INTERVIEWER: Yeah.

GEAROLD JOHNSON: Five years.

INTERVIEWER: Yeah.

GEAROLD JOHNSON: And it's usually because they die.

INTERVIEWER: Yeah. Yeah. Right. Well, that's a good reason to settle.

GEAROLD JOHNSON: Right. So we've been very happy here. It's very central.

INTERVIEWER: Yeah.

GEAROLD JOHNSON: I walk to the university, as does George.

INTERVIEWER: Yeah. Yeah.

GEAROLD JOHNSON: And nobody knows it's here, which is the other thing.

INTERVIEWER: Oh. You tell people you live on Birky, and they go--

GEAROLD JOHNSON: Where's that? Birky?

INTERVIEWER: So Dan, are we ready to go?

VIDEOGRAPHER: We're ready.

GEAROLD JOHNSON: Would it be better if I were over there because of the sun coming through here?

VIDEOGRAPHER: It might be better for you.

INTERVIEWER: Yeah. It'll be fine either way. But that would be a little better, I think, now that I look at it.

GEAROLD JOHNSON: Sit in my mother-in-law's chair.

INTERVIEWER: I'll move over here. Most of the time, you look at that.
GEAROLD JOHNSON: Oh, yeah. That'll be much better.

INTERVIEWER: Or you look at Dan. He's better looking than I.

GEAROLD JOHNSON: So when do you finish, Dan?

VIDEOGRAPHER: This is my first year, second semester. So I've got two more to go.

GEAROLD JOHNSON: OK.

INTERVIEWER: You remember that journey.

GEAROLD JOHNSON: I remember that journey very well, actually.

INTERVIEWER: Well, I told you when I called, you know the answers to all these questions. But you just don't know the questions. Well, the first question is, give us your full name and date of birth.

GEAROLD JOHNSON: Gearold Robert Johnson And Gearold is Welsh, so it's spelled G-E-A-R-O-L-D.

INTERVIEWER: Yeah.

GEAROLD JOHNSON: January 11, 1940.

INTERVIEWER: 1940.

Where were you born?

GEAROLD JOHNSON: Des Moines, Iowa.

INTERVIEWER: Des Moines, Iowa. And did you grow up in Des Moines?

GEAROLD JOHNSON: I did.

INTERVIEWER: And tell us about your parents and what they did.

GEAROLD JOHNSON: Well, my father was from a small farming community south of Des Moines, Osceola, Iowa. And he left school at 16 and became a welder for Solar Aircraft in Des Moines, which during World War II I think he was one of the first certified titanium welders in the country because they were building turbines at that time. And so he was just a hard-working, blue collar guy.

My mother did graduate from high school. They were married in '38. I was born in '40. Both of them died in 1998, four days apart.
INTERVIEWER: Really?

GEAROLD JOHNSON: Yeah.

INTERVIEWER: Four days apart.

GEAROLD JOHNSON: Yeah.

INTERVIEWER: Do you have siblings?

GEAROLD JOHNSON: I had a brother, six years younger, who was killed in Vietnam. And I have a sister who's 11 years younger who is a postal supervisor in Blue Springs, Missouri.

INTERVIEWER: Blue Springs, Missouri. When you were growing up, what were your hobbies? How did you spend your time?

GEAROLD JOHNSON: I was a model airplane nut. I built and flew fly-by-wire model airplanes. There was no concept of radio control in those days, or I would have probably spent a fortune. But I built airplanes and flew 'em. And it was my desire to become an aeronautical engineer. And then, of course, when I graduated from high school, it was just four months after Sputnik, so I changed to rocket science.

INTERVIEWER: Oh, yeah.

Did you have particular role models in your community that you looked up to?

GEAROLD JOHNSON: It's an interesting question, actually. I had three old maid math teachers in high school. Obviously, they were all single. They were not as old as 15, 16, 17-year-olds think. But they were certainly older than I was. And I think they were probably a very large influence.

My junior math teacher, Beulah Newton, had gotten her Master's degree in math from Purdue. And she was my adviser. In those days, you actually had teachers who were your advisors. And she suggested that if I wanted to become an aeronautical engineer that was a great place that I should go to. And then I took her advice.

INTERVIEWER: Were there people outside you community or outside your school that you admired?

GEAROLD JOHNSON: Well, I read lots. So I was a George Gamow fan. Of course, George Gamow was a professor at the University of Colorado, Boulder. And he wrote a book called One Two Three... Infinity, which was a very influential book in my young science education.

There was certainly a class of people like that, my, I guess I would call them role models. I never met them.
INTERVIEWER: Yeah.

GEAROLD JOHNSON: Only through their written word.

INTERVIEWER: And you mentioned the old maid math teachers. Were there other people that were your mentors?

GEAROLD JOHNSON: I don't really think so, in that sense. I worked. I started working at 11 carrying papers, The Des Moines Register and Tribune. I carried morning papers, which was interesting.

I don't know if you know anything about that newspaper at that time, but The Register was the democratic paper. The Tribune was the republican paper. And they were put out by the same organization, which I thought was interesting.

One came out in the morning. One came out in the afternoon. And they were joint Sunday. And I think I had the largest paper route in the city, which was like 160 papers.

INTERVIEWER: Wow.

GEAROLD JOHNSON: It was four streets, a half a mile long.

INTERVIEWER: That's a lot to carry on a bicycle.

GEAROLD JOHNSON: Yes. There's an interesting story there later on, if you'd like to pursue that, about leaning to drive.

INTERVIEWER: Well, if you have an interesting story, you may tell it at any time.

GEAROLD JOHNSON: Well, the morning and the evening papers weren't so difficult because they weren't so large. But the Sunday paper was a very immense newspaper. And so when they dropped my papers off where my pick-up point was it was usually about two stacks that high. And there was no way that I could really do that.

So my father used to get up every Sunday morning at 4 o'clock. And he would take my papers and drop them off for me at different points down my route so that I would start and carry 'em. Then I would get to another bundle and open that bundle and go on. But he would go home and go to bed, of course. He was just my delivery service, in a sense.

