switchboard, the old pull the wire out and plug it in. My mom was an operator shortly after we moved to Petersburg. So, I was always involved, and of course I guess probably growing up with six brothers, I just was more interested in other mechanical type things, and even after crystal growing and my college years, I did end up going into the telecom business myself.

Brock: Right.

Anderson: So, yeah.

Brock: What about-- did you have any particular interests and hobbies while you were growing up in Alaska?

Anderson: We did the fishing, and the-- you know just jigging for herring down the docks. No, I can't say that there were hobbies. It was of course southeast Alaska is kind of the rainforest. So, you were-- played outside, and you were usually wet. But I don't remember hobby-wise other than I was interested in math. That actually was in the aptitude test which ultimately got me more interested in math and science when they were doing those tests. I think even at Foothill, I did some aptitude tests, too. But hobby-wise I guess it was just really school and playing outside. We didn't get TV in Petersburg until I was a senior in high school.

Brock: Wow.

Anderson: So, we would hear about people coming back and watching "American Bandstand," and "Bonanza," that kind of stuff, but yeah, I was almost out of there before TV came to town.

Brock: Was reading a big part of your life then?

Anderson: I did read, but I've got to say it was probably "Nancy Drew" and that kind of stuff. I didn't get anything technical. I did graduate. There were twenty-four in my graduating class. I was the top female, but I didn't even make the upper ten percent. I was number three. And so, I did a lot of reading and yeah reading wise I'm going to say I was a mystery novel reader, "Hardy Boys," "Nancy Drew."

Brock: Right. Well, how did you-- when you-- it seems like the move from Alaska to Mountain View sounds like a big contrast. Was it-- did you find it-- what did you make of Mountain View when you arrived in 1965?

Anderson: Well, going from a town of eighteen hundred to a college campus with probably, I can't remember what, ten times--

Brock: Yeah.

Anderson: The population of my hometown, I tried to quit college. I had a lot of very tearful collect phone calls to my mom wanting to come home. I was very homesick. My whole first semester, as I said, my stepmother worked at Foothill, the whole first semester, I sat down in her car and studied. So, I did very good grades the first semester. I did-- I-- yeah, I was-- it was very-- it was a cultural shock for me. And so, I did, I tried to quit, and my mom had to talk me out of it. And I'm glad she did, and pretty soon, by the time I-- I sang and played drums through high school. So, I did join the Skyline Chorale that was up there at Foothill, and that's how I was-- how I socialized as I got to

know all the group that I sang with. So, yeah, that was-- it was, definitely, it was hard. It was definitely hard. I did not even go into the campus center that whole first semester. I would go around people and whatever to get down to my stepmother's Corvair where I used to study.

Brock: It sounds like it must have been really overwhelming.

Anderson: It was. It was very overwhelming.

Brock: Well, how did you find your way-- I mean, obviously, you stuck it out. And how did you find your way into the data processing course? Could you describe that?

Anderson: I am thinking because-- just thinking about the aptitude test, and, quite frankly, I don't know if it was after I got down there to Foothill that the scientific data processing program is what appealed to me. I-- like I said, I liked math and I'd taken math. I started calculus. And the scientific data processing area, it was-- part of it was key punch and the-- doing the IBM 1620 and whatever. I can't think that I left Petersburg with that in mind because I went down right after graduation. As a matter of fact, I remember it was a pretty-- pretty rushed deal because my stepmother was working on the campus. And since I wasn't able to afford to go to the other places that I was accepted at, I think they were trying to get me a job so I could get some money. Even in Petersburg, my math teacher hired me to-- he and his wife hired me to come clean their kitchen cupboards.

Brock: Right.

Anderson: So, I could make some money. I think I got down there, and I think when I started looking around you know while I was working there, the data processing interested me. And I think that's-- I really think I decided to do the program after I actually got down there.

Brock: I was just wanting to ask you about that scientific data processing program that you found and began at Foothill. If you could just describe what it was like for you.

Anderson: Well, I think I disliked the keypunching, and I'm still not a really great typer, and so I believe that I-- the keypunching part, I think I was more interested in getting to the programing, which was with Fortran IV, but I did the keypunching and I know I had to pay somebody to do my cards for me once because it was-- I just think it was really more IBM card-y than necessary. So, when I got to the programming part of it, I just had somebody else do the keypunching, personally handed off the cards. As far as the program, I ran across my-- the GP-- my final grades and was looking at some of the classes. And I can't remember all of them. As far as the keypunch, I remember that one. There were other data processing classes. It wasn't just programing. And so, that's why when I thought when I graduated that I could find a-- you know, a computer job up in Anchorage when I came up here, and there was no computers here.

Brock: Right.

Anderson: So, the program, I really don't remember much more than doing the keypunching. I do have samples of my programs somewhere. I could not find that and the grades because wanted to look at the classes I was taking. I did have to take-- because the scientific end, I did make it through three semesters of calculus before I gave up and decided I wasn't as good a math person as I thought. So, I don't remember much more than that.

Brock: Okay. What about-- I was interested in the kind of-- your fellow students at Foothill at the time doing the data processing class work. Were they-- could you describe the other people who you were with?

