An Interview with

MICHAEL R. WILLIAMS, PhD

Conducted by David Walden

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in Portland, OR

Abstract

In this interview, Mike Williams discusses his college career in Calgary, Alberta, Canada, where he first encountered computers, and in Glasgow, Scotland. In graduate school in Glasgow, he first became interesting in computing history. He spent the rest of his professional career back in Calgary in the computer science department at the University of Calgary from which he retired many years later. In parallel with his academic career, Mike was involved in a variety of computing history activities with other institutions and with other computing historians. He also served in many positions with the IEEE Computer Society and the IEEE, including at 2007 president of the Computer Society.

Walden: Today is February 23, 2014; I'm Dave Walden and I'm with the 2007 Computer Society President, Michael R. Williams. We're in my rented apartment in Portland, Oregon, to which Mike has driven from his home in Calgary, Alberta. Mike, thank you for agreeing to do this interview and for making the long drive to Portland.

Williams: My pleasure.

Walden: For posterity, let me say I was willing to fly to Calgary. Also for the record, this interview is being recorded and after we're finished it will be transcribed by a professional transcriber; I'll then do a pass over the written transcript, trying to fill in things the transcriber didn't understand and removing unnecessary words like "ah" and "um." And then I'll pass the interview for you to review it. Once you're satisfied, the corrected transcript will be posted on the website of the Computer Society History Committee, and in a special category on the website of the IEEE History Committee's Global History Network. Thus, before we part, I'll need you to sign a release.

Williams: No problem.

Walden: Let's begin. Please tell a bit about where you're from, your youth, your hobbies; anything you think is interesting about your parents and growing up.

Williams: I was born in Calgary, Alberta, Canada in 1942 to a family that was very much a working class family. There was never enough money to go around. I had two

older brothers and a younger sister, and it was a pretty happy arrangement. All of my siblings are at least five, and sometimes seven years between us, so we are spread out over a very large number of years; and they're all still alive at the moment, although the oldest one is getting into a pretty tough physical shape. I went to school in Calgary and by and large, stayed in Calgary for most of my life. There were plenty of times I've been elsewhere, sometimes for several years at a time, but I always tended to come back. I was always interested in science, and I read quite a bit about science, and of course, science fiction as well, and quite enjoyed a chemistry teacher in high school, who was very good and encouraged us to do all sorts of things that wasn't in the curriculum and even supervised when we were doing some fairly dangerous things, like creating bromine gas in a fume hood. There were half a dozen of us, I guess, in this chemistry club and we really got into doing some interesting stuff. So it was only natural that when I wanted to go to university I would've taken a degree in chemistry. There was no university in Calgary for most of the city's existence. The closest university was the University of Alberta in Edmonton, 200 miles further north. The very year that I was going to go to university, they created a new sub-campus in Calgary, of the University of Alberta. So although I went to the University of Alberta, it was in Calgary, not in Edmonton. After about two years I began to realize that chemistry was not so exciting as I once thought it would be and I had been introduced to computers at that point, as the fledgling university had acquired an IBM 1620, and I had known somebody who started at the same time as I did there, who was a school chum, who got into computers and he was the one who introduced me into computing. However, I tried to back out of chemistry and discovered that the only other option was either general science or math degree; there was certainly

no computer science degree in those days. I started university 1960, and so it was about 1961, I suppose, when I got more interested in computers than anything else. However, I would've had to sort of go back and catch up all sorts of courses I didn't have, so I actually ended up having a degree in chemistry, which I never used. I certainly had long since decided that I didn't want to pour gunk from one test tube into another for the rest of my life and I was actually employed at the university, doing some programming and things for both the university administration and some of the research staff. So I got very interested in computers and how they worked, and things. But then I was . . .

Walden: If I may interrupt you, about the IBM 1620 – you were doing assembly language or doing FORTRAN?