And one Saturday night his brother came to town, and I was 14 at the time. They didn't see each other but every three or four years. And they had a little, probably, too much to drink. And so when I went in at 4 o'clock to wake him up, he said that the keys were on the dresser. And it took me 20 minutes to get the car out of the garage.

INTERVIEWER: You didn't have a license?
GEAROLD JOHNSON: I did not have a license. I didn't even have a learner's permit. And I distributed my own newspapers and then put the car back home and then walked back and delivered the papers. And he never got up after that.

INTERVIEWER: That was what you might call a memorable experience.

GEAROLD JOHNSON: That was a memorable experience.

INTERVIEWER: Were there others? Special ones.

GEAROLD JOHNSON: I'm sure there are many. I'll just have to think about that as we go on, I guess.

INTERVIEWER: OK. Yeah. Where did you go to school? In Des Moines?

GEAROLD JOHNSON: I did go to school in Des Moines.

INTERVIEWER: Elementary and high school?

GEAROLD JOHNSON: Elementary, junior high, and high school, yes. U.S. Grant was the elementary school, Ben Franklin was the junior high, and Teddy Roosevelt was the high school.

INTERVIEWER: Was it a good education, a good experience?

GEAROLD JOHNSON: I think so. My elementary school was very racially diverse. I think there were probably close to 40% black, I would think, at that point in time. But then at the junior high and high school level that dropped off pretty significantly.

INTERVIEWER: What attitude did your mother and father have about school and your going on to school?

GEAROLD JOHNSON: I don't think they ever understood it. My father, when he would introduce me later in life, he would say, this is my son. He went to college and never left.

INTERVIEWER: Yeah. They say people who never got out of school are called teachers.

GEAROLD JOHNSON: Right.

INTERVIEWER: And when you were in high school, you mentioned your desire to be an aeronautical engineer. Did you have a clear vision of where you were going?


INTERVIEWER: And that aeronautical engineering. Was that for a while?
GEAROLD JOHNSON: That was it. it really was. I can tell you another interesting story. I did go to Purdue. By the way, I should probably tell you that, because of World War II, I was a mid-year student, which is relatively unusual. I started school in January. And I graduated from high school in January.

INTERVIEWER: Why World War II?

GEAROLD JOHNSON: Because they've decided that they would aid the transition of kids through school by having two sets going at the same time.

INTERVIEWER: Ah, I see.

GEAROLD JOHNSON: So that I was an Iowa thing. And so I was mid-year. So I used to always have summer break between the two semesters of a year, which is a little strange. But it worked. So I graduated from high school in January, and I started Purdue in January as well. Because I just applied and they accepted me. Colleges and universities are much more open in that regard than the usual public school model.

So I started school at Purdue in January of ’58. And I had worked, I carried papers until I was 15. Then I went to work for a restaurant, was a busboy, fry cook, dishwasher, whatever it took to-- And so, I actually had saved up a rather significant amount of money to go to school, to go to college. And that was my goal.

GEAROLD JOHNSON: My parents were not super supportive of the idea of going to a college or university. And they didn't really understand it.

INTERVIEWER: They didn't object.

GEAROLD JOHNSON: They didn't object.

INTERVIEWER: Didn't understand why.

GEAROLD JOHNSON: That's right. They didn't understand why. And so I completed five semesters at Purdue. And then I ran out of money, in effect. So I hitchhiked to Los Angeles and lived on the beach while I tried to find a job. For Dan, this will sound anachronistic because nobody could do this in this day and age.

Eventually, I responded to an ad at Van de Kamp's Bakery. It was for a data processing position, and they gave you an IBM examination. And I did the exam. And you had an hour to do the exam. It took about six minutes. And I gave it to the woman, and she said, well, you can go outside and sit down. And so I went outside and I sat down.

And about 15 minutes later, she came back. And she said, well, the vice president of finance would like to talk to you. And so I went into a very nice office. Went into his office and sat down.
And he said, you need to go back to college. And I said, well of course I need to go back to college. But I said, I'm out of money, and I've got to work until I can get enough money to go back.

And he said, well, I'd love to hire you, because you could probably take my job in 10 years. And I was just, well, I don't know. He said, so I know if I hire you, you're not going to stay here. You're gonna go. And you should. And I said, yes.

But he says, we gotta find you a job. And he said, well, Capitol Records is kitty-corner across the street, and I know the plant manager there. Why don't I call him and see if there's something that they could use you for? And so, he picked up the phone, and he called them. And the guy said, send him over.

So I went over. And we talked and he talked. And he said, I've got a warehouse full of LP covers for the disc that we press. And we don't know where anything is, we don't know where they are. So every time we press something new, we start buying more covers. We have them printed. And he said, we probably already got 2,000 of 'em out there, but we can't find 'em.

He said, how would you like to inventory that for me? I said, gee, that sounds like fun. And by the way, this was a Friday. And he said, do you object to working over the weekend? And I said, no, not at all. He said, well, why don't you come here at 8 o'clock tomorrow morning and we'll get you started. And so I thought, oh, OK.

My vision of all this was that I was going to show up at 8 o'clock and they were going to open this big building for me and there were going to be thousands of boxes in there. And for the next n months, I was going to have a job. But when I got there, it turns out I had a crew of 30, which they hadn't bothered to tell me.

So I organized these guys. And we alphabetized and reorganized the whole warehouse. And did it in nine hours. So Forrest came up to me at the end of the day and he said, come to work Monday morning. We'll find another job for you.

So I spent nine months at Capitol. Even got to watch a number of recording stars record, such as Frank Sinatra and The Kingston Trio. Good groups like that.

And interestingly-- do you know the Capitol Records building on Hollywood and Vine? It's built like a stack of records with a spindle up through the top?-- Well, that was their logo. And because I was an aeronautical engineer, whenever I would get a memo, I would get that letter head, and then somebody would always draw a rocket exhaust coming out of the bottom of it for me. So that was my thing.

And when I graduated from Purdue, they actually offered me more money to come back to work for them.

INTERVIEWER: Back to Capitol?
GEAROLD JOHNSON: Yeah. But I turned 'em down because I said I had to go become an aeronautical engineer for a little while first.

INTERVIEWER: When did you marry?

GEAROLD JOHNSON: November of ’62.

INTERVIEWER: And your wife?