Anderson: Boy, no, really I-- the only girl that I had as a friend was in calculus. She was a friend of mine, and I don't even think she was in the data processing program. I think she was just taking calculus. I don't remember too much about the other people. Like I said, the first semester, I probably didn't even look at them.

Brock: Right.

Anderson: No, I'm drawing a blank as far as knowing much about them. I do know that if-- I'm thinking the main guy that must have been in the program was the one that knew about the job or if either of them worked at Elmat.

Brock: Yeah.

Anderson: And he was the one that told me I should go interview there. But even then, I'm a little fuzzy on who he was or if he was part of a job finder for the college or what.

Brock: Right.

Anderson: Yean, no, I'm sorry. I don't really remember the other people in the program.

Brock: What about generally, like were you the only woman in the courses, or was there a good mix of men and women, or what was that like? Do you recall anything about that?

Anderson: I would think if I thought I was the only woman I would remember that.

Brock: Yeah.

Anderson: Just mainly because that's kind of what I ended up up here getting into the IBEW where they're very slack on women, and we worked on the slope on the pipeline. So, I do know when a woman is breaking into a field. And I might be tempering that with knowing that there were mostly women who were doing the crystal drawing.

Brock: Yeah.

Anderson: If I remember right. So, I think I would remember if I thought I was the only woman in the class. I do know when it was in the math classes, there weren't that many.

Brock: Right.

Anderson: Because I did become friends with the one lady, and I think we were only a few of us in the calculus classes.

Brock: Okay, and were you working while you were going to school during those years, or--

Anderson: Yes, I--- like I-- I worked at the college before school started, and after school started, I was-- my father was no longer a power lineman. He went to work for the Stanford Research Institute as a maintenance electrician, I believe it was. And then I, to get more money, I actually cleaned house and babysat for one of the doctors at

Stanford Medical Center up in the foothills there. I'm trying to remember, the real windy road that goes up behind Palo Alto.

Brock: Is that Skyline?

Anderson: And Los Altos Hills. So, yeah, so I would clean house and then babysit for them to make money and of course used my stepmother's car to get up there and clean. So, yeah, so I did that.

Brock: Right.

Anderson: And then I started-- I did find I had, ironically enough, I do save everything. I have all my pay stubs from when I worked there, and it looks like I started work at Elmat in April, I think it was, of '68, which would mean, actually, it would mean that the guy that got the job must be at De Anza because moved over to De Anza '67, '68.

Brock: Right.

Anderson: So, I think I did start working, and I was working because-- oh, because I think I only had a few classes to go in '68 that I was able to work in the day time and went to school at night or whatever. I'm just looking here. I've got the '68 pay stubs here. So, that might be-- yeah, that's April-- March, so, of '68. I graduated in May of '68, May or June. So, it looks like I started in March of '68 here with Elmat. So, I had to have been going to school or maybe I was almost done, and I went to the graduation ceremonies when they had the—like I said I was in the first graduating class that De Anza had.

Brock: Right.

Anderson: So, yes. So, I think I worked there as I was finishing up school.

Brock: Makes sense.

Anderson: And then I quit after I graduated to come back to Alaska and spent time up here, went back to Petersburg, came to Anchorage, and then I think I went back to Petersburg. I think that's when all the water froze that was in the water main that went out to our house, so I wasn't going to spend the five or six months without water as my mom and stepfather did.

Brock: Yeah.

Anderson: And then I went back to California and got my job back at Elmat.

Brock: Okay. Well, maybe we could talk-- I would-- so, just about getting to Elmat. If somebody had told you about that, that you should go check it out for jobs. Now, was- had you had any exposure to the semiconductor industry or-- up to that time or--

Anderson: No.

Brock: Okay.

Anderson: No.

Brock: And was it-- what was attractive to you about the position? Was it-- could you just talk about, you know, going in and seeing what it was all about and why you decided to take the job?

Anderson: Well, you know, I think I just-- I think I really wanted a job.

Brock: Yeah.

Anderson: I think that was it. I think this, guy whoever it was, and if it was at De Anza, maybe that was where, I believe that he was-- I'm almost thinking he was like a rotary club-- not rotary club, but a-- I think he was looking for workers. He may have already been working there at Elmat. And I think he was almost recruiting the people to go to work there. I'm not remembering as this guy was a real friend of mine or anything like that. I'm just thinking that he's regarding people that either he thought that might be interested. And so, I went over there and looked at what was going on and got hired.

Brock: Okay.

Anderson: Yeah, I mean I really-- I'm kind of fuzzy about exactly how that all happened, but I know it wasn't me that went looking in the paper for it or anything like that.

Brock: Right. Well, could you-- now, was this the crystal growing facility that was-- was it on National Avenue in Mountain View over by Fairchild and the 101?

Anderson: No, let's see. I think I saw the address here. Well, they do have National Avenue on the envelope here that I'm looking at, but I thought-- it must have been. I'm looking at-- I don't know if they had moved after I came back. None of these stubs have the actual address. The envelope does that I have been storing the stubs in.

Brock: Yeah.

Anderson: Does say National Avenue. So, that--

Brock: Okay.

Anderson: Might have been it.

