

William H. Douglas, D.D.S., Ph.D.
Narrator

Lauren E. Klaffke
Interviewer

**ACADEMIC HEALTH CENTER
ORAL HISTORY PROJECT**

UNIVERSITY OF MINNESOTA

ACADEMIC HEALTH CENTER ORAL HISTORY PROJECT

In 1970, the University of Minnesota's previously autonomous College of Pharmacy and School of Dentistry were reorganized, together with the Schools of Nursing, Medicine, and Public Health, and the University Hospitals, into a centrally organized and administered Academic Health Center (AHC). The university's College of Veterinary Medicine was also closely aligned with the AHC at this time, becoming formally incorporated into the AHC in 1985.

The development of the AHC made possible the coordination and integration of the education and training of the health care professions and was part of a national trend which saw academic health centers emerge as the dominant institution in American health care in the last third of the 20th century. AHCs became not only the primary sites of health care education, but also critical sites of health sciences research and health care delivery.

The University of Minnesota's Academic Health Center Oral History Project preserves the personal stories of key individuals who were involved with the formation of the university's Academic Health Center, served in leadership roles, or have specific insights into the institution's history. By bringing together a representative group of figures in the history of the University of Minnesota's AHC, this project provides compelling documentation of recent developments in the history of American health care education, practice, and policy.

Biographical Sketch

Dr. William Douglas was born and raised in Belfast, Ireland. He attended Queens University, earning a bachelor's and doctorate (1965) in chemistry. He became interested in dental materials and subsequently attended the dental school at Guy's Hospital in London, graduating in 1971. He completed an internship at Birmingham Dental School and became an assistant professor at Cardiff in South Wales. He completed a sabbatical year at the University of Michigan's Dental School. He was recruited to the University of Minnesota's School of Dentistry in 1978 as professor and director of the Biomaterials Program. After years of expansion, Dr. Douglas created the Minnesota Dental Research Center for Biomaterials and Biomechanics (MDRCBB) in 1990. He retired in 2006.

Interview Abstract

Dr. Douglas begins his interview by describing his early life, education, and the initial trajectory of his career. He discusses building and funding the Biomaterials Program at the University of Minnesota, the clinical applications of the Program's research, and the creation of the Minnesota dental Research Center for Biomaterials and Biomechanics (MDRCBB) in 1990. As part of this discussion, Dr. Douglas reflects on collaboration between the Biomaterials Program and the basic and applied science departments across the University as well as the program's work with industry. He also discusses the following topics: Dr. Richard Oliver's tenure as dean of the School; manpower issues; his work with Dr. Ralph DeLong; the creation and functions of the artificial mouth; the growing use of computing and modeling in the Program's research; changes in technology; various projects in which the Program participated; strategic planning and Ken Keller's Commitment to Focus; Dr. Richard Elzay's tenure as dean; retrenchment within the School; Dr. Michael Till's tenure as dean; and his experiences with the Minnesota Dental Association and the State Legislature. He concludes with a brief reflection on the work of his graduate students.

Interview with Doctor William H. Douglas

Interviewed by Lauren E. Klaffke

**Interviewed for the Academic Health Center, University of Minnesota
Oral History Project**

Interviewed in Moos Tower, University Campus

Interviewed on May 13, 2013

William Douglas	- WD
Maria Pintado	- MP
Ralph DeLong	- RD
Lauren Klaffke	- LK

LK: This is Lauren Klaffke. I'm here today on May 13, 2013, with Doctor William Douglas in Moos Tower.

Thank you for meeting with me today, Doctor Douglas.

WD: You're welcome.

LK: I wanted to get started and talk a little bit about your background. Can you tell me a little bit about where you were born and raised and your early education?

WD: Okay. I was born and raised in Northern Ireland in Belfast. I went to Queens University, and I did a degree in chemistry. Then, I took a Ph.D. in chemistry. I got that in 1965.

During the Ph.D., I had what you might call a teaching assistantship, teaching dental materials to dental students. Then, I got very interested in the subject and after I finished the chemistry degree, I went to dental school at Guy's Hospital in London. I was there for four years, four years and a bit. I graduated in 1971 with the dental degree.

Then I did what is called a house job, which is called an internship here, in Birmingham Dental School. Then, I went as assistant lecturer, which is similar to an assistant professorship, in the dental school in Cardiff in South Wales. I did six sessions a week in clinical practice. That's three days. Half a day is a session. At the same time, I did some research and then taught dental materials to the dental students.

Then, in 1977, I had a year's sabbatical in the dental school at Ann Arbor, Michigan. I'm trying to remember the mentorship...of Doctor Bob [Robert G.] Craig, who was a leading researcher in the field of dental materials. I'd only gone there to get my BTA, "Been to America."

LK: [laughter]

WD: And then, I was going to come back at the end of school and then just go on in a normal academic career. But, while I was there, I liked it a lot. Bob Craig and I got on very well. He offered me a job but it was only part time. The rest would have been clinical practice.

I also applied for a job in Minnesota here, which was a full time academic position. I accepted that and I came here in September 1978. There was no program in dental materials for dental students at that time. It was what was called self-taught. So I initiated the program and, also, I started some research activities.

I noticed that there was a company down the road called 3M. They turned out to be a very large manufacturer of dental materials and other materials that are used in chair side practice. I made a contact there with a man called Harvey Anderson, Harvey L. Anderson. We got on very well, and we started to do collaborative research. Eventually, they started to fund our research program. That was around something like, let's say, 1981, 1982. That program began to grow slowly. It was a two-way thing, because although I could offer them a lot in terms of research, I also got from them not just budgetary support but, also, I got a lot of knowledge about the broader field of dental materials and what was really needed. So it was a really a two-way street of information.

I was also going for NIH [National Institutes of Health] funding at that time. I got my first RO1 [NIH Research Project Grant] in 1984. It went for four years, until 1988. In all, I had thirteen years of NIH funding.

LK: Mmm.

WD: In parallel, the industrial contact increased dramatically. In, I think it was 1989, I was given an endowed chair by 3M in the name of the previously mentioned Harvey L. Anderson. I'm not sure if it still exists today. A half a million dollars was the deposited and it has grown, of course. I'm professor emeritus and retired. The current occupant of that chair is Doctor Alex Fok. He is now my successor as director of our Center. Our center has got a very long name, I'm afraid.

[laughter]

WD: I've often been asked why isn't it shorter. It's called Minnesota Dental Research Center for Biomaterials and Biomechanics, professionally known as MDRCBB. That was founded in 1990.

LK: Okay.

WD: One of the founding members was 3M Dental Products. They funded 1.25 million dollars over five years. So that combined with our other activities meant that we could now grow in terms of staff.

The two first people who joined me were Miss Maria Pintado, and you know a lot about her, and, then, very soon after, was Doctor Ralph DeLong. Doctor DeLong is now chair of the Department of Restorative Sciences. He's remained a close colleague all those years and Maria has, as well. We did a lot of things together.

One of the things that we did together, which proved very good, is we came up with something called an artificial mouth.

LK: Yes.