GEAROLD JOHNSON: She was at the University of Michigan. Another interesting story. I was at Triangle Fraternity. And the young man who lived in the room next to our room I think knew every young woman in the United States. I have never met anybody like him in my life. Still haven't.

But he used to come over to our room, and he would say, I've got a young woman coming in from somewhere-- could've been Wayne State, could've been Ohio State, could've been the University of Kentucky or Valparaiso, wherever-- she needs a date. Which one of you guys is going to take her out? And Joel and I used to flip a coin.

And he came in one night and said there was this girl from Northwestern. And I lost. So my roommate took her out. And I don't know. Three weeks later, he came in and said, I've got a young lady from the University of Michigan who needs a date. And you lost last time, so you get her. Well, interesting, on those two flips of the coin, we both ended up marrying those two young women.

INTERVIEWER: How long have you been married?

GEAROLD JOHNSON: 48 years.

INTERVIEWER: 48. Children?

GEAROLD JOHNSON: Two.

INTERVIEWER: And tell us about them.

GEAROLD JOHNSON: Our son was born just before we left Purdue. I'd have to jump ahead a little bit. I went to work for Boeing after I graduated from Purdue. And my wife-to-be transferred from Michigan to the University of Washington. And then we got married that fall.

And I worked for Boeing for four years. And then I went back to Purdue to do graduate work. And our son was born in ’69. And I left Purdue in ’70 to do a NATO postdoc at the von Karman Institute for Fluid Dynamics in Brussels, Belgium. So our son was born in Lafayette, and he was one years old when we went to Belgium.

Our daughter was born here in ’72. They're both well-educated. Our son did a bachelor's degree at Occidental College in Los Angeles in mathematics, computer science, and international
economics and then an MBA at Cornell University. And he's a banker today in Pasadena, California.

Our daughter, she's a concert violinist. She did an undergraduate degree at Mount Holyoke in violin performance and psychology and biology. And she's done a PhD at NYU in neuroscience. And she's now the acting director of Duke Institute for Brain Sciences at the Duke Medical School.

They each have two kids. So we have four grandchildren, from six to nine months.

INTERVIEWER: Six to nine months.

So you completed your undergraduate degree at Purdue.

GEAROLD JOHNSON: Yes.

INTERVIEWER: But it took quite a while?

GEAROLD JOHNSON: Yes.

INTERVIEWER: Yeah. And how did you pick your major at Purdue. And what was it?

GEAROLD JOHNSON: I was an aeronautical engineer.

INTERVIEWER: From the beginning?

GEAROLD JOHNSON: From the beginning.

INTERVIEWER: Did you do any extracurricular activities at Purdue?

GEAROLD JOHNSON: Extracurricular activities at Purdue. Not really. I guess I was a student, which is what I advise my students to do today, of course. That should be the first name by which they're known is student.

As I said, I as a member of Triangle Fraternity. No sports. No. Nothing particular.

INTERVIEWER: And your bachelor's degree, of course, led right on to you other degrees.

GEAROLD JOHNSON: Yes. Although I switched to mechanical engineering when I went back.

INTERVIEWER: Back to Purdue?

GEAROLD JOHNSON: Purdue, right.

INTERVIEWER: That was after Boeing.
GEAROLD JOHNSON: Right.

INTERVIEWER: So you did your Master's at Purdue.

GEAROLD JOHNSON: Mmm-hmm.

INTERVIEWER: PhD at Purdue?

GEAROLD JOHNSON: Mmm-hmm.

INTERVIEWER: Ah ha. And you finished when?

GEAROLD JOHNSON: I left Purdue in '70.

INTERVIEWER: '70.

GEAROLD JOHNSON: Which was a very bad time.

INTERVIEWER: A bad time?

GEAROLD JOHNSON: Oh, yes. There were no jobs.

INTERVIEWER: Ah. What was your dissertation?

GEAROLD JOHNSON: In fact, it's kind of interesting. I went to Boeing because of the Apollo project to put a man on the moon. Kennedy had fired me up. And I switched from, essentially, being in aeronautical engineering to astronomical engineering, I guess. And I wanted to play some kind of role in landing a man on the moon.

And I did work on the Apollo project while I was at Boeing. And even in 1964, after I'd only been there two years, we knew that we would fulfill the mission of landing a man on the moon before the end of the decade. It was all laid out. It was going to happen in 1969. It appeared there were no major obstacles in our path to do that.

The problem was we had nothing to do after we did that. There was no mandate for anything more. All we were doing was going to land a man on the moon, snub our noses at the Russians, and quickly disappear wherever. And so that led me, in effect, to start trying to decide about my own future, in a sense, because I didn't think I had a future in aerospace at that point.

The aerospace world, those projects require seven to 12-year lead time. And so if you're not doing anything new now, there's going to be a long period of time when you're not doing anything. And you'll probably be out of a job. And Boeing went from 150,000 employees in 1965 to 26,000 in 1971.

INTERVIEWER: Wow.
GEAROLD JOHNSON: In fact, there was a very famous billboard that said, would the last person out of Seattle please turn off the lights? Because people were leaving in such huge numbers. So that's what prompted me to decide to go back to school because there was nothing on the horizon whatsoever.

INTERVIEWER: Your graduate experience was good?

GEAROLD JOHNSON: Oh, yeah. It was very good.

INTERVIEWER: Good advisor?

GEAROLD JOHNSON: I had a great adviser, but he went on sabbatical and kind of dumped me off on his last year. And I'm still not sure I've ever forgiven him for that.

INTERVIEWER: This was the doctoral program?

GEAROLD JOHNSON: Yeah.

INTERVIEWER: Yeah.

GEAROLD JOHNSON: But that's the way of life.

INTERVIEWER: Yeah. How did you hear about CSU?

GEAROLD JOHNSON: Oh. Well, now you're going to get into another story.

INTERVIEWER: Yeah.

GEAROLD JOHNSON: Since there were no jobs in 1970, and, in particular, I decided at that point I really wanted to be an academic. I wanted to teach.

INTERVIEWER: That was a result of your graduate program?

GEAROLD JOHNSON: Yes. Very much. And so I applied for the NATO postdoctoral fellowship to go to Europe.

INTERVIEWER: After the PhD?