Brock: And-- But they--

Anderson: Several envelopes here. I'm sorry?

Brock: Oh, I'm sorry, but you said they had moved the facility by the time you rejoined them in 1969?

Anderson: It seemed like they had, but maybe I'm-- you know, I'm not sure if it's so much that they moved it as I think I've been calling it Elmat and Elmat, and it was until I actually looked at the envelope that Elmat was what they originally called it, but in the fine print it says Division of Semimetals.

Brock: Yeah.

Anderson: When I came back, it had been changed to Semimetals. Elmat was no longer part of the name.

Brock: Right.

Anderson: And I think that's what I referring to.

Brock: Okay.

Anderson: I don't know if they actually moved or not.

Brock: I think it got sold right around the time that you first worked there to General Instruments Semimetals Division or whatever. So, that would make perfect sense.

Anderson: Okay, all right, yeah because the one-- yeah, the one envelope here just says Elmat Division of Semimetals, and then the rest of them Semimetals Northwestern Division.

Brock: Yeah, that would make perfect sense. Well, could you--

Anderson: Okay so, moving I don't think they did. I don't really remember that I went to a different place.

Brock: Okay. Well, could you describe what you remember of the first facility where you-- well, the facility where you were working? Like what the building was like and what the crystal growing area was like?

Anderson: I can remember coming in the back door, and it must have been very close to the crystal growing area because I don't remember going down a bunch of halls or whatever. I know the wafer polishing area was down a whole different side of the building farther down the hallway-- down a hallway. And believe I'd only really been over that way-- and I have a vague feeling of looking through a window, of seeing the machines that were polishing or whatever in there, but other-- I don't remember getting over that way very often. We mainly-- and I worked shift work. So, I know there was a time when I was just coming in at nighttime. I did the graveyard shift. I did a swing shift too, in the few years I was there when I came back the second time.

Brock: Yeah.

Anderson: But I remember it being an old building, coming in the back, and pretty much going directly into the crystal growing room. And I was trying to remember how many machines are in there. I don't think there were that many. I'm thinking like maybe eight or ten of them.

Brock: Okay.

Anderson: But that's-- I just remember it being an industrial type of-- drove around the back and came in the back door. I mean I don't even know if there was any kind of security or whatever or if you just walked in. I don't remember having any kind of a door badge or anything like that, or I don't remember punching codes.

Brock: Yeah, and what was the-- so, what was the training like to get you up to speed on how to do the work?

Anderson: Well, I was just looking, and I know in one of the pictures I sent it just showed kind of the top of this three page typed-- and don't know if I typed it because there are definitely typo errors, but it's the crystal growing procedures.

Brock: Yeah.

Anderson: And I just was going over it, and I'm like I don't remember. I've got a feeling this is what I was handed, and I probably just watched somebody do it for a while, but I think it was pretty much get in there, and I probably took these procedures home and read them and then came in and looked through into the furnace area with the really, really dark visors that had a little handle with a metal frame around them, really, really dark glass.

Brock: Yeah.

Anderson: And I am looking at this procedure, and I've got a feeling it's just a typewritten what to do. And I don't remember going through a real-- well, I probably followed somebody around. I assume I just started doing it.

Brock: Yeah. Was it-- what was it like in there? Was it-- in the crystal growing area? Was it loud, or was it hot or,-- what was it-- what was that like?

Anderson: I do remember it being warmer. Of course, coming from Alaska, I didn't like too warm weather. I remember it being warmer. There definitely was a noise because I think there had to be some kind of fans going, but I'm not sure if it was-- it wouldn't be fans on the machines because there were big adjustments that you made to furnaces were right there, and I'm not sure if they had something in them, or if it was probably air exchange just for the room.

Brock: Right.

Anderson: Another-- it got up to fourteen hundred-- over fourteen hundred degrees inside the machines. And of course, when you had this-- you know, you took over from the shift before you, probably finished off somebody else's crystal, or you're, whatever, in the middle of one, depending on what the diameters were. And so, the machine would be having to be torn down. And that's where the set-up men would unhook them after they cooled down. So, I'm not sure if the heat was just dissipating into the room, or if they had a way of fans sucking it out. I don't quite remember.

Brock: And while the-- in the-- was there a lot of sort of like active management of the crystal growing process while it was pulling a crystal, or were you-- was it more monitoring to make sure that a kind of automated system was doing the right thing?

Anderson: Oh, it wasn't automated.

Brock: Yeah.

Anderson: Oh no, we needed total control of what was going on. We were constantly looking in, seeing what the crystal was doing, and adjusting either the pull rate or the temperature.

Brock: Okay. And you were just-- you were using just visual inspection of what was happening at the interface of the crystal and the melt or you were seeing what the crystal was looking like as it was drawing out to make those adjustments?

Anderson: Yeah, you were definitely seeing if it was starting to come in or out and either adjusting-- slowing it down to make it come out if it was tapering in, or if it was growing out too much, you might have to raise the temperature to try and stabilize the diameter.

Brock: Right.

Anderson: Yeah, it was total visual all the time. It was watching. I'm just reading through these-- the directions here, the procedure. One place where it has all caps, and it says-- what was that-- taking the crystal over the shoulder, and it showed the first point of growth, you must know what the crystal is doing, and then it has number one is there, and all caps, it says, "Don't lose control." So, it was very important to be watching all the time.