Williams: Both; mainly assembly language, actually, just because of the kinds of things I was doing for the university administration, we were scheduling final examination time tables, sectioning students to classes, things like that that were more easily done in Assembly language, but we did do some numerical stuff in FORTRAN. When I finally graduated, it was a bit of a tough time because again, there was no easily available degree in computer science anywhere. So I took what money I could make over the next summer, and put it in my jeans pocket; did the usual student thing; I got a boat across the Atlantic and ended up in Egypt. And Egypt has been one of my favorite places on the face of this earth ever since. It's a spectacular place. Even in later years, I took courses from the archaeology the department on reading Egyptian hieroglyphics and things like that. But to get back to 1960s, I was wandering around Alexandria when I discovered a

shop where I could buy a magazine, and that magazine was called *The New Scientist*, an English language magazine. And being short of English language reading material, I immediately bought it, sat down on a rock on the beach, and started looking through it. I eventually discovered an ad in the back for the University of Glasgow in Scotland, and that ad said they were looking for somebody to do some programming on their computer. I thought to myself, well, that would be interesting but this is a long way from Scotland and I didn't do anything about it. But I eventually started to run short on money and made my way hitchhiking, and things like that, back through Europe and into Britain. I had earlier met a fellow from Edinburgh, a student, and I thought oh, I'll hitchhike my way up to Edinburgh and I can sleep on his couch or something. When I started hitchhiking, my ride actually went to Glasgow, not to Edinburgh. When I got to Glasgow, I put up at the Youth Hostel, and it was raining cats and dogs. So I thought I'm not going to go out hitchhiking to get to Edinburgh, and I asked the warden what there was to do, and he said the university's across the way, you can go and read in the library or something. And that's when I thought oh, yeah, this was the place that had the ad for the computer. So I went over to the university and wandered around until I found out where the computer was, and talked to a few people in the hallways, graduate students and things like that, some undergraduates; and then just left -- went to the library. It was closing early for some reason that day, and they rang a bell at five o'clock to throw everybody out. I walked out intending to go back to the Youth Hostel when I noticed a fellow that I had talked with that morning named Sa'ad ben Hamid, from Libya, who was a graduate student. He noticed me at the same time and he said "oh, weren't you the one who was down and talking to us?" He said "we told our prof about you at lunchtime, he wants to

talk to you." I said "good, I'll go 'round, see if he's there." "Oh no, no, no; he's gone home." I thought okay, well, it's still raining, I'll see him tomorrow. When I saw him, he was sort of interested because I had been talking to some of these people about the stuff I had done in Calgary earlier, the work for the Registrar and things. He obviously had picked up on that somewhere, and by sheer coincidence the day before, the University of Glasgow Registrar had come to him and said "do you think this computer might be useful to us here in Glasgow?" Dennis Gilles, who's the prof in question—the only full professor and Head of the Department, said "let me think about it." So after talking to me for a couple of hours, and finding out what we were doing with the computer in Calgary, he finally said "do you want a job?" And I said "yes, but only if I can do graduate work in computer science at the same time". And he said "done!" I said "don't you need transcripts and things to show I've got a degree?" He said "we've been talking for two hours, I know you had lots of experience and I believe you've got a degree, you're in." I ended up staying there for four years and completing a Ph.D. in timetabling for universities, and classes, and schools, and things like that.

Walden: When you started in this area at Calgary, were you reading the literature about scheduling things or were you making it up yourself?

Williams: We were making it up ourselves because there was very little literature at that time. There was a math professor, named John Peck, who was the one who had spearheaded getting the small IBM 1620 computer in Calgary, and he said that he thought this was a graph theory problem and you could probably solve it by coloring the nodes of

a graph. And I said “how do you do that?” He said he didn’t know but he thought a little heuristic thing might work, you know; look for the node with the greatest number of edges attached to it and color that first, and then go on, and pick them off one at a time. So that’s where we started and basically, we just did it ourselves one way or another. And I think that same program for scheduling final exams was still operational in the 1990s. It had been rewritten half a dozen times for different machines, but it was still the same operational program. Then I think in the 1990s somewhere, they finally farmed it out to some commercial firm. So it had a good long life.