GEAROLD JOHNSON: Right. And the lab in Brussels, a very interesting lab. It's a NATO lab. It was established by Theodore von Karman. He was a very, very well-known fluid mechanician following World War II.

And the basis of the organization was that it was a very fine facility for experimental fluid mechanics, which I was not an experimentalist. And they take two postdocs from each NATO country each year. And there were 16 NATO countries, I think. So there were 32 postdocs that
would be there. And they would represent England, France, Germany, Austria, Norway, Spain, all of the NATO countries, US, Canada.

But Iceland never sent anyone. So the US almost always got four or five of these positions, which was probably good for me because I ended up being one of 'em. And so I got this position.

And I had written to the director of the Institute saying that I wanted to continue doing my computational studies, which I had done. But I also really was interested as well, since they were a good physical facility, in trying to do some experimental work which could substantiate the computational stuff that I had done.

Well, my response was, we'd love to have you. And we don't have a computer. And you could get one, or whatever, and get us into that world. So that would be a good thing for you to do. So I was involved with that activity.

And I went there in October of '70. And on January 2 of 1971, Lionel Baldwin, the Dean of Engineering at Colorado State University showed up on sabbatical. And Lionel had become dean at such a young age here that he had missed the opportunity to have a sabbatical. He was-- let's see, '71-- 39 years old.

INTERVIEWER: How old?

GEAROLD JOHNSON: 39.

INTERVIEWER: 39.

GEAROLD JOHNSON: And he'd already been dean since '64. So he had appealed to Ray Chamberlain for special compensation because deans don't get sabbaticals. And he claimed that he had been deprived of a sabbatical. And he was granted one.

And so he came to the von Karman Institute. And to make a long story short, we started working together. And in about April, I guess, he said, what are you going to do when you go back to the US? And I said, look for a job. And he just sort of said, well, I think maybe you should come to Colorado State.

INTERVIEWER: So that was, in effect, your initial interview?

GEAROLD JOHNSON: Yeah. But of course, deans don't hire.

INTERVIEWER: Yeah. Departments hire.

GEAROLD JOHNSON: Departments hire. Right.

INTERVIEWER: So you had an interview when you came, then.

GEAROLD JOHNSON: No.
INTERVIEWER: No?

GEAROLD JOHNSON: They created a position for me in the computer center because Barney Marschner was a very good friend of Lionel's. And so they just made up this position. And then they made me a research associate in the civil engineering department.

Because Lionel's idea was that there's a very good physical fluids group here. Cermak and all were very well known in the fluid mechanics area. But Lionel felt that there was no one who was doing computational fluids within that group. And so his vision for me was that I would integrate computational fluid mechanics into the civil engineering department. Didn't happen. Didn't happen. Didn't happen.

The physical people just didn't believe that computational fluid mechanics would ever amount to anything.

INTERVIEWER: So what did happen?

Well, my second year here, Byron Winn went on sabbatical. And I taught all of his mechanical engineering courses while he was gone. And the ME department decided well, if this guy in the computer center can teach our graduate and undergraduate-level classes, why isn't he on our faculty, in a sense. That's a paraphrase.

INTERVIEWER: So when you first came here, what did you think of the place?

Well, I love the town. And I think the university was appealing. I got to know a lot of the engineering faculty.

I actually got to know a lot of faculty, period. Because one of the jobs that Barney gave me in the computer center was--I don't know if you remember those days or not, Bob. But this was back in the world where there was one computer on the campus. And the computer had to cover its own costs. So the computer center would give money to people who could then spend that money back in at the computer center. It was a very fake game, but one that was done for accounting reasons.

INTERVIEWER: With all the cards at that time.

Oh yeah. Sure. And Barney didn't really like to deal with the deans or the department heads. So he kind of gave me this job of going out and meeting the faculty that were doing computing in those days and ensuring them that we make sure that they had adequate funds from the computer center so that they could do the kinds of research that they wanted, et cetera, et cetera.

So because of that, I met lots of faculty.

INTERVIEWER: You were a salesman.
GEAROLD JOHNSON: Yeah. Sort of.

INTERVIEWER: You talked about the people who were sort of department heads, the people who reported to, Barney and--

GEAROLD JOHNSON: Lionel. --Lionel and Byron Winn. Yeah. Russell Churchill and double E.

INTERVIEWER: Any comments on them?

GEAROLD JOHNSON: I enjoyed all of those people. I enjoyed them all.

INTERVIEWER: They were good to work for.

GEAROLD JOHNSON: Yeah.

INTERVIEWER: Who had the greatest influence on your beginning time at CSU?

GEAROLD JOHNSON: Oh, I think Lionel, by far.

INTERVIEWER: But you didn't come as a faculty member.

GEAROLD JOHNSON: No, I did not.

INTERVIEWER: When did you become a faculty member?

GEAROLD JOHNSON: ’73.

INTERVIEWER: ’73.

GEAROLD JOHNSON: Two years later. Well, 18 months later.

INTERVIEWER: Because you'd moved to mechanical engineering?

GEAROLD JOHNSON: Right.

INTERVIEWER: And what rank did you start at?

GEAROLD JOHNSON: Assistant professor.

INTERVIEWER: Assistant professor. Who was president when you came?

GEAROLD JOHNSON: Chamberlain.

INTERVIEWER: Any thoughts about Ray?
GEAROLD JOHNSON: I liked Ray. One of my first jobs for the university was when the math, statistics, and computer science department broke up into three departments Ray asked me to serve on the committee to hire a chair for computer science. And we went through our list and ultimately hired Barney because nobody would take the job. I think we interviewed seven people off. And they just weren't convinced that Colorado State University was ever going to have a computer science department.

And then, through that, I ended up becoming a faculty member of computer science as well. 'Cause Barney decided he wanted me there too.

INTERVIEWER: How many years did you work at CSU?

GEAROLD JOHNSON: 23.

INTERVIEWER: 23. You retired fairly early, then.

GEAROLD JOHNSON: Well, I took a leave of absence in '94 for a year and then retired in '95. And I went to work as academic vice president of the National Technological University. I always say that every job I have had since 1971 was because of Lionel.

INTERVIEWER: And what positions did you have at CSU during your time?