Brock: Right, and I suppose that-- I mean I suppose that that means that, you know, some people would definitely be better than other people at doing this just in terms of their attention or the feel for the machine about just how much to increase or decrease the temperature or the pull rate or whatever other factors there were. Was that--

Anderson: Yeah, it's funny that you should say that because I think I put in my bio that a good friend-- a lady that I met there became a very good friend of mine. And she actually lives in San Jose. I hope. I haven't been able to get a hold of her. But, when I did see her in 2015, I have a little Sprinter RV, and I went down, and I saw her, and we went out to lunch. And she's the one that remembers names of people that we worked with and whatever. And she said, "You know--" there was a blonde lady, and I-- even though she said it in 2015, I still can't remember the lady's name. She says, "You know, what's-her-face, she was number one, but did you know that you were number two of all the crystal growers they had?" So, I had produced-- I was not number one, but I guess I had done okay to have a reputation of growing a lot of crystals.

Brock: Right.

Anderson: So--

Brock: So, it definitely was, yeah, a skilled-- something that you could really develop a skill for.

Anderson: Oh, yeah.

Brock: How-- about how long would it take just generally to, you know, from start to finish, to grow a crystal?

Anderson: Well, you know looking at this crucible. I've sent a picture of it. It's the one that-- I got every bit of melt out of it, which you don't normally-- it doesn't normally happen because you can't see the bottom of the crystal as you're tapering it off. But I'm looking, and I'm trying to-- well I guess I could pour water in it and see how big it is. Our crucibles weren't that big, at least this one. And I don't remember there being different sized ones. Maybe there were. But I think I was able to do a crystal-- some of these are like an inch and a half in diameter. And this little guy, he's only about three quarter-- under an inch. I think I could almost pull a crystal in a shift.

Brock: Okay.

Anderson: And I have read, and since getting a hold of you guys, I did go on and Google a little bit of crystal growing or whatever. And I was surprised to read things that it took a long time to grow. And I thought, ooh, well not these. So, maybe just because they were a smaller operation or something like that. These crucibles are-- this one anyway that I drained is just not that big.

Brock: Right.

Anderson: And the melt line, I don't know. I'm curious. I'm in my kitchen here. I'm going to find out. It doesn't look much more than a cup and a half or something like that. Let's see. It's one cup. Yeah, I'd say maybe a cup and three quarters of melt in this crucible.

Brock: Right.

Anderson: And so, you're pulling, and of course the pull rates were just these very minute units, pull and temperature. So, I think I could pull one, like I said, we did finish off each other's. You would come on shift because it was going twenty-four-- I don't know if it was going seven days a week, but definitely going twenty-four hours a day during the week.

Brock: Right.

Anderson: Yeah, I think pretty much-- and some of them, of course, were smaller diameter ones. I'd say we pulled them pretty fast, but that might be wrong. I mean with this amount of melt-- I've got a feeling that there must be bigger sized crucibles because I'm holding one of these that I yanked out of the melt, and that would have been a pretty short ingot as far as I can tell, but maybe not.

Brock: Right.

Anderson: So--

Brock: Okay.

Anderson: Yeah, I don't remember different sizes, but there may have been different sized crucibles.

Brock: True. Were the operators of the crystal growing equipment-- were the production staff mostly-- it sounds like they were mostly women?

Anderson: I think for the growing, I think it mostly was. There was-- as I remember, there was one guy, really, really tall guy. He was a grower. My friend, she later married our set-up guy. He did just set up. So, he didn't, but there was a couple-- I do remember one tall guy and possibly another guy. So, I don't want to say. It might have been more than what I thought. I just-- of course, I palled around with the ladies so--

Brock: Right.

Anderson: Yeah.

Brock: And what was the kind of supervision or management of the production area like? Was it-- were you kind of on your own, or was somebody watching over your shoulder, or what kind of-- how was it for--?

Anderson: I don't remember ever being micromanaged, and of course-- of course, the nighttime growing, I don't remember much of anybody being there. I'm sure we had a shift foreman or something like that.

Brock: Yeah.

Anderson: But I-- no, I don't remember-- maybe the foreman would look in or whatever, but we were pretty much kind of left on our own, doing our own thing. And I think-- I'm trying to remember. I believe we grew crystals for like Intel and Texas Instruments. I was hoping that I had a piece of the paper showing-- I know I have a log sheet, and there's not much on it, and I am hoping that I'd have these-- some, who all we grew for.

Brock: Oh, yeah.

Anderson: But there was no micromanagement. There was-- just stuff's growing away. And I don't know, we might not have done all machines at night, as they finished, it maybe have been pared down, because I don't remember there being as many people on the graveyard shift as there were on the day shift.

Brock: Right.

Anderson: There probably was a lot more oversight on the day shift, that's for sure.

Brock: <laughs> And what about the kind of racial makeup of the production staff? Do you remember what that was like? Was it--

Anderson: Hmm, I do not remember seeing anybody other than white people. I won't say-- oh, wait. No, there was one guy, he was more of a middle manager. I believe he was Hispanic there. And my good friend, she was Italian, grew up in New Jersey. But other than that, I'm not thinking there too much of a blend of other races.