Walden: Back in Glasgow, then, you were still doing scheduling of things?

Williams: Yes, only at this point, I was getting much more into the theory of graphs and whatnot; and doing an awful lot of reading. So my thesis was graph theory with some practical applications, shall we say. And now, of course, if I look at my thesis, it looks completely ridiculous. The things that we were trying to do are nowadays probably done in second year assignments for computer students. But in those days it was a lot more cutting edge. It was actually more interesting for me because, after I had been there about a year, my supervisor, who was the professor in the Computer Science Department, Dennis Gilles; contracted tuberculosis. It wasn’t your usual tuberculosis of the lungs, this was the tuberculosis of the spine and kidneys, which is much, much more serious. He was in isolation in hospital for many months and then recuperating at home for many months afterwards. And so it was about another 18 months where he wasn’t there at all, and only minimal time for the next six months. So basically, I was on my own with help of other

graduate students — we tended to help ourselves — and it was, of course, in the 1960s, a very, very small department.

Walden: What computer were you using in Glasgow?

Williams: It was an English Electric KDF9, a giant machine compared to the IBM 1620 that we had in Calgary. I still rather like that machine—you could write most of your programs in Algol 60—and it was an interesting machine with an unusual architecture.

Walden: Was that Brian Randell's Algol 60 running on that machine?

Williams: Yes it was, and Brian and I became friends after a while.

Walden: You knew him?

Williams: Oh yes, very much so; and we still correspond on occasion. There were several different Algol compilers, actually, but certainly his Algol was the one that we would debug programs on because it was a very fast interpretive system. The students used that, as well, because, although it was slow in executing, it was very fast in checking syntax.

Walden: You said it was a small department but did it have a fairly decent set of computer science courses, or were they sort of creating the curriculum at the time?

Williams: They were creating the curriculum at the time, and the fact that the professor was no longer there proved to be very difficult. One of the senior university people — I can't even remember who it was, now — held a meeting and said there is a senior lecturer, two other lecturers in the department, and half a dozen graduate students. You people will have to run the department, and you people have to do all the teaching, and you people will have to do everything, even creating budgets and answering correspondence while the professor is no longer capable. And so I got thrown in the deep end. We had to establish the curriculum for the next couple of years, and do the lecturing, and all sorts of things like that ourselves. We organized our own seminars, both amongst ourselves and inviting other people come and speak. I don't remember him being there, but it would be likely that we invited people like Brian Randell. That stood me in very good stead because when I finally graduated, I was basically quite independent in research and knew an awful lot about the administration of a university. I had actually tried to find a job back in Canada, and one of the things that I did was to write to my old professor in Calgary, John Peck, and say that I didn't have any contact with people anymore and did he know if there were jobs going in Canada? I never heard back from him, which wasn't atypical as John was very bad at answering letters and things. About three weeks later I got a telegram from the Dean of Arts and Science at the University of Calgary, saying that I was appointed, starting September 1, in the Department of Mathematics (which taught computer stuff in those days), and asked me to lease confirm my acceptance Well, this came as a complete surprise and, in fact, I couldn't come because my Ph.D. orals were going to be at the end of October. So I telegrammed back

thanking them for the offer but that I was very sorry but I was committed to staying in Glasgow until about November 1. Thank you very much for offering but I can't accept. A few days passed when another telegram arrived saying that arrival November 1 is acceptable, please confirm. I thought, well, I've got to have a job to go to, I'll just take that offer and go to Calgary, and then I'll work there for a year and find something better. I just left my office in the middle of December this year and so, in fact, it was 45 years that I was in Calgary, having only intended to stay there for a year. It's treated me well.