GEAROLD JOHNSON: Let's see. I was assistant professor in '73 to '76, when I was given tenure and promoted to associate professor. In '78, I went on sabbatical. '79 Lionel asked me to take over the engineering science major. Then in '82, I was promoted to full professor. In '84 I was given the George T. Abell chair, which is really the first funded chair on the campus.

And then in '94, Lionel asked me to come over to NTU. He had retired from CSU in '84 to start NTU. And in '94 he asked me to become his academic vice president.

INTERVIEWER: Does NTU still exist?

GEAROLD JOHNSON: It does.

INTERVIEWER: So you moved--

GEAROLD JOHNSON: Just not in Fort Collins.

INTERVIEWER: Yeah. You moved from research into teaching and then administration with NTU.

GEAROLD JOHNSON: Yes. But it was an unusual administration job. I wouldn't have been an academic vice president at any quote "real" university.

INTERVIEWER: What was so different about it?
GEAROLD JOHNSON: Because there was no concept of dealing with budgets or faculty issues. I had no faculty because the whole of our faculty were really at universities across the country. And they taught for us. I did have 17 department chairs that I worked with, but they were just part-time people as well, in a sense, because they were department chairs in their own universities.

So it was a very unusual administrative position.

INTERVIEWER: Now you started off with this goal of becoming an aeronautical engineer. So that was your first professional goal, in effect.

GEAROLD JOHNSON: Right.

INTERVIEWER: What were your subsequent goals when you came to CSU? Professionally, what did you hope to accomplish?

GEAROLD JOHNSON: Well, I can tell you that I took quite a fork in the road. I was really a modeller, in a sense. My PhD work was in computational fluid dynamics, but it was really modeling. And I was a very early computer user, in that sense. Large computer, the large mainframing kinds of computing.

At CSU, I got involved with the solar program early on with George Lof and did modeling for heating and air conditioning of buildings using solar as the energy source. When I got pulled in, sucked in, pulled in to the computer science department, in effect I was forced to learn more about the underlying world of computing than just becoming a computer user. And essentially, over time, I evolved into a computer scientist, even though I had no formal training.

One of the issues is that, of course, the first computer science departments in the country only came into existence at the end of the '60s. So my education, in some ways, was pre-computer science. I wonder, in my old age, had I been 10 years younger whether I would have been a computer scientist from the very beginning, rather than an aeronautical engineer.

But computing really became more interesting to me than the problems that I was solving. So that was a significant change.

INTERVIEWER: Now when you came to CSU, it was clear that the primary thing you had to do was publish. And how did that go?

GEAROLD JOHNSON: How did that go. Well, let's see, how did that go? I was involved, as I said, with the solar program very early on. '73. I think George came to the civil engineering department in '73. Yeah. '72 or '73. So I had many opportunities, in effect, to publish there.

I got an NSF grant at that point in time to do automatic control development for solar installations. I was still working with Lionel in fluid mechanics. And we published an article in boundary-layer meteorology. I think kind of interesting. I have a very wide range of publications. So the publications were there, in effect.
INTERVIEWER: How many?

GEAROLD JOHNSON: Now, or then?

INTERVIEWER: Total.

GEAROLD JOHNSON: Total. Oh, I think about 180.

INTERVIEWER: 180.

INTERVIEWER: Papers and--

INTERVIEWER: Books?

GEAROLD JOHNSON: Probably the chapters in books. Another maybe 100 reports Yeah. Quite a few.

INTERVIEWER: You satisfied that goal.

GEAROLD JOHNSON: I did.

INTERVIEWER: Publication.

GEAROLD JOHNSON: Right. But the interesting thing about my academic career is there's no place you can put your finger in and say, that's what I did. Because my range-- I published from atmospheric science journals to electrical engineering journals through engineering education through science policy to--

INTERVIEWER: As you look back, were some of those quite significant?

GEAROLD JOHNSON: A few. I guess that's about all you can--

INTERVIEWER: Yeah.

GEAROLD JOHNSON: --hope for. I think a couple were important. Yes.

INTERVIEWER: That you're especially proud of.

GEAROLD JOHNSON: Yes.

INTERVIEWER: Yeah. Did you have professional activities or goals outside of CSU?

GEAROLD JOHNSON: Yes. I did.

INTERVIEWER: And?
GEAROLD JOHNSON: Because of the postdoc in Europe and then our first sabbatical at the University of Kent in Canterbury, I sort of decided that trying to do international work should be an important position of an academic. So I became a founding member of an organization called Euromicro, which was a European equivalent of ACM's microcomputing group here in the US.

I went on to co-found an international conference in 1992, for example, which is called Computing Frontiers, which is a conference that tries to do a couple of very unusual things. One, publish failures because, as an engineer, I very strongly believe we learn more from our mistakes than our successes. And almost no organization will publish articles that don't work. But yet those articles will encourage people not to try those paths again. Or if they do try those paths, to try them in a different way.

So that's been difficult, because it's been contrary to what most professional societies do.

INTERVIEWER: It still exists?

GEAROLD JOHNSON: Still exists.

INTERVIEWER: That's interesting. They publish failures.

GEAROLD JOHNSON: Yes.

INTERVIEWER: When you first came to CSU, you seem to have moved around a lot.

GEAROLD JOHNSON: Yes.

INTERVIEWER: What sort of office and facilities were you provided?

GEAROLD JOHNSON: I don't know I probably had 25 offices in 23 years. Many. I had offices in the engineering building. I had offices in—

It's the one on the oval, the old statistics, math building. Offices in the computer center, an office in computer science. Yeah, I've had a lot of offices.

INTERVIEWER: And what was provided was satisfactory?

GEAROLD JOHNSON: Yeah, I think so.

INTERVIEWER: You had what you needed to do the job you were supposed to do?

GEAROLD JOHNSON: Yeah.

INTERVIEWER: In looking back, what was the campus like when you came?

GEAROLD JOHNSON: Pretty small. I think there were 11,000 students, maybe, something like that. That's a good question. I don't know what the population was, but it was pretty small. The
College of Engineering was quite small. It still is, in some ways. Of the three state engineering schools, it's the smallest.

INTERVIEWER: How has it evolved?