Brock: Okay. And I was just-- for the growers, or the other people in the production side, was there much socialization at or outside of work amongst the employees?

Anderson: Yeah, I used to go over-- there was a place where we went a couple times, a bar somewhere. And then another lady that grew crystals, I believe that she'd been a runner-up to Miss California some years before. And we socialized a couple times and went out a couple times. And we ended up having a disagreement, and then actually later on that was one of the reasons that I saw the Hewlett Packard ad, and I decided to leave Semimetals, but yeah, we did go out, we did have our—but working graveyard shift, though, was, tough, yeah, I was home in the daytime, and as Lois was my good friend, I spent a lot of time with her and her kids and her husband. Her first husband, yeah.

Brock: Right. Thank you. Well, I was wondering if you could just describe a little bit more about what you can remember of what it was like for you on a shift to be growing one of these silicon crystals. Just you know, were you standing? Or were you sitting? It sounds like you had to be right kind of glued to the crystal puller. Could you just kind of describe it a little bit more about what you can remember of that?

Anderson: I was definitely standing, because I was running probably, I want to say, three to four machines.

Brock: Oh, wow.

Anderson: And so I was just moving around, looking at every machine. We were constantly. I don't know-- I think we did take breaks, so somebody else would cover for you. But you literally had that-- you know, we would look through the visor-- oh, I can see, I think the guy's even holding it in this picture but I do know it's a rectangular metal with the darkest, darkest glass-looking like thing. And we were constantly just walking around, looking in, and making adjustments. Just near to do little adjustments on temperature or pull rate. I don't believe we did anything with the rotation. The crucible was going one way. The seed rod was going the other. So I don't believe there was any adjustment there, it was all temperature and pull rate. But no, we didn't-- I think there were probably some tall stools that we could sit down for a minute or two, and just go around, but I remember standing a lot.

Brock: Wow, okay. And let's see. And these were-- you were growing just pure silicon crystals, so you were, you know, you didn't have to add anything to the melt, any dopants or anything like that?

Anderson: Oh, yeah, yeah, they were doped.

Brock: Oh, yeah?

Anderson: Oh, there was phosphorus, boron, the 3-5 materials, I think it was phosphorus and boron were the main ones that I remember.

Brock: Could you talk a little bit about--

Anderson: But I'm not sure if the set-up men added that? I'm not quite sure if it was-- I think maybe it was added after the silicon was melted, but I'm not positive if it was in there when they turned on the machine.

Brock: Oh, I see. Did you have to handle a lot of the chemicals yourself then, or--

Anderson: I don't remember handling anything. Yeah, I don't think I did anything other than do the growing.

Brock: Okay. And let's see. Is there anything, so was it brightly lit, or dimly lit? What was the space like? Was it kind of--

Anderson: Well, I think it was bright. I think it was industrial fluorescent. <laughs>

Brock: Yeah, okay.

Anderson: But yeah, I don't really think-- yeah, and I'm looking at that picture dealing in the back of the book, and I think that's exactly where it was, and it's pretty bright.

Brock: And just on a kind of a personal level, would people bring their meals with them and eat in a breakroom sort of a situation? Or--

Anderson: I think that was it. I don't think we had any-- I don't remember us having to change into daily really clean garb or anything like that. May have had a lab coat that we wore. But I don't remember us women needing to go to a changing room. So I think it was semi-clean, and whatever contaminants were inside the machine, we tried to burn it up, and attempt to redo it. And I'm not sure, I can't remember how many times we would attempt it, if the crystal wouldn't get a good structure. I think a couple of the melt pulls of those little buttons where we must have tried a couple times to get the contaminant out. <bell rings> Oops. It's that one of them falling on the floor. We would try and get the contaminant burned off; I'm not sure how many times we attempted that before we just yanked the whole crystal out.

Brock: Right.

Anderson: Yeah. So there must have been a break room. I'm sure there was.

Brock: Okay, and it was-- and how was the-- you know, did-- I guess I'm wondering about how well the job of a crystal grower paid compared to other things you were looking at, at the time. Was it-- how did you see it?

Anderson: Well, funny that you ask that, because I was looking at these stubs and I went, "What?!" But other than babysitting and cleaning house for the doctor, I didn't have any other jobs down there, nor I remember looking for them. But I will tell you that I started-- my March 30th to April 12th, '68 pay stub, shows that I made two-dollars an hour! And that was until I left at the end of June, it would have been June, they had raised me to two-dollars and ten-cents an hour.

Brock: Wow.

Anderson: So that's what I made in '68. And when I came back, I believe I started a little higher than that. I never got over, let me see, I got maybe was up to $2.50? Let's see. Well, that's from '69 to July of '72 when I came back to Semimetals, I started at $2.20, and when I left there in July of '72, I was making $3.86. And then July of '72 is when I went to Hewlett Packard.

Brock: Yeah.

Anderson: So yeah, it was not as much as I thought! <laughter>

Brock: Well, I don't even know when the Federal minimum wage came in.[1] You know, I have to look and see how that compares to other wages at the time. I don't have a good sense for it.