WD: In the area in which I'm involved, restorative dentistry of teeth, the wear of teeth, how they wear down, and particularly the wear of materials that are meant to be restorative materials, is of first importance. Even though there have been all other kinds of developments in dentistry, the need for restorative materials that wear at the same rate as enamel has never gone away. It's been very important. To this day, it's one of the main things, not the only thing, but one of the main things that we do. Any time a manufacturer makes a change in a formulation, we must prove the wear properties are maintained or improved.

I also enjoyed teaching a lot. I got the Instructor of the Year award three times. Maria is also a star, by the way, but she can tell you. They love her. I can't understand it. There you go.

In the research side, what we always wanted to be known for was coming out with what you might call good evaluative technologies. How can you tell when something is going to work or it will not work in clinical experience?

Now, you can do a clinical study. But, if it's a new material, you've got ethical problems. It takes forever. It's very hard to measure. We tried in here to develop clinically relevant laboratory tests. We called it an artificial mouth. But not just that, we have a lot of other measurement tools: trying to measure the fracture strength, and particularly shrinkage of materials. Materials shrink and then they fail and you get recurrent caries. We have a whole list of things that are evaluative. We want to be known for that. If you have something, we can tell you what the chances are that it will work or won't work. In that way, people want to come and say, "I have this thing. Do you think it will work?" Sometimes, you give them bad news. Sometimes, you give them good news. But we always give them the truth.

LK: Did you develop a lot of these measurements?

WD: Oh, yes, sure...bringing things together, you know, and in new and different ways. Alex Fok, he's followed that tradition and Doctor DeLong, too.

LK: In developing these measurements—I know that you have a chemistry background and Doctor DeLong has a physics background—did you do a lot of other collaborative work with engineering?

WD: Yes. Now, this is where I think Alex has succeeded. One of the big things that I think the AHC [Academic Health Center] had to learn to do was to cross Washington Avenue. All right?

LK: [laughter]

WD: The trouble is language. They speak different languages. Biologists speak a certain language. They invent words to mean things. Engineers do the same. But they had to learn to speak the same language. You had to spend some time learning their language. I think that's, particularly with Alex more than me, been solved now, because he's primarily an engineer.

LK: Okay. He has a background in engineering?

WD: He was an engineer full time. That's what he did for a living.

LK: Is he a dentist, as well?

WD: No. But he started to work with dentists and he liked it. I met him in Dublin.

LK: Hmm.

WD: I knew I would have a sales job here in the Dental School—because he wasn't a dentist.

It's not like building a bridge in civil or mechanical engineering. The structures that we build are sitting on teeth that are alive—that means that there are other considerations. It's. Ooof.

Funny thing... I remember once I was talking to an engineer. Do you know orthodontics? Well, when you put a force on a tooth, it will move. That's how orthodontics works.

LK: Oh, yes, yes.

WD: But, when you put too high a force, it stops.

LK: Ohhh.

WD: It just becomes immobile; it won't move any more. If you're an engineer, you think, if I push down it will go that far. If I push harder, it will go even further. I'll push harder. No. If you push any harder, it won't go any more. That's because it has cells and the cells eat away the bone. If you push too hard, you kill the cells. You can't move any more. It's a little more subtle than engineering can visualize.

LK: Yes. That's fascinating. I had no idea.

WD: There's this mutual education. We also have to learn their stuff, as well, so Alex is a super intellectual bridge in that connection.

LK: I wanted to back track a little bit and talk about Harvey Anderson.

WD: Oh, yes.

LK: Did he have a dental background? Was he a dentist?

WD: No, he wasn't. He was a chemical engineer. I think he may have even graduated here.

LK: Oh, okay.

WD: He's deceased now. He and I hit it off. So he was a big advocate.

We have very deep penetration inside 3M now, a lot, a big one. They're a founding member and so on. A lot of what we do, we do in collaboration with them. But we always maintain our independence. If we have to tell them bad news, we tell them bad news.

LK: Did you meet him just through contacting 3M?

WD: Oh, now, I've got another name to get. Ohhh. There was another guy here who occasionally came. There was no program here before I came.

LK: Right.

WD: But the minute I came, he was always trying to get a contact going and, one day, he set up an appointment at the Improper Fraction. Have you ever heard of the Improper Fraction?

LK: No.

WD: It's a pub, actually.

LK: Ohh!

WD: Hey, Ralph. Ralphie. What's the name of the Improper Fraction now? Remember the Improper Fraction? You don't remember? How long have you been at the U? [chuckles] Do you remember the Improper Fraction?

RD: I remember the name.

WD: Tell me some stuff along there. It's a pub.

LK: Is it Stubb and Herb's now?

WD: No. The other side of the street. There's a garage here. There's a street and, then, there's a restaurant.

LK: Did it become Chipotle?

WD: No, not that far. Take this. Ralph, we're very disappointed in you. Good thing you're not having an interview.

[chuckles]

WD: Here's the street, right? Washington Avenue. There's a street here, I can't remember. There's a garage here. There are all these little shops. Then there's Harvard Street there. There's this street and this restaurant and it has a sitting out area there.

MP: Sally's [Saloon and Eatery, 712 Washington Avenue, Minneapolis, Minnesota]. Sally's right now.

WD: Is that Sally's?

MP: Right now.

WD: Washington.

MP: Yes. Washington Avenue before the bank?

WD: Right here. Not there. Here. And the bank is here. Then, you've got Oak Street here.

LK: Okay.

WD: Then, Stub's [Stub and Herb's] is there.

MP: That's Sally's. That has to be Sally's.

WD: Okay. That used to be called the Improper Fraction.

LK: Okay. [chuckles]

WD: It was a cool name.

LK: Yes.

WD: Then it went to Sally's. What does that do for you?

LK: [laughter]

WD: Anyway, they set up this appointment there. He said, "All right. I'd like to come once a month." He came once a month and we did some consulting together and talked about ideas and, then, it was once a week. Then, it went down and we needed some funding about 15 K [\$15,000]. Then it went down and the next thing, you had a million. We had a center. So, it just worked.

LK: When you came in, you said there wasn't a biomaterials program. But I know that they had recently moved into the new building. So like what was set up for you and what did you have to...?

WD: Here?

LK: Yes.

WD: See these? This used to be audiovisual and so on.

LK: Oh, okay.

WD: I had these labs here, from here to the end. Now, we've got just under half a floor now.

LK: Oh, wow!

WD: It's got a head count of twenty people.

LK: Right.

I read in Mellor Holland's history that it was Doctor [Richard] Oliver who recruited you?

WD: Yes. Yes, that's correct. He was a great support. He was the reason the 3M thing got going too. You need the dean behind it. If you don't get administrative support, life becomes very difficult. In those days, you see, it wasn't kosher to work with industry.

LK: Really?

WD: Oh, no, no, no. You didn't do that. You might be taken. You might be influenced. You had to have a fairly independent spirit to do that. But, it was too obvious for me. They were huge and they had a global reach. Well, I wasn't going to sit by and say, "No."

LK: [chuckles]

WD: But, people asked questions about it.

LK: Really? Ethical questions?

WD: Well, they would say, "How can you do that?" Nowadays, of course, it's everything. Let's all get together. That's recent, really recent.

LK: Hmm. Would you say in the 1990s?