GEAROLD JOHNSON: How has it evolved? Well, I think it's much more scientific today than it was 40 years ago, almost. I think it's more impersonal to the students than it was 40 years ago. We used to advise students. Students now have, quote, "professional advisors" who aren't faculty anymore.

I think education has taken a backseat to research and money. I think that was all in the works back then, but I think we've gone way, way down that road.

INTERVIEWER: Would you have outside activities, community activities when you were--maybe still, or when you were teaching?

GEAROLD JOHNSON: I did coach youth soccer. And that's, other than reading, that's probably the only kinds of outside activities I like to do.

INTERVIEWER: I forgot to ask you, you read Gamow's book, One Two Three Infinity. Did you read a lot in high school?

GEAROLD JOHNSON: Yes.

INTERVIEWER: What sorts of things did you read?

GEAROLD JOHNSON: Mostly science, although I did read a lot, still do.

INTERVIEWER: Reading, as opposed to television.

GEAROLD JOHNSON: Oh, yeah.

INTERVIEWER: Was teaching your primary job when you came to CSU?

GEAROLD JOHNSON: In my view, yes. But I don't-- My whole career revolves around the students. I think that's all any university is about.

INTERVIEWER: Undergraduate teaching?

GEAROLD JOHNSON: Both. The graduate program is different simply because it's more of a mentorship program and direct working one to one. If we can jump ahead a little bit of whatever--I started teaching again a year ago. I co-taught Engineering 180 with Tom Siller, who's the associate dean for academic and student affairs of the College of Engineering. We've written together for many years and so we went off to a conference when the National Academy of Engineering announced its 14 Grand Challenges for engineers from the 21st century.
It was one of these kind of profound moments, because you realize that engineering in a sense has been turned upside down from the 20th century. The 20th-century model for engineering is the individual or the small-group entrepreneur who invents something and that invention has profound societal implications-- the automobile, the television, the integrated circuit, aircraft, whatever.

The 21st century is going to be dominated by solving the societal issues that have come about because of the 20th century inventions. We've got to solve global warming. We've got to solve carbon greenhouse gases. We've got to take a completely different approach to medicine than we've ever done in the past.

So that turnover in a sense means that engineers have got to become a lot more social. They've got understand societal issues-- economics, political science, religion, culture, things that most engineers have absolutely no interest in because it just gets in their way. So we taught this first-year course trying to start the students off on what we think is at least the right track, which is to get them to start thinking about those kinds of things rather than just becoming techie nerds.

INTERVIEWER: Has it been successful?

GEAROLD JOHNSON: It has.

INTERVIEWER: And how do you know?

GEAROLD JOHNSON: Because when the students from our class go to meet their advisors, we get these anecdotal discussions back that they're the most excited engineering students they've ever met. So that's about the only thing I have to go on.

INTERVIEWER: So that really became an objective of your teaching.

GEAROLD JOHNSON: Yes.

INTERVIEWER: This different tack.

GEAROLD JOHNSON: Yes.

INTERVIEWER: But that wasn't the objective when you first came.

GEAROLD JOHNSON: Oh, no.

INTERVIEWER: What was it then?

GEAROLD JOHNSON: I think there are a number of things. One is, engineering has always been a hard program. And you can either throw students out in the middle of the lake and let them swim, or you can kind of guide them and show them how it's done, which takes an awful lot more time than just throwing them out of the boat.
But I've always taken the position that you have to guide and help them to get through what is, in fact, a very difficult program. And they live in a world where they see their friends not doing nearly as much work as they do. And so you have to continue to talk to them and to reinforce them that what they're doing is a good thing and it would pay off.

INTERVIEWER: You taught. What did you learn from them?

GEAROLD JOHNSON: Oh, lots. You learned that-- you relive your own youth in some ways, because they're struggling with issues that you've kind of swept under the rug now, but all of a sudden they come back to you again. I'm working with a senior right now. She's applying for a UNESCO Laura Bush fellowship for the summer.

And she has to write an essay, and all this, and propose a project. And she's been sending me the stuff, and I've been working with her. And just this morning I got this email. She said it's so nice to have a professor who actually is interested in you. That's what you work for, Bob.

INTERVIEWER: So that's a big part of your goal, to really get involved with these students.

GEAROLD JOHNSON: Yes.

INTERVIEWER: How many graduate students have you advised?

GEAROLD JOHNSON: I have 11 PhDs that I produced in 23 years. And probably 65 Master's students, something like that.

INTERVIEWER: When you began, and when you progressed through your career, did your teaching methods change? Did you move from chalk to overheads to slides?

GEAROLD JOHNSON: Death by PowerPoint? No, I never did that. Yes. And it would even be more serious today because of class size. I really love interacting with the students. The freshman class that I taught this fall was 140 students. That class of 1975, when I taught, would have been 18. And that's a whole different class. So, yes. Your teaching method changes.

INTERVIEWER: And how did they change? What's different?

GEAROLD JOHNSON: The students themselves have to be more outgoing to get to you. And so you've got to encourage them to come to you. You've got to encourage them to interact with you. You've got to encourage them to meet you outside of class. I like to scare them and tell them that unless I know your name, you're not going to get an A.

INTERVIEWER: But early on, because class size was small, it was easier to do?

GEAROLD JOHNSON: Much easier, much easier.

INTERVIEWER: You pretty well described your research interests and how they've changed over time, because you were in so many different places.
GEAROLD JOHNSON: Yes.

INTERVIEWER: What about the funding for research, how has that changed?

GEAROLD JOHNSON: Well, I think funding has become much more difficult. The organizations that I used for funding agencies in my young career were, in a sense, places like NSF and maybe DOE and small individual grants, one PI, maybe one or two graduate students. Those are very difficult these days.

And so there's more of an emphasis on big grants today, I think, than in my day.

INTERVIEWER: Has the emphasis in engineering changed in the way you just described? Do you involve the clinical scientist, the economist, in the engineering program?

GEAROLD JOHNSON: No, I don't think so, not yet.

INTERVIEWER: We ought to talk to them but we don't?

GEAROLD JOHNSON: Right. And the faculty that we have right now don't know how to talk to them as well.