Anderson: Well, I must have thought it was pretty good, because I stayed there and kept working. So I must not have heard of much else.

Brock: Right. <laughs>

[1] The U.S. federal minimum wage was $1.60 per hour for 1968 through 1972.

Anderson: And Hewlett Packard actually hired me away from Semimetals because when I saw their ad, I went and interviewed, and they offered me a job, and then Semimetals made me feel guilty about leaving them, so I turned down the Hewlett Packard job. And then they called me up, and offered me 50 cents an hour more! Then I finally did give the notice, only discovered, when I'm looking at my pay stubs, even with the 50 cents an hour more, it was 36 cents less than what I left Semimetals with. So I went to Hewlett Packard, so I left that one job, Semimetals.

Brock: Yeah.

Anderson: So anyway, yeah.

Brock: Well, could you? Maybe we could talk a little bit about-- you were at Hewlett Packard for about three years, is that right?

Anderson: Yeah, it looks like July of '72 to February of '75.

Brock: Could you talk about the-- could you talk about your experience at Hewlett Packard, like where you were working. And I know you were growing crystals, but you were growing gallium arsenide crystals for LED production.

Anderson: Right.

Brock: Yeah, could you maybe talk about where you were and what the facility was like, and all of that?

Anderson: I was in one of the-- I think it was a one-story building right there on Page Mill Road, down towards the bottom.

Brock: Okay.

Anderson: And I think that's what-- I'm going to look at the-- 620 or something Page Mill Road. And it was kind of a low flat building and it was just a one-story building, right across the parking lot from where they did their polishing and whatever. And I did light emitting diodes, and gallium arsenide crystals all in the same machine that Elmat had, Semimetals. And I did that for, I'm trying to remember. And they gave you-- I mean, I was getting raises pretty steadily there. And of course, in the early '70s is when they were doing the Affirmative Action, and I believe it was around '74-- oh, I'm not quite sure if I can tell it by the pay changes, they worked me into the engineering, they were trying to get more women up into the upper levels of Hewlett Packard.

Brock: Okay.

Anderson: So I moved out of crystal growing, and into the Engineering Department and started taking nighttime classes. Chemistry, which I don't know why but I am going to someday take another chemistry class to try and get some kind of confidence in chemistry, because I fail at it every time I try and do it. So I got in-- I was going to start into that, and that must have been in like '74 or something like that, because it was then that I was starting to get the feeling that I wanted to come back to Alaska again. So I figured I probably wasn't going to go up into the middle management of Hewlett Packard, so, and then I left.

Brock: Okay, can I ask you just a couple more questions about Hewlett Packard?

Anderson: Mm hm.

Brock: What was it like working with gallium arsenide in the crystal growing? Because it seems like those would be more-- it would be kind of more hazardous materials for that work. Did that make a difference for your--

Anderson: No, honestly, growing and everything, I don't remember much different as far as the procedures. I know the room-- I don't remember that many machines. So really I don't think there really were that many machines in there growing these crystals, and I can remember just keeping them growing and I need to find out how long I really was in there. Because the next one I really remember is when we were going up into the engineering area where we were etching the wafers and under hoods with aqua regia, you know, hydrochloric acid and sulfuric acid mixed together. And that was when the smog that was hanging all over the Bay Area, and there were no scrubbers on the top of the building, so everybody's cars out in the parking lot were getting pitted from the release of all of these toxic things. And I don't remember-- there had to be some kind of fan system going on in the room, but I think I have the pictures that show you, I actually have the ampules that the arsenic was in that they cleaned up and I took with me and I'm going, "Dang, I don't know if anybody-- how much--," I'm sure there was care, I mean, Hewlett Packard was *the* place to work. You didn't say no to Hewlett Packard. I mean, I'm a very strong union person up here, but at that time, you didn't have to talk that. I mean, you got flexible hours or as long as we worked eight hours, we could take two-hour lunches and go bike-riding, which I did every Friday. It was *the* place to work. They had the ranch up in the Santa Cruz Mountains where they had the big picnics every summer, and whatever. I mean, it was the perfect place to work, so I'm assuming that they had the right air quality in the rooms where we were working.

Brock: Yeah.

Anderson: However, I did try to get with a group that was doing research on what this stuff was doing to people. I since after moving back to Alaska, I've had breast cancer three times.

Brock: Oh.

Anderson: One of the things was looking at the toxic mix of the air in the Bay Area, I know there was a group doing that study, and I wrote to them and I never heard back from them, because I wanted to let them know where I worked, or whatever, to see if there was any connection. But I didn't pursue it after I didn't hear back from them. So sure, but yeah, I mean, that was the smog land. That was definitely-- it was horrible to look around and see all the air the way it was. And it was one of the reasons I left. I was not a hot weather person, and this was not the place for me.

Brock: Hmm. Let's see. Just let's see. Would you-- was it again kind of women were the main crystal growers once you got to HP?

Anderson: No, I'm thinking that the area I was at, because I was hired by an engineer, I think we were more in the R&D, so there were definitely a lot of guys there. I'm remembering two or three women who were friends. And I think there were a lot of guys. And I think we did more R&D work, rather than a full production line.