WD: By the 1990s, it was going okay, yes. But in the 1980s and the late 1970s, no. There was still enough money coming from NIH where you didn't need to do that. So the very, very proper people only went to NIH, didn't go to industry or industry didn't come to you. You might be tempted. Actually, in all those years, I've never had that leveled against us.

LK: Really? That's great.

WD: No one has ever said it, and I was always asked that question.

I've got a very good friend who's an excellent prosthodontist. He's at USC [University of Southern California]. He does a lot of speaking. His name is Pascal Magne. He said to me one time, "Bill, I go speaking everywhere." He always mentions my name because he insists I'm his mentor. He said, "All the places I've gone, no one has ever criticized you and what you do with industry. How do you manage that?" It's quite difficult to do it. You manage it by not touting their materials, or doing lectures for and on behalf of them. If people want to say something, they have to prove it. It's never bounced back on me.

LK: That's great. Like you said earlier, you're honest.

WD: Well...sometimes you tell them bad news.

[laughter]

LK: Could you talk a little bit about how Richard Oliver recruited you? You were at Michigan.

WD: Right.

LK: Did he hear that you were there and met with you?

WD: I'm trying to remember that. This was May 1978. He was looking for someone and they'd been trying to fill this position for a long time and couldn't do it.

There are two theories. Go to a place that's highly developed with a lot of support and a lot of other things. So why would you go to this place where there was not yet developed? Why would you do that? The reason you would do that is that anything you did, you did it. If you go in to another place that's stuffed full of stars, you're just one of many. That's right?

LK: Yes.

WD: Two approaches. What looks like a difficulty can actually give you much more space. You can start to work on your own and shape it the way you think it should be. It's hard to shape something that's already there.

But there were other opportunities. There was one in Florida. I liked Dr. Oliver, actually. He had me stay at his house and brought me out twice.

LK: Oh, wow.

WD: I applied for it. I hit it off with him. That's the other thing...when a dean recruits you, you're his man. It doesn't help him if you fail. He's going to support you to try and make it. He was supportive all the way along. So all the "stars" were in alignment.

LK: And he had just become dean.

WD: Right.

LK: Was he doing a lot of restructuring?

WD: He was. Those were the big... Up to 1976, money was no object.

LK: Right.

WD: I mean this place was luxurious. Unbelievable. Practically every floor in Moos Tower was dental. We had vast real estate. You still see remnants of where money was no object.

But in the mid 1977, 1978, things began to clamp down. First of all, we were pumping out 150 dentists a year.

LK: Right.

WD: So you had a mass of men. If you want to kill a profession, just produce too much. We had people working from storefronts.

LK: Wow.

WD: It was over-manned. But, then, you had a thing called capitation. The more heads you took, the more money you got from the Federal Government. Then, they stopped. So you're stuck with all this faculty, all this real estate and the money is drying up. It was retrenchment after retrenchment. Year after year after year, you cut the budget. It was really painful.

LK: Yes.

WD: And he had to deal with that.

LK: Do you want me to pause it?

WD: Just for a minute.

LK: Okay.

[break in the interview]

LK: I also had been reading that a problem was getting dentists out of the city areas and into the rural areas.

WD: Right. That's a real problem. Fewer people want to live out State.

LK: Yes.

WD: I understand that. I might like to live in the country, especially if your hobbies are countrified—but apparently not.

LK: [chuckles]

WD: Now, we have outstate clinics. We have one at Hibbing. We've got one, I think, in mid state. I think we've got three of them now. So they will get a feeling for what it's like not being in an academic structure all the time.

LK: I wanted to ask a little bit more about 3M. I had read that early on you had been working with a company called MTS [Systems Corporation].

WD: Oh, yes.

LK: That's where you had seen the servo hydraulic testing machine.

WD: Right, right. I wasn't familiar with them. So when I came here, Dean Oliver said to me, "What would you need?" Well, the first thing you need is some sort of testing machine and I asked for a very traditional one, which is called Instron machine.

LK: Okay.

WD: I was actually still in the UK [United Kingdom] when this happened. There's the company here called MTS which made a similar thing called servo hydraulics. When I saw what it could do, I changed my bid. Also, once again, 3M's there and MTS is here down the street. Everything had MTS on it. They're a Minnesota company and they make really good stuff. So to build the artificial mouth, we took their basic machine and modified it. Then, they gave us a small grant to get started with. So they were very helpful with this. We've outgrown them a bit now. In the early days, they were important.

LK: How did you hear about the machine?

WD: When they saw the bid for an Instron, they put in a bid. I thought, what's this? I had a look at it, and I saw it was a good deal. I thought there are other things I can do with this.

LK: [laughter]

WD: Some machines you can't do much with it. You're stuck with it. If you look in our labs there, you'll see... They're all artificial mouths. We just change the wiring on them. Ralph is good at that [Doctor DeLong].

LK: Was it seeing the machine that gave you the idea that began the artificial mouth?

WD: Right, seeing what it could do. It could do compression and tension. It could go through zero. I can show you. It's driven by oil. It's called an actuator. It goes up and down. You've got control of it. But I wasn't familiar with Servo hydraulics, because I was never an engineering student.

LK: Right.

WD: But I knew it the minute I saw it.

LK: When you got the machine, is that when you started crossing Washington Avenue or...?

WD: I think not just at that point.

We had to sell the idea of an artificial mouth. Doctor DeLong, by the way, was very important at this point. The whole idea that you could make a machine chew! But the machine is all steel and what have you. But can you do it? The answer is, you can. It's

too complicated to go into now. You can teach the actuator to move the way your jaw moves. That's what we taught it.

LK: Okay.

WD: We got the physiological information from biologists, so we knew what all the force profiles looked like and, then, had to teach the machine to do the same thing, which is what we do. In fact, we had a meeting this morning because we want to build a four station artificial mouth.

LK: Oh, wow.

Doctor DeLong a dental student here, as well.

WD: Yes.

LK: Did you teach him?

WD: No. He was just before my time, or I would have. He was a physicist originally and, then, took up dentistry and became a prosthodontist. When I met him, I knew his background. I persuaded him to start working with me and he came over as a research associate. Now, he's chair of the department. There you go—rags to riches!

LK: Yes. It sounds like your background in chemistry and his background in physics complimented each other.

WD: Yes. Right.

LK: What I had also run across is that there wasn't a biomaterials program here but some other professors had been working in biomaterials.

WD: Yes there were a number of people before me, Doctor John Wakley, Doctor James Jensen, and Doctor Anna Hampel.

LK: Then, Arthur John Lewis ?

WD: Yes, he was in Australia, but he was also before my time. I overlapped with Jensen and I overlapped with Doctor Anna Hampel. In fact, Doctor Hampel joined me in teaching.

LK: In biomaterials...

WD: That must have been 1980 maybe, something like that, maybe 1981. I don't know.

There were changes. We had all of this faculty, right? All of a sudden, we were taking in seventy-five students. People started to get moving around.

LK: When the student number was downgraded, were any faculty let go?

WD: Not many.

LK: You mentioned that you had a four-year NIH grant and thirteen years total of NIH funding. Was that all for the artificial mouth?