INTERVIEWER: You mentioned your international experience in Brussels. Has there been other international--

GEAROLD JOHNSON: Uh-huh. I worked with a group at the Milan Polytechnic in Italy.

INTERVIEWER: Were you there or do you work--

GEAROLD JOHNSON: Yes. I was an advisor to the director general of UNESCO for 10 years, on engineering education. UNESCO's an interesting organization. It's education, science, and culture. And like many scientific organizations, it treats engineering as an applied science, which it most definitely is not.

INTERVIEWER: What's the distinction?

GEAROLD JOHNSON: The distinction is that engineers will use anything they have to, to solve a problem. I tell my freshman students, if voodoo works, use it. You can't wait for science. We have never done that in our history. In many instances we've invented our own science in order to make the advancements that were necessary. That's not science.

The classical definitions are, science is about understanding the universe. And the universe in engineering is about creating a better tomorrow. And those are very different activities. But organizations like the National Academy of Science and UNESCO and these international science bodies always want to categorize engineering as an applied science. Yes, we use science, we use mathematics, we use statistics, we use all their tools for us.
But we use economics, we use sociology, we use psychology, we use voodoo, whatever it takes.

INTERVIEWER: What were the biggest challenges of your first years at CSU?

GEAROLD JOHNSON: Biggest challenges. I don't know. It's kind of interesting. I didn't think about it the way I see young professors thinking about it today. I never even thought about tenure, and promotion, and those kinds of things. They seemed to be things that happened if they happened and didn't happen if they didn't happen.

You shouldn't live your life in pursuit of those kinds of objectives, per se. You become a good professor, you do your teaching, you do your research, you do your publications, that'll take care of itself. I don't think young faculty think that way today.

INTERVIEWER: It's the opposite today?

GEAROLD JOHNSON: Yes.

INTERVIEWER: What were the greatest rewards of your first years, or of your career?

GEAROLD JOHNSON: Commencement. I love commencement. It's a time of happiness and joy. And you see the fruits of your labor.

INTERVIEWER: Did you ever speak at commencement?

GEAROLD JOHNSON: Yes. I did.

INTERVIEWER: For the College of Engineering?

GEAROLD JOHNSON: Yes.

INTERVIEWER: Is there anything that you know now that you wished you'd known when you began?

GEAROLD JOHNSON: Probably everything. That's hard. I mean, sure I think you'd like to think that having the wisdom or the knowledge that you have now would have been nice to have back then, but that's not really true. Because the great joy, in reality, was acquiring it, so-- I don't think so, actually.

INTERVIEWER: You kind of alluded to this, but how has the professorial role changed?

GEAROLD JOHNSON: I don't think it's changed for the better, but that may just be old bones talking. I suppose we always think that things were better.

INTERVIEWER: What was better?
GEAROLD JOHNSON: The faculty life, if you'd like, or whatever. I don't see the same levels of collegiality that I did as a young faculty member. I don't see mentoring of young faculty the way I think at least I got mentored. I think it's just sort of part of the modern world that we live in now that's just sort of faster and less personal in many ways. It's hard to characterize, but it just seems not as pleasant.

INTERVIEWER: Now you said that people should not regard engineering as an applied activity--

GEAROLD JOHNSON: Science.

INTERVIEWER: --exclusively so, an applied science. What do you see as the role of the university in the community or whole world?

GEAROLD JOHNSON: Well that's always been a relatively tough one. In my era as an undergraduate student, one of the things that the university did for me was that it introduced me to a world that I had never seen or been part of. In my family background, I had never been to a play. I had never been to a musical performance. I had never seen a ballet.

I had never seen any of the arts. I didn't know anyone who was an artist or a philosophy or a scientist. And the university in my era did that.

INTERVIEWER: It educated you?

GEAROLD JOHNSON: Yes, it did. And today, because much of that exists in the world of television or the world of a symphony orchestra, even in a town this size-- I don't think Des Moines had a symphony orchestra when I was a child. My cultural pursuit is that I had a library card. That was kind of it.

It was a tremendous awakening, in a sense. I can remember going-- Purdue has this huge hall, it used to vie with Radio City in New York for the largest auditorium in the United States, the Edward C. Elliott Hall of Music. They brought in the Berlin Philharmonic Orchestra. Students, we got tickets for all the stuff. I saw the Canadian National Ballet. I mean, things that blew your mind when you're a farm kid, basically.

INTERVIEWER: What have been the most significant changes you've observed in the University or in this particular one?

GEAROLD JOHNSON: I think the thing that bothers me the most, and the thing that I didn't do with my children-- we worked very hard, consciously, to raise our children to believe that when they were students, that was their job. I think when CSU abandoned students living on campus, in a sense, and when they pushed into the community, I think-- I don't know if any large university survived that mode unscathed in any way, but I think those were tragic mistakes with respect to the community, the educational community.

INTERVIEWER: The campus community?
GEAROLD JOHNSON: Yes, the educational community, campus community. And I think that's the one that hurts me the most. I think the students should be on campus, that the campus should be their life. I think that the university should provide activities for them on that campus.

INTERVIEWER: What changes have you noticed in Fort Collins?

GEAROLD JOHNSON: It's gotten a lot bigger.

INTERVIEWER: Anything you've noticed about the relations between the town and the [UNINTELLIGIBLE] university.

GEAROLD JOHNSON: Well, the one that's been obvious to me all the time I've lived here is that unless you're associated with the university, you will not drive on campus. I think townspeople are scared to death to drive through campus in any sense. It's hard to do, these days. There are a couple of streets, but they won't go there.

INTERVIEWER: They can't park here, though.

GEAROLD JOHNSON: Well, they can't park there, no.

INTERVIEWER: So you learned a lot during your career at CSU. What's the significance of the land grant system?

GEAROLD JOHNSON: Probably less today than it was.

INTERVIEWER: Because--?

GEAROLD JOHNSON: I think the commoditization of education has in many ways taken those original bases of creating schools away. CU Boulder has an engineering school twice the size of Colorado State, for example. In my view of the land grant applied arts idea, if that were true, CU wouldn't even have an engineering school.

INTERVIEWER: Because it's a liberal arts institution?

GEAROLD JOHNSON: Because it's the state fine and liberal arts institution. And of course, we have liberal arts here, too. But it's happened everywhere.