But I had one other epiphany in Glasgow; and that's when I was writing my thesis and I had to work through weekends, along with doing everything else, trying to get all the writing done. I found it easier to not work at home, so I would go into my office, which I shared with two other people, and Saturdays and Sundays were better because those people weren't there. So one Sunday I was in the converted house that was our offices, and almost everything else had been stripped out of the house but in the kitchen there was still a stove and some cupboards. We used to make tea on the stove, and so Sunday afternoon I was the only person there, I went down to make myself some tea, and while I was waiting for the kettle to boil I was looking around and realized that there's all these cupboards; I wonder what's in them, never having thought of it before. So I opened up several only to discover them stuffed with books. To make a long story short, Dennis Gilles had once worked for a chap named Leslie Comrie, who'd written **…** who was quite big on machine calculation, and because Comrie had worked in the era before the electronic computer, it was mechanical calculating machines. When Comrie died, Gilles had acquired his library, and this was what I had found stuffed in all these cupboards. I

idly pulled a book out that was labeled “Charles Babbage,” and started to read. I soon discovered that people had done interesting things before the invention of computers. And I think the rest of that Sunday afternoon was spent with me sitting in the kitchen, drinking tea, and going through these old books and just having a fine time. That got me more interested in history than in the graph theory that I was actually [interrupted]

Walden: So already by the time you were just finishing your Ph.D. . . .

Williams: Yes.

Walden: **…** you were beginning to get interested in a subject other than your Ph.D. area?

Williams: That’s right, very quickly. Now, of course, it was difficult finding any such resource in Calgary; a brand new university didn’t have library facilities like that but they managed to get a whole bunch of stuff in whenever I requested something from interlibrary loan.

Walden: Let me ask a little bit more about Glasgow for a second. You told me a story one time about skipping a master’s degree at Glasgow. I’m wondering if you’d be willing to share that for the recorder.

Williams: Oh, sure. While I was in Glasgow, and even before I had left to go on my trip through North Africa, I had a girlfriend, Michelle, at home in Calgary. And when I left to

go traveling, she said if you can go, so can I; and she moved to California. She was an x-ray technician and she could easily find a job in those days. We continued to write back and forth for a while and finally, we decided this is silly: why don't we get married? We eventually compromised and met back to Calgary and got married, then flew back to Glasgow to continue my studies. That would've been about a year before I was finishing my master's degree, because that was how I had been admitted to Glasgow, as a master's degree student. I had actually written a master's degree thesis, again in graph theory, and my supervisor, Dennis Gilles, had just come back, at least part time. We took to going to lunch together, eating at the university someplace, and over lunch one day he said, can't I convince you to stay? He said, I'm shorthanded and I need veteran help, and you would be greatly appreciated. I said well, the only reason I'd stay is to do a Ph.D. He said we can arrange that. I said no you can't, because I had thought about this earlier and I had actually looked up regulations. Once I had a master's degree, I had to start my residency all over again and it was four years' residency for a Ph.D. I'd already put in about two-and-a-half years. I explained this to Dennis and he looked at me and he said "well, you don't have a master's degree yet." Shocked, I said what do you mean? I'd done exams; I'd written [the thesis]; and he said "you only get a master's degree when the senate approves the graduation list, and they're meeting at two o'clock this afternoon to approve the graduation list with your name on it. If we take your name off, you won't have a master's degree and you can continue for a Ph.D., using the time you've already spent here as part of your residency." I thought very quickly, and I figured I've got to check with my wife, she's working in the hospital, which was fortunately just about two blocks away. So I ran down to the hospital and got her out; and we had this rapid conversation;

and she said “this means a lot to you, doesn’t it?” I agreed. And she said “okay, go ahead.” I ran back and Dennis and I went and found the Registrar, and we went into the senate meeting rooms where everything was laid out ready for their meeting to start. The master graduation list was there, and I took a pen and I literally crossed my own name off the graduation list, at the same time thinking, “What on earth are you doing?!” [Laughs.] “If this doesn’t work out, you’ve got nothing.” But fortunately, it did; and Glasgow has been very good to me. They have actually given me an honorary Doctor of Science degree just a few years ago; for work in history. At that time, I had to make a speech to