WD: In a way. The first NIH grant was for the artificial mouth. Doctor DeLong was co-investigator on that. The second one was actually the role of lubrication of teeth. We had two four-years of that. Actually, it all worked out somehow to thirteen years of NIH support. For that, we used the artificial mouth, of course. We would take various materials and Doctor Ernest Reeh, was the grad student on that at the time. He's now a practicing endodontist. We had eight years of funding on that one—actually, it must have been nine. Yes, it was two fives and a three. Somehow, it adds up to thirteen, because those were five-year projects.

LK: Okay.

WD: We got some publications out of that. That was a very useful time. You're always learning about teeth, how they meet, how they touch, how they wear, how they lubricate, how you chew, chewing efficiency, all those. Those were not part of the dental curriculum. Nobody was asking those questions. That's what we bring to the party.

LK: Would you say that your work is more influential in sort of creating new materials for filling cavities and doing implants and that sort of thing?

WD: Yes. It's influential in that. What we really wanted to do was to be good at clinically simulated evaluation. It's very easy. You can put something in a machine and break it. Oh, you think this is so strong it will hold a battleship. You can put it inside your mouth and you can chew out in six months. So the question is what kind of challenge does the material meet in your mouth? Can you replicate that in the lab? That's what we try to do. That's where most of our kudos comes from.

LK: Okay. Okay.

With having this artificial mouth that's simulating clinically what's going on, do you do any clinical work as well or were you mostly doing research in the lab?

WD: It was mostly lab research. We did get involved, though, in laboratory measurements of clinical research. For instance, we worked with Gillette. They had an oral hygiene system. They wanted to be sure if it worked. So what we got were impressions of the gums as the treatment went on. Then, we measured the swelling, the recession, and the changes in the gums in the lab. So we would get impressions from the clinic. Then, we could do laboratory measurements on those. Clinical measurements are what it's all about. That's the big problem. How do you measure something in the

mouth? You can have a look and say, "That's nice. That's A. We'll give that one a B, maybe a C." But it's too rough and you have to go on forever. You need to be able to measure carefully. That's our ticket.

LK: It sounds like you really bridged that gap between research and clinical work.

WD: Right. We wanted to be in there. That was the idea. Another way you can do it is you can take collected clinical information that's out there where big studies are. Then, you can do the same experiment in the lab using the same material and, then, try to do a calibration. You calibrate your instrumentation. So you've got two ways of doing it. You can collect the data and say, "Okay, how far am I from it and what factors do I have to multiply to get that answer?" or you actually get the data from the clinic. We have all these measurement things. These instruments here will measure profiles. Have your gums receded? I can tell you to a tenth of a millimeter. So you can get that detailed information. That way, you get the answer sooner and you do fewer patients. To get a good periodontal study on gingival recession, you need about 100 patients and you need to do it for a couple of years. We did it on ten patients over a period of six months and we could show what was happening. It was hard to do at our end and easy to do at their end. All right? So we saved them a lot. We got better and better at being able to measure data that's derived from the clinic. You're measuring it, and this is what you saw. This is what you have.

Have they showed you any stuff?

LK: Maria showed me some of the artificial mouth.

WD: Did she show you all the fancy graphics?

LK: I don't remember. It's been a while.

Did most of your research then surround the artificial mouth or did you branch out from that?

WD: Most of it. Even to this day, it's one of the main things.

One of the things that's happened over time—computer simulation has taken over more and more. Now, it's at least half of what we do.

LK: Oh, wow.

WD: We need to try to simulate everything. We had somebody called Anthony Versluis. He's a Dutchman, as you can imagine.

[chuckles]

WD: He was good at a thing called finite element. We used to model a lot of things. We tried to model wear in the computer. Sometimes, you would get data and you had a model. Then, you'd feed your data into the model and say, "Tell me what will happen if I keep going," or the forces would just tell me what it would do. Alex, he's a modeler. That's what he does. Anything gets modeled. You name it; it gets modeled. Tooth brush. Tooth brush bending. Wear. Bending of teeth. Anything. Just put it in the computer and tell it certain things. Then, they ask it, "What will it do if I do this?" "What will happen if I did that?" The thing about that is it makes much more use of your data. If you've got a bunch of data, you can look at that and say, "Okay, it tells me this," or "It tells me that." Suppose you had a really good model and you put the data in and say, "What would happen if I doubled the force?" But to do that, you'd have to go back and do the experiment and double the force. You have to redo it. Now, I've doubled the force, but what if I tripled it? You can change things in a computer if the computer behaves. It's called "the model is well behaved," in other words, tracking what you do. That's a big ticket, now.

LK: You all are working more and more with computers. So has there been more coursework maybe for the dental students? Or is that something you pick up as you enter the lab?

WD: Well, in the research lab. You want to come into the research lab. But a lot of people that we have here are at their desks, so they've got that expertise.

But, now, Maria has put together a teaching tool for the computer. What's your program called [speaking to Maria Pintado]? The tooth explorer. It's the tooth explorer. You must see the tooth explorer. It just shows you what you can do with graphics. It makes learning density fun, providing you've got the patient.

LK: That's in the classroom?

WD: Yes. They all get it every year but students all know here how to do that. You've got to build know how. You buy brains.

LK: Yes.

[chuckles]

WD: I'm retired, right? So I work here. I'm seventy-six, almost. I say to Alex, "Are you sure you want me here?" He says to me, "Bill, I can buy knowledge any time. What I can't buy is enthusiasm."

[chuckles]

WD: Okay. There it is.

MP: It's this.

LK: Okay.

MP: This is the old version from 2007.

WD: It teaches you anatomy.

LK: Okay.

MP: Each student receives one of these.

LK: That's awesome.

WD: It's actually a computer game.

LK: Oh, really?

MP: Now, now, now.

WD: It is! They all love it. The kids are all literate now when they come in, you know.

LK: Right.

WD: I remember when I was here, let's say about 1980, when the first fax machine came in to the University of Minnesota. We're not talking computers now, the first fax machine. There was only one and it was in Morrill Hall. You had to go over to Morrill Hall if you wanted to use this thing called a fax machine. Do you know you could send it out globally?

LK: [laughter]

WD: Zoom! Zoom!

The first computers... Have we got our Apple IIe here? Did they throw them out?

MP: I think it's in storage.

WD: We still have our Apple IIe's.

LK: Yes, that's what she was telling me earlier.

WD: Chu, chu, chu, chu, chu...chu, chu, chu, chu, chu. Hey, they were great!

LK: Yes.

Did you have any relationship with University Hospitals or the dental hospitals that were later established?

WD: Not much that I can think of. Did we do anything with the hospitals [speaking to Maria Pintado]?

One of the things that we personally worked with was with Joan... Joan Backus? You know the lady in Orthopedics, orthopods at Hennepin County. Joan, oh, she's lovely. Her first name is Joan. Joan Bechtold.

LK: Okay. [chuckles]

MP: [unclear, reminding Dr. Douglas of something]

WD: Oh, yes, the famous...I'd actually forgotten that.

There was a reporter in the *Star*. That's the *Pioneer Star*, is it?

LK: Yes, the *Star Tribune*? [Correctly the *Minneapolis Star Tribune*]

WD: He got it into his head...he asked the question of Mortuary Science, "What happens with all these cremations of people who've got a lot of gold in their mouths? What happens to the gold?"