Brock: Got it. And--

Anderson: Because we were really-- yeah, I'm sorry.

Brock: Oh, no, I'm sorry. Please continue.

Anderson: Well, I was just saying that, yeah, I think it was the engineering side of it, I think, I think I wrote in the bio that I— they gave me wafers made into chips. I took them and put a little probe down on each chip, and would turn up the voltage to see what the breakdown voltages were, and jotting the voltage down, just seeing what-- seeing how much they could take. So, yeah, I mean, yeah, so I'm trying to think if it really was making the actual LEDs for calculators, like these that I have, or if I'm in the engineering process of making it do that, or not. It seems kind of weird. I don't think there were enough machines to really be that much production.

Brock: Yeah, well, could have been in a group that had some LEDs, and regular production and were working on new devices and that sort of a thing.

Anderson: Yeah. I know there was a whole wafer cleaning and whatever in another building, because when we moved over to engineering, I went to the building across the parking lot, and definitely there was big crews working on wafers, so whether they were doing other ones, like I mean, they were all part of the same group I was with, though.

Brock: Hm, right. And your engineering job, would you say that was-- that you were involved in kind of testing the devices that were coming out of this kind of smaller production, where you were kind of testing the wafers and processed wafers from the kind of crystal growing-- that resulted from the crystal growing that you had been doing?

Anderson: Yes, I believe that was it. And it was, yeah, it was-- even the R&D, the whole, let's see, Hewlett Packard, the whole department was, I believe called-- I looked at our Christmas card list that I saved when I went over to engineering, and the whole Christmas card list is called "3-5 Materials and Devices" and it's all the people that I worked with, the whole two pages of people. So it was made up of materials manufacture and production, which is where I was, and there's quite a few people on this, so maybe it was a bigger-- looking at this, maybe it was a bigger deal production than I remember. I mean, there are one, two, three, four, five, six, seven, eight, nine, ten, eleven. So there would been 22, 23, 24-- there was 26 in the production, along with some that would be caught in the wafer polishing or whatever, too. And I do recognize names on there. And I definitely there's definitely a mix of women and men. And then engineering, which is where I ended up. And then there was Materials R&D, and then there was Device and Process R&D.

Brock: Hm.

Anderson: So this is a lot of people. And I believe we took, basically had both buildings.

Brock: Right, that would make sense.

Anderson: Yeah.

Brock: Well, so in 1975 was when you decided to move back to Alaska, and I was very interested to see that when you-- back in Alaska that you had studied and trained and became a, I guess, a union electrician. But that you specialized in telephony work, and telephone system installations. I was--

Anderson: Yeah, maybe might have come from my stepfather a little bit, and then one of my brothers was a telephone man in Vietnam. Yeah. I think-- well, here's what actually happened in '74. The winter of '74, I came up to visit my oldest brother who was a wireman, and visited him and his family here for Christmas, and he also was a Business Agent at the union hall here. The IBEW Local 1547 covers the whole state of Alaska. I came up, I went to a Christmas party with him and his wife. The head of the apprenticeship school was at the Christmas party and started talking to me, and said, "You know, we're going to need a lot of people for building the pipeline from Prudhoe Bay to Valdez, and you should consider getting into the apprenticeship program." And now my brother didn't really want me to do it, because he hadn't been around me for years, and didn't know what my work ethic was like, and he certainly didn't want to be a business agent at the union hall having to hear about his sister's screwing up on the job.

Brock: <laughs> Yeah.

Anderson: But I got the bug in my ear, and quite frankly it was a go, I gave two weeks' notice to Hewlett Packard, packed up and jumped in my Toyota Corona and drove it to Seattle and put it on a boat, and I came up. So, and now my brother, this same brother, is-- having been for almost 30 years, the President of IBEW 1547 in Alaska, and he found out that I could do the job, so he didn't have to worry. But I actually went to Prudhoe as a wireman apprentice out of classification. I was on line crews and climbing poles and whatever. I really went into installing telephone business systems, like the multiline business PBXs. That's actually what I ended up doing, but as an apprentice, you had to work on line crews and have the-- and you had a shovel under the one arm, and rake under the other, burying cables in backyards and things like that; it was in the summer.

Brock: <laughs> Right.

Anderson: And so yeah, so it turned out that actually I tell people I started out probably trying to be more of an intellectual desk-type person in college, and I just I ended up using my brains and my brawn, rather than just the brain. I wanted to be out doing stuff. I *have* to be doing stuff.

Brock: Right.

Anderson: So.

Brock: Well, I was curious that with your long association of being in a union and I guess your brother's also involvement and in the union, you know, Silicon Valley is such a famously not a union place, and very deliberately so, you know, back to the '50s or maybe even before. I just wondered if you-- if there were any, I don't know, comparisons or contrasts that you saw between kind of your work experience in Silicon Valley, and then later-- your later work experiences that were union work experiences. If--

Anderson: Yeah, well, like I said, Hewlett Packard, I mean, there, I mean, I wasn't union, I didn't know much about the union, I didn't know that my father had been-- when we moved to Petersburg, he had tried to organize the power

company there. And it didn't work. They didn't want the union. And so I wasn't familiar enough with the union, but Hewlett Packard, like we've been talking, they treated people like you really wanted to be treated as a worker, they knew that the people were making the money for them. They actually had--I got job sharing. We got a check at the end of the year. Like we said, we had the big-- they had beer busts on Friday afternoon out on the balcony. You could have the flexible working hours. I mean, they just trusted you to do what you were doing, because if you wanted a profit-sharing check, you definitely wanted to do good for them. So it just-- you didn't need to unionize. I bought their stock; for every four shares of stock I bought, they bought me one.