As I said, it's part of the commoditization. When I was a freshman at Purdue, Purdue had 12,000 students, in 1958. 9,000 of them went into graduate engineering schools. It was the largest undergraduate engineering school in the United States. Today the campus has 41,000 students on campus, and 9,000 of them are engineering students.

INTERVIEWER: You said CU's engineering program is bigger, in terms of faculty and students?

GEAROLD JOHNSON: Yes.
INTERVIEWER: What are the biggest challenges you see for the university over the next couple of decades?

GEAROLD JOHNSON: Surviving. No, I don't really think so. I think money is going to be. The numbers are incredible, the notion that every mechanical engineering class offered now has a minimum of 100 students in it.

INTERVIEWER: Because--?

GEAROLD JOHNSON: Because there are not enough faculty, and there are too many students for the faculty that they have. It's a horrible system in the sense that it's all lockstep now, because we can only offer some classes in the fall, some classes in the spring. A student flunks a class and they're screwed for a year. Because that class doesn't come around for--

INTERVIEWER: Required?

GEAROLD JOHNSON: --12 more months, required classes.

INTERVIEWER: And why the few faculty?

GEAROLD JOHNSON: Why few faculty? Because the budget situation's not very good.

INTERVIEWER: And do you see that changing?

GEAROLD JOHNSON: No.

INTERVIEWER: So that might threaten the survival of the program, or the whole university?

GEAROLD JOHNSON: I don't think it threatens the survival of the university. But I think it just continues this huge change of larger and larger classes, fewer real faculty, more adjuncts, more part-time instructors.

INTERVIEWER: And given all of that, does the self-definition or the perceived role of the university change?

GEAROLD JOHNSON: Yeah, it has, don't you think? I think it's become a business.

INTERVIEWER: I get to ask the questions.

GEAROLD JOHNSON: Oh, sorry. I think it's become a business.

INTERVIEWER: And that's not good?

GEAROLD JOHNSON: I don't know. I struggle with that.

INTERVIEWER: What's the evidence that it's become a business?
GEAROLD JOHNSON: What's the evidence? It's a bureaucratic organization. The College of Engineering, when I was an assistant professor, had a dean, an associate dean for research, [? Daryl Simons, ?] an associate dean for academic affairs, two secretaries, and an accountant who managed the research grants, the finances for research.

I don't know today, but I would guess the administrative staff of the College of Engineering is 35 or 40. They have editors of publications, they have a whole development office of four people. It just goes on and on and on and on. It's a bureaucracy. We're counting paper clips. We've forgotten that our mission is to educate young people.

INTERVIEWER: So bureaucracy is one bit of evidence. Is there any other?

GEAROLD JOHNSON: Is there any other? Yeah, all you hear people talk about is money. Nobody ever talks about the quality of education. Nobody ever talks about-- Every department has a professional adviser in the College of Engineering. Faculty don't advise students anymore. They just get in your way, having all those students have to sign up outside your door.

INTERVIEWER: Get in your way? What's your way? How do they get in the way?

GEAROLD JOHNSON: What, the students? Because they're in the way of the research, and getting money, and writing proposals. Yeah.

INTERVIEWER: But you're not completely negative on these cases.

GEAROLD JOHNSON: Oh, no. I'm not completely negative, not at all. I think it is a great program. It's a great education for the students. They just get short shrift. They could have such a better experience. But that's probably true across the campus. I doubt that's an engineering phenomenon. I think students aren't the primary mission of the university.

INTERVIEWER: And they ought to be?

GEAROLD JOHNSON: And they ought to be.

INTERVIEWER: And if you were president, how would you make that happen?

GEAROLD JOHNSON: Oh, god, I don't know.

INTERVIEWER: Do you have any other comments you'd like to offer, Gerry?

GEAROLD JOHNSON: I should end on a happy note after all the cynicism. It's been a great career. I'm still involved. I came back. I retired from NTU in 2002. And as my wife says, I've continued to flunk retirement over and over and over again. I taught a year ago, and then I taught this fall.

INTERVIEWER: Do you volunteer?
GEAROLD JOHNSON: I volunteer.

INTERVIEWER: They don't ask you, really?

GEAROLD JOHNSON: No, but that's kind of changing, in a sense. I volunteered this fall to take on two senior design projects within Mechanical Engineering. MEs have a practicum, a year-long practicum. It's a huge time drain on faculty, because you work with a group of four or five students over a one-year time period on the development of something. I volunteered to take on two groups, so I've got two of the 23.

INTERVIEWER: You're essentially an adjunct?

GEAROLD JOHNSON: Well, I'm paid.

INTERVIEWER: Handsomely.

GEAROLD JOHNSON: Yeah, I can tell. My wife now tells people that for the first time in my life, I am not overpaid for what I do.

Yeah, and I've got two honors theses that I'm supervising. But, because I'm around, even though I don't have an office, the department head in ME did ask me to serve on a search committee for a new faculty member, so yes, that's kind of a change. That's the first time that's happened.

But maybe that's what we should do. Maybe that's the role for emeritus faculty, to participate as long as we can. Because we know a lot. We've seen everything that can probably happen.

INTERVIEWER: And you're inexpensive.

GEAROLD JOHNSON: And we are cheap.

INTERVIEWER: I like "inexpensive."

You like inexpensive better? Yeah, well. But it's good. And it gets me back working with students. That's what I love.

INTERVIEWER: Thank you.

GEAROLD JOHNSON: You're welcome.

INTERVIEWER: It's been very interesting, as have all of these.

GEAROLD JOHNSON: I imagine. Who have you done this-- I know you've done it with Perry. Perry Ragouzis is a very good friend of mine.

INTERVIEWER: We did George. I've got a whole list of people that we've talked to, down here someplace. Bill Liley , Bob Phemister, Howard Stonaker.
GEAROLD JOHNSON: He must have been an interesting-- He saw a lot. How about Judd?

INTERVIEWER: Yep, I've done Judd. And Rod Skogerboe, Wayne Viney. You know [? Rod Storey. ?]

GEAROLD JOHNSON: No.

INTERVIEWER: You don't? Well, he's in a wheelchair, has been for years.