LK: Hmm.

WD: Is it being taken by technicians? Oh, dear. Oh, dear. So he was writing this paper. The director of Mortuary Science got very upset, as you can imagine. So he comes to our dean, and it happened to be [Richard] Elzay. He says, "Can you help me here?" Doctor Elzay came to us for help—that is to myself and Doctor Steve Keck. We go over to Mortuary Science. We get this cadaver, a dead person. We'd put in an inlay right here, a gold one here, right? We'll incinerate it. It gets incinerated and we go and try to find the gold. Can't find it. It gets splattered. You can't see it anywhere. I don't know where it goes. You can't see it. This *Star* reporter finds out about this. So he calls me up, "I understand you're doing this. What happened?" I said, "I'm sorry I can't tell you because I'm doing it for the director of Mortuary Science. I'm going to issue a report for him first." "Oh, I see," he says, "I understand. Tell me, how are you going to find the gold?" I said, "If there's any gold there, I'll find it." The next day, the *Star Tribune* headlines, second page, "If there's any gold there, I'll find it, said Doctor Douglas."

LK: [laughter]

WD: Don't ever talk to a reporter. Ever! Not even for thirty seconds. It's true!

LK: How did you get roped into doing it?

WD: Where else would you go? We were the biomaterials people.

LK: That's true. How funny.

MP: We also had a lady, remember, who sent to us to identify the bite marks. That was very interesting too.

WD: Oh, yes. We got into criminal forensics a little bit. We didn't take it very far, actually. The thing is very often, particularly in domestic violence, there's biting as well as hitting. Then, there's teeth marks. Well, from those teeth marks, if you know how to accurately, which is what we did, profile the surface of the teeth, you can find if there's a fit. So you know who bit who, you see. We started to do a little bit of that, but didn't pursue it.

LK: Okay.

WD: Actually, the people who do that with their eyes are quite good at it.

[laughter]

WD: There was something else I had to remember that you said [speaking to Maria Pintado].

MP: The bite mark.

WD: I did the bite mark, but there was something else we did.

Ohhh, yes. Koala bears.

MP: Oh, yes, my koala bears.

WD: We worked on koala bears. We had a guy from Australia—Doctor Bill Young. He did a sabbatical. Why was he interested in koala bears?

MP: Because he wanted to identify the age of the koalas.

WD: I don't know how I got into this.

LK: [chuckles]

WD: Everybody shows up.

MP: By looking at the wear of the teeth.

WD: Why was he interested in the wear of the koala bears...?

MP: Because of the preservation of the koalas.

WD: For some reason, these Aussies are very worried about... Now, koala bears eat one thing and one thing only: eucalyptus leaves. They don't eat anything else. Nothing but eucalyptus leaves. One diet and they survive on it. So we got koala teeth, of course, and put it in our artificial mouth. But we couldn't find the eucalyptus leaves, enough of them. So, then, we find out that the San Diego Zoo... Was it the San Diego Zoo [speaking to Maria Pintado]?

MP: It was the San Diego Zoo I wrote to.

WD: The San Diego Zoo had a rich supply of eucalyptus leaves. They sent us eucalyptus leaves. We'd mash them all up, put them in the artificial mouth, have these koala teeth chewing away and measure it.

[Maria Pintado brings in papers]

LK: Oh, wow!

WD: Is that it?

MP: Yes. That paper is here.

WD: Where?

MP: Here.

WD: How does she find it? She's got all this stuff.

LK: How funny.

WD: Who's the first name is on it? Bill Young. Who's second?

MP: I'm the last one.

WD: Ohhh, you're normally first.

MP: We have a big staff, you know.

WD: Are there any pictures in it?

MP: Yes, the koalas eating.

LK: Oh, wow.

WD: There are all three koalas.

LK: Yes.

WD: We published this thing. All the bears.

LK: [chuckles]

WD: Is this still it? It goes on and on. This is all about koalas.

LK: Did you do any other work with animals or just the koalas?

WD: Just the koalas. We often used bovine teeth, though.

LK: Oh, really?

WD: Oh, a lot. Bovine teeth are reckoned to be a reasonable substitute for human enamel, so we used a lot of bovine.

LK: That's fascinating. I would never have thought of all these things.

The one thing that I saw between the University Hospitals and the Dental School in particular was dentistry working with the transplant program, the pediatric transplant program. I didn't know if you had any involvement in that at all.

WD: I don't think so. What were they transplanting? Teeth?

LK: No, they were transplanting organs, but they were also involved in dental care of the teeth.

WD: Oh, yes, you have to. No, we weren't involved, I don't think.

LK: Okay.

Then, I know that you all got a lot of funding from 3M and NIH, but was there any other...?

WD: Yes, we got funding from Dent Supply. We did quite a bit for GlaxoSmithKline. In the clinical study I told you about, it was Gillette.

LK: Right.

WD: Anyone else? Oh, yes, Ormco in orthodontics now under the leadership of Doctor Condrado Aparicio.

LK: What were you doing with GlaxoSmithKline?

WD: Uhhh... Let me think now. What was it [whispered]? They were trying to find out when your teeth wear, what was the contribution of acid? It was a combination of mechanical wear and acid dissolution. They wanted to know what was the relationship between the two.

I did other things though. Oh, yes, another big thing was stain removal. A lady called Daranee, D-a-r-a-n-e-e—and I'll spell it, Tantbirjn—T-a-n-t-b-i-r-j-n.

LK: I never would have....

WD: Look it up though. You'll get it.

LK: Okay.

WD: They had a material, which is actually a triphosphate, which was part of their cleansing process in toothpastes. They put a small amount in, two percent. So we had to get stained teeth. It's very hard to get stained teeth, but we got them from Thailand where they chew betel nut. The betel nut makes it really stain, so she was able to get them. So we had these imported.

LK: Oh, wow!

WD: Then, we put them in, and we exposed them to various degrees. We could show it rolling up and falling off.

LK: Wow.

WD: That's for GlaxoSmithKline.

LK: That's really cool.

WD: But, you know, we took a video of it, and they loved it. It's now great, great, great. We thought they were going to use it in their advertising, the sales people saw it and said, "Yuuuugh!"

LK: [laughter]

WD: They weren't going to let them use it. It was gross. Because you can see the stain rolling off the tooth!

LK: Yes.

WD: They knew it worked, but you couldn't tell them. [chuckles]

MP: What was gross?

WD: The stuff Daranee did with the betel nut.

MP: Oh, geez.

[extraneous conversation]

LK: We've talked a lot about collaboration with Engineering and Computer Science. Did you have a lot of interaction with the Medical School or Nursing or Pharmacy or any of the other AHC entities?

WD: We did something with the heart people. Do you remember that [speaking to Maria Pintado]? Who did we collaborate with in...?

MP: [unclear]

WD: Now, he works for the Saint Paul Heart [Clinic, PA; now United Heart and Vascular Clinic], but he used to work here. What did we do? We were modeling atherosclerosis. What happens when you have a heart disease, you get this plug, then, what happens is it fractures, and it breaks off and starts to travel, and it gets stuck in your coronary. That's how you get a heart attack. He was trying to flex this and see what the strength of it was. We got images from ultrasound, so we knew the size of it, and we knew something about it. He tried to model that. We can model anything.