Brock: Wow.

Anderson: I came to Alaska with 22 shares of Hewlett Packard stock, because I put the maximum that you could of your check into buying stock. It was like ten percent of your check. And I now have five different companies. I never added another bit to those 22 shares, I have two companies that have 1,400 more shares, I have three other companies that I didn't even know what happened until they-- I hadn't been looking at my statements and found that they had split, I mean, the stock split, and everything, suddenly we're doing-- and they did extremely well. And I still have never done anything with those original 22 shares, and what they've made for me.

But coming to Alaska, and building the pipeline, they didn't want it to be delayed, and the unions were very strong up here. And they got the contracts for doing the pipeline work, and I bless the IBEW, I tell you what, I've been retired-- I retired in 2005, and I'm still getting a pension check that is keeping me comfortable, even though there's no cost of living allowance added to it or anything like that. It's the same amount that I started getting in November of 2005, and they did very well for getting pensions and whatever for the members. So. And this is the last year for my oldest brother to be President. He has finally decided that 78/79 years old that he's put his time in for taking care of everybody else.

Brock: Right. <laughter> Well, I guess I just wanted to ask one last question to just ask you that what stands out the most for you in your work in Silicon Valley, from those years?

Anderson: I don't-- so I'm kind of surprised when I found out about your Museum, I'm just surprised that I really was a part of something that was really getting going. It never dawned on me that I would be anything historical to add to any of it. And I am so sad that in the few times that I've been in San Jose (in the last, well, I guess the last time was 2017, or whatever, you know), I didn't know about your guys until I found-- I started looking through my stuff, I'd been looking at pictures, then found the crystals and all that. Oh, I should just see where Elmat's at or what about Elmat, I mean, that's when I found you guys, and I'm just surprised! I mean, I'm glad I moved down there, I don't regret ever being in the Bay Area, it was a slice of life, and so actually for a few years, probably even more, you know, even when I was working on the pipeline, and doing my apprenticeship, when I got time off, I did come down there and meet up with old friends at Hewlett Packard and go out. So it was a good experience. I'm glad I did it. I wish I knew more on how it actually happened! I need to thank this guy that told me about the job. So yeah, I just-- it was definitely something to be part of, and crystal growing, I hadn't even thought about it for years and years, all the stuff had been put away. And I'm just pleased that you guys are doing something down there, and if there's any way I can add to it, I'd love to.

Brock: Well, thank you so much. I mean, this has been great to talk with you, in general, but also for us who have been reading about and researching about the history of semiconductor electronics, you know, the-- especially early-on in the industry-- well, it still continues today, but especially in the earlier industry, you know, the whole

technology of crystal growing and the kind of mechanical process of it, And the chemical process of it were so vital to how different stories turned out of different companies, and different research. And you know, having read about it so much, it's just great to talk to somebody who was actually there doing it, and to get a little bit better-- to get a better understanding of what it was really like to do it, so I thank you very much.

Anderson: Well, if I can find-- I wrote a letter to the Lois, that lady that grew while I-- I will tell you that her memory is better than mine, because she remembered the blond number one lady, and she worked there. Of course when I left, I went to Hewlett Packard, she still was working at Semimetals, and I so that's why I'm concerned, she was not in really good health when I saw her in 2015, and I've sent so many texts to her and get busy enough, that I wasn't noticing that I wasn't getting answers. And I know that her daughter and grandchildren that are living there, or whatever, and now I try calling her number, she's not there. Somebody else answers back, and I've now written a letter too; I know they owned a condo in San Jose, and I sent that about a week and a half ago, and I have not heard back. So I could pay all white pages online and try to-- although I do have a couple of daughters' name, and the names are coming up, but Lois would be the one to talk to, and she's right there in San Jose. So I'm hoping she's okay, and I'll wait a little bit longer, and then I'll probably pay to get her daughter's number and call up.

Brock: Okay. Well, if you hear, if you do make contact with her, you know, please let us know.

Anderson: I will, I will.

Brock: Thank you. And well, thank you very much again for the interview.

Anderson: Yeah, thank you! I was telling my daughter that I was historical, and she says, "Yep, you are!" <laughter>

Brock: Well, that's something we can all aspire to! Right? It's much better than the alternative!

Anderson: Yeah, definitely, yeah, I've got wrinkles and I earned every one of them. So yeah. <laughter>

Brock: Well, thanks again, Patricia.

Anderson: All right. Well, thank you for calling.

Brock: Yeah, I'll talk to you again soon.

Anderson: Okay, bye-bye.

Brock: Bye.

END OF THE INTERVIEW