LK: People come to you because of also your programming?

WD: They're looking for a measurement. Can we measure this? Can you tell me if I do this what will happen? It's all the what-if things. What if? How long will it last? All that stuff. Prognostication.

[chuckles]

LK: Was there any other collaboration with...?

WD: What else did we do over there [speaking to Maria Pintado]?

MP: Mainly it was the modeling.

WD: Ohhh, through Joan Becktold, we did a lot on orthopedics. I'm just trying to remember what we did with her. Alex is working with her even now, so he'll know her name.

LK: Okay.

WD: Are you going to interview Alex?

LK: I hadn't planned on it, no.

WD: He's interesting.

LK: Did you have any interaction with Lyle French when he was vice president of health sciences? He was leaving as you were coming in.

WD: Right, right. I had a brief encounter. I told you, right? We had this dental alumni party. This is the only time I really met him. They got me to give a talk, an after dinner talk, on "Two Nations Separated by a Common Language."

LK: Oh, right.

WD: I get up, and it's supposed to be funny, right? He was at the top table. He's sitting next to my wife. They always did get along very well together. That's as much as I know about him.

LK: Okay.

WD: He was looked upon as a good friend of the Dental School.

LK: Did people give you a lot of grief about being from the UK?

WD: Uh, no. Just that he talks funny.

[laughter]

LK: Did you have much interaction with Erwin [M.] Schaffer?

WD: Yes.

LK: He was still here?

WD: Yes, but he was very much reduced role in those days. Actually, he left in 1977, and I came in 1978, so I just missed him.

Actually, Doctor Oliver hired me, but he also allowed me to grow. He allowed me to hire Maria, and he allowed me to bring on Ralph. Those are the two things he did. That was our core, the three of us.

LK: And, now, it's up to twenty?

WD: What's the head count [speaking to Maria Pintado]?

MP: Counting students and post docs about twenty.

WD: Counting everybody.

MP: But also we have different numbers, between eighteen and twenty people.

WD: I had twenty at one point. Do you have that photograph of us all with the Quacklings?

MP: Grad students and post docs...

WD: They all end up here. At some point you wonder... They land on your door. Here, Doc, I'm supposed to do research. Oh, really? [chuckles]

LK: So you have grad students from Engineering?

WD: Yes, we do.

LK: Do you have DDS-Ph.D.s much?

WD: Yes, we have Ph.D.s. We did some work with Dr. Chris Macosko from Chemical Engineering, and one of his students.

MP: This is one of them. [shows picture]

WD: Oh, yes, he's working. That's an up-to-date one, isn't it [speaking to Maria Pintado]?

WD: One of the things we did with Doctor Macosko was--he's trying to invent a new material... You know chewing gum is bad news, right?

LK: Oh, no, I didn't.

WD: Oh, no, chewing gum is bad. In Singapore, they get very upset with you if you're chewing gum, because you can't get rid of it. It won't go away. It won't go away, literally. He's trying to make a biodegradable chewing gum.

LK: Ohhh.

WD: But then how do you know it's chewable? Well, you come to the artificial mouth, don't you? You bend it over and get it to chew. So he had his graduate students come over here trying to learn how to chew in order to work on his chewing gum, which he's doing for Wrigley's.

LK: Wow.

WD: Yes, all kinds of unusual stuff.

LK: Yes. [chuckles]

WD: People don't realize how important their teeth are. Even the medical profession, they don't realize it. If you lose your teeth, you're very miserable, very miserable.

LK: You can't eat.

WD: You've got to be able to smile at people.

MP: This is a historical picture. There's Doctor DeLong and Doctor Sakaguchi, myself, and our secretary.

WD: I decided to lose weight. I did. People thought I had cancer.

LK: Really?

WD: Schaffer said to me once, "Are you okay? Are you sure you're okay?" [whispered]

LK: Oh, wow.

WD: Yes, I decided to lose weight fast. Look at that. She looks thirty. That's when she was thirty-five. It's only a few years ago.

MP: On the contrary.

WD: This is Ralph, he's white, absolutely white.

MP: DeLong.

LK: Do you have any other comments on Dr. Oliver's leadership style? It sounds like he was generally supportive.

WD: Oh, yes.

LK: Would you say hands off?

WD: Yes, he wasn't a micromanager, not by any means. But he did like you to produce. At the end of the day, you had to be... There are two things to say here. You can be high maintenance and well funded. You can be not funded and low maintenance. The one thing you can't be is low funded and high maintenance.

[chuckles]

WD: You have to have a redeeming feature. Okay?

LK: Yes.

WD: If I'm going to get along with you... He's well funded, he's a good researcher, that's fine. You've got to have one of them. He was tough enough. He was a tough guy, tough enough to make certain things happen. In the end, after ten years of that, you've had enough and maybe the rest have had enough, as well, and time for a new phase. As I say, the retrenchment didn't go away.

Doctor Elzay got really frustrated with the endless retrenchment.

LK: Yes. In going into that, I know that in 1988, there was that threat of the closure of the Dental School.

WD: Oh, yes. That was Doctor [President Kenneth] Keller.

LK: Was that when the strategic planning began?

WD: No, it was some time after that.

LK: I have it overlapping.

WD: It may have been prompted down the line. Of course, if you thought about it twice, once, even twice, there's no dental school between here and the Pacific [Ocean].

LK: Right.

WD: We pull from ten states, you know. We already have a manpower problem, you know. But if you come from a research background, like Doctor Keller did, or that kind of thing, not realizing... The thing about a professional school, you better be producing people who go out and treat people. It's not like you're a chemical engineer and you get a job in Houston, Texas. You've got to supply it. But, I don't think he understood the difference between a professional school and the rest of the University—i.e. clinical excellence.

LK: Ohhh.

Did you have any part in those efforts to prevent the closure?

WD: Some people got very hot under the collar and there was a lot of hard letters here, there, and everywhere. No, I didn't go on the street with a sign.

MP: We made this book for him for his [Doctor Douglas's] retirement party. I just want to show you one here. You can see it's kind of cute. There it is of the three of us.

WD: Let's have a look. Look at that shirt! Look at her hairstyle. I can't believe it.

LK: [chuckles]

WD: Ralph's already got a white mustache though.

MP: Here are some of the graduate students.

WD: That's a good headcount there.

MP: This was in South Africa.

WD: You've got the Quacklings, there?

MP: One only. The other one wasn't here. They were from China, England, America, India.

WD: That's Daranee Tantbirjn.

MP: They just got in from Thailand.

WD: Is Anthony [Versluis] there? He must be. There he is.

MP: Oh, yes, back there, from the Netherlands.

WD: There's Anthony.

MP: They came from all over. He's from India.

WD: Oh, yes.

LK: It sounds like you all had a very international...

MP: Oh, very.

WD: Yes. Actually, I heard a rumor—I don't know if it's true—that you had to be international to get hired up here. [joking]

[laughter]

WD: She's [referring to Maria Pintado] got all the archives. Have you interviewed her?

LK: Yes, I have. I have.

WD: I want to see her transcript.

MP: No, no.

[laughter]

MP: Absolutely not.

WD: All this stuff... You will tell me. I didn't know you had this. She can produce anything. Where do you keep this?

MP: Well, Doctor Bill Young he sent it to me. He passed away. He was a professor of Restorative here, with Doctor Bob Gorlin. He went back to Australia.

LK: Okay.

MP: He kept in touch, and then he decided to do that study with the koala bear. He came over here himself. It was fun working with him. He was a very nice man.

WD: He was really into tooth wear, as well. Tooth wear is a big problem in Australia, especially in Queensland. What happens is, it's very much an outdoor life. People go out and they jog, and they get really hot, and their mouth gets dry, because it can't keep up... They take a power drink that's quite acidic, and they get a lot of tooth dissolution, called dental erosion. There's a *lot* of dissolution in Australia.

LK: Hmm.

WD: Instead of taking water first and getting their saliva back... Saliva has got a big buffer effect.

LK: Right.

Have you done a lot of cultural studies almost with different teeth ware?

WD: Only indirectly. We got involved in that. He would send us models... He would take impressions in Queensland, send them half way around the world to us, and we'd measure the wear here, and we'd send them back to him.

LK: Does anyplace else have an artificial mouth?

WD: Yes, there are others. Yes, in several places. They're probably not artificial mouths. They're simpler things and don't have a real chewing cycle. There are four or five in America. There are lots in the rest of the world, though. There are lots in Brazil, for instance. Do you know there are sixty dental schools in Brazil?

LK: No, I didn't.

WD: Six-O [60]. Yes, there's a huge number of dental schools.

LK: Yes. How many are there in the United States?

WD: Fifty-five.

LK: Wow.

WD: But there are sixty there. That's a lot. Sao Paulo's got three, I think.

LK: Have you all done any traveling to do training in other dental schools around the technologies you all use?

WD: Do you mean go to other schools and give a lecture?

LK: I didn't know if it was like a longer thing even.

WD: Yes, we did a little bit. For instance, because of these Artificial Mouths and/or the digital measurement system to measure the wear we had some cooperation and instruction with the dental school in Omaha, Nebraska and Doctor Mark Lattta, L-a-t-t-a. He actually got one of those, and then came here for three days of training. We also did some for Manchester [England]. What was a young man called from Manchester who came here [speaking to Maria Pintado]?

MP: [unclear]

WD: Sean Whitehead?

MP: Oh, Sean Whitehead, yes.

WD: He came here. He came here for three days of training. We used to do that. These were made by people for a while. Now they are made by MTS, these. They only sold about ten, I think.

LK: In terms of Doctor Elzay and the potential for the school's closure, did that change the morale of the Dental School at all or once it kind of blew over...?

WD: I think they dug their heels in. So I think they went on the offensive.

LK: Okay.

Then, was it another ten years of retrenchment?

WD: Yes, Elzay faced a lot of retrenchment. I don't know if this is recordable or not. I think maybe he had enough, too. You can only retrench so much, because you don't give any good news. Lyle said, "You're high maintenance, and you're funded." You can give some bad news, but you have to have some good news.

LK: Right.

WD: But it was just retrench, retrench, and retrench. We don't know why that was, though. Other colleges weren't getting retrenched.

LK: Oh. Okay.

WD: As far we understood. For instance, it's our understanding that Veterinary Science wasn't being retrenched.

LK: Really? I thought they were threatened to be closed, as well.

WD: Oh, yes. Yes, but that's a Doctor Keller concept as far we understood it. It is interesting to note that Veterinary Science is also a professional school—that is they are charged with training veterinarians who are then licensed to practice that art and science. [whispered]

LK: Okay.

WD: I suppose it can be hard to understand why you'd need to produce vets? They weren't doing IT or Chemistry. But they had to produce vets. It's an agricultural state! Don't you get it?!

LK: [laughter]

I had that the Strategic Planning Committee was created through Ken Keller's Commitment to Focus. But you said you worked on it later?

WD: That was later. Yes.

LK: I wondered if it was something different.

WD: No, it was a Frank Cerra mission as far as I remember.

LK: Okay.

WD: What got me into that was... I think it was before that I ended up as co-chair to find a new dean with Sandra Edwardson of the Search Committee.

LK: A new dean for the Dental School?

WD: Dental School, yes. In fact, we didn't get a new dean, so Doctor Mike [Michael] Till took the position—that turned out to be a great appointment. Morale rallied, and things got moving again.

WD: After that, I ended up on the Strategic Committee.

LK: With Sandra Edwardson?

WD: No. Beyond that. After that, I ended up on Strategic Planning for the Dental School. There were those things: clinic, research, digital, etc.

LK: What were your goals through that committee?

WD: Oh, wow. I'll try and look this up, if can.

LK: Okay.

WD: I had fundamental questions. I was given a lot of freedom. The great thing was to identify your weaknesses, find opportunity. What does the future look like? What should we be doing that we were not doing? All those kinds of things, you know. I tried to get as many people involved as I could. I was helped a lot by Doctor Gary Anderson.

[extraneous conversation]

WD: Everybody had to be on board. It was a bottom-up thing, you know. It was the idea of consensus on each of the big issues, research, clinical, all that kind of stuff. Then, I had little teams, sub-teams. I had people on clinics, people on research, people on electronics things and all that. I think administration as well. Then, I had reports, and I would report those back, then they were all put together. Then, he changed, moved onto the next phase, and he made each of us responsible for one of the four bigger issues for the whole Academic Health Center.

LK: He being?

WD: Frank. Right. So we had all that data. How is this going to play out for the whole place? So I had the digital library services Internet thing, you know. What can we be doing that we're not doing? Patient records, all that stuff. Again, we had people coming together. We met in the medical school, the surgeons, the dentists, you know. We would talk. He would go around to each of us. I had Terry Bach and the bacteriologist who has retired. What's his name? I'm going to get it.

LK: We can add it later.

WD: Then, I had to present it to the Regents.

LK: Oh, wow.

WD: I was sitting there with the Regents. I said, "This is what we've done," and "This is what we think" et cetera, et cetera... Then, they asked me questions.

LK: What was your relationship with Frank Cerra like? It sounds like it was pretty friendly.

WD: Yes, it was very good. He wanted me to do more than I wanted to do—because I was interim chair of Oral Biology, as it was then. Particularly I wanted to rescue Oral Pathology, which at a very low ebb. That was solved by the appointment of Doctor Mike Rohrer.

What did he want me to do? Oh, yes. When he put me on this first as chair of the Dental Strategic Plan, I tried to spread the burden as well as the expertise. I thought, oh, I don't want to do this on my own. So I wrote, "Thanks very much. Can I bring on somebody else as a co-chair?" He said, "Yes!" Just one word, "Yes." This was Friday. Monday morning, he said, "I can't do that. If I did it for you, I'd have to do it for everybody." I was back to this thing by myself. I was back to this thing by myself.

LK: [laughter]

WD: I don't know what I could have done to change that. I was chair. The French have a word [unclear], it means in spite of yourself.

LK: Did you all make a lot of budgetary decisions as well?

WD: On that sort of thing?

LK: Yes.

WD: I don't think so as I remember it. We didn't have budget constraints. It was just where should we go? What should we do? What needs to be fixed? Where do the opportunities lie? What does the future look like?

LK: Then, I saw that you had a membership on the International Association for Dental Research [IAR]. Is that correct?

WD: Oh, yes. All of us are on that. I've had a thing called the Souder Award, S-o-u-d-e-r, which is the oldest international award that the IAR gives.

LK: Was that for the artificial mouth?

WD: It was for contributions to dental research.

LK: Awesome.

WD: Then, I got the Hollenback Award by the Academy of Operative Dentistry, again for contributions.

LK: Then, I saw that you were a consultant for British Standards Institute [BSI] for dental materials.

WD: Oh, yes. That was before I came here though.

LK: Oh, okay.

WD: BSI, yes. We had an ISO 9000. Do you know about that?

LK: No.

WD: It's the National Standard for Organizations. BSI was one of the first. This was before I came to America, though. We used to get together and say, "How would you test something?" The thing about that was not every lab is sophisticated. Some labs are very simple, you know. You can't have something and say, "Okay, we need an artificial mouth. It will cost a half a million dollars." You can't do that. You have to come up with something that's simple enough that even the simplest lab can use some kind of standard. I ended up in that.

LK: Okay. Did you do anything like that in the United States?

WD: Uhhh... Yes. I was on the BDA standards. It's not [unclear].

LK: Okay. [chuckles]

Then, I also saw that you were a consultant for the Minnesota Department of Health.

WD: Right, that was in connection with amalgam, dental fillings. Because we had a big worry about mercury and so on.

LK: Ohhh, okay.

WD: One of the issues is not so much with the amalgam you put in the patient's mouth. It's more what happens to the excess when it goes down the drain. It ends up in Pigs Eye Island and gets burned and goes into the air. The big thing to control is waste mercury. What do you do with the waste?

LK: How long were you doing that study?

WD: It went on for a while, six months maybe. Again, it's not terribly exciting, but it was essential and had to be done.

LK: I didn't know if you had any more comments on the leadership style of Doctor Elzay.

WD: Elzay had very much an open door, almost literally. He would never close his door to his office... only on certain occasions—that was to make the point that there was no secret agenda. I have to give him credit for that!

LK: Oh, really?

WD: ...even when you were in there.

LK: Wow.

WD: So you couldn't go in there and have a fight with him.

LK: [laughter]

WD: He had his door open all the time. That was him. He changed the style very much. Doctor Oliver was very much a tough and resilient guy, you know. Elzay was open door more perhaps more discursive. But he ran into the same problems: retrenchment after retrenchment after retrenchment. This is very much as I saw it at the time.

LK: Right.

WD: He was very supportive of us, though. Doctor Elzay was a supporter of us. Wouldn't you say so [speaking to Maria Pintado]?

MP: Yes.

WD: So was Doctor Till.

MP: Yes.

WD: Doctor Till was very supportive. I've always had deans that supported me.

LK: What was Till's leadership style like?

WD: Good. For us it was very good. I was chair of Oral Biology then. Yes.

LK: When Doctor Oliver came in, it sounds like his emphasis was very much on research and making the clinical research connection.

WD: Right.

LK: Did that change at all with Elzay?

WD: I think it kept on going.

LK: Okay.

WD: Our Perio Department was very good in research. We had really good research in many areas. The one area where we wanted to improve was in Restorative. We do dental materials, right? That's got a close connection with Restorative. We were really into research on restorative dentistry. But clinical research in restorative dentistry is hard

to do...long, slow. The slow step is evaluation, measurement. You can put a filling in fifty people, bring them back, and have a look. But measurement was very nonparametric—almost anecdotal.

LK: Do you have any comments on the Minnesota Dental Association [MDA] or did you have any involvement in that?

WD: MDA?

LK: Yes.

WD: That was in connection with the amalgam.

LK: Oh, okay. Okay.

WD: Quite often I gave lectures to the subgroups of MDA.

LK: Like continuing education, stuff?

WD: Oh, I did a lot of it at one point, a lot, a lot, a lot.

LK: Do you have any comments on relations with the State Legislature? I don't know if you ever had...

WD: Never direct—except, I did a lecture once for 3M in the famous building, 226, which is the executive suite, with Arne Carlson. What do you call the president of our University those days [speaking to Maria Pintado]? Remember he came from Texas and he went back to Texas. After Keller, who was it. Mark Yudoff.

Anyway, the guests of honor were Arne Carlson, Doctor Mark Yudoff, and several senior executives of 3M and the 3M Foundation.

I don't know why they [referring to 3M] had us all over giving lectures. We had a guy from University Astronomy and me. So I gave this lecture. I had this picture of Yudoff in the middle of my slide. I was talking about the Virtual Dental Patients, and I had all these different factors, for example, you can take his teeth and this and that and you can put the patient back together in virtual space—then, as it were, you can examine the patient in his or her absence. For the patient example, I had the Mark Yudoff image on the screen—he was the patient we were examining. The point was with computers you could not only do things better, you could do things that otherwise were unthinkable and that changes the nature of competition.

LK: How funny.

WD: That shook them up. Mike Till was kind enough to report back to the executive committee and said, "Bill Douglas hit a home run for the Dental School."

LK: Do you have any final thoughts on the Dental School or anything that I didn't ask you about?

WD: The Dental School... Well, I think it's going to be digital all the way...digital teaching, but not only that. There are so many tools coming into the office. The dentist sitting in the center of technology. Now, the new oral devices for scanning your mouth... Instead of taking an impression, they scan it now.

LK: Oh, wow.

WD: Once you scan that, you can put that into a mill, which cuts out the filling. Now, they're trying to measure frontline wear in the dental office. Once you've got that image and you cut a tooth that means you hold that image and you come back later and keep the image again, and if there's a change, you can measure the change. So you have a clinical measurement in digital terms and graphical terms. It's moving into the clinical. It's going to take over.

LK: Wow.

WD: I've got so many screens. It's unbelievable. There were no screens when I came here at first. No computers. Nothing.

LK: Just the Apple IIe?

WD: Even before that.

LK: Oh, really?

WD: We had the what's-it in Morrill Hall—in the early days

LK: Oh, the fax machine.

WD: The famous fax machine. Line up to use the fax machine.

LK: Any ideas on other people I should speak to?

WD: Alex. He would be important.

LK: Okay.

WD: He's got a new view of where he wants to go and all that.

There is one final thing I would like to say. It is assumed that when you take on a graduate student he or she learns something from you—and that is of course true. But there are times when you learn something from your graduate student. That happened

with one of my graduate students—Doctor Chun-Pin Lin. He was a creative star of a student who did some of the most original research I have ever been associated with in dentistry in the amelo-dental junction. He went to be a professor and finally Dean of his Dental School at National Taiwan University. Get ten to twenty graduate students like that, and you would be “famous.” And when you do get dental graduate students like Dr. Lin it is fun to watch their progress—by the way Dr. Lin is now an International Fellow of the University of Minnesota.

LK: That is wonderful!

Thank you so much.

WD: Well, good! Glad to meet you.

LK: Yes.

[End of the Interview]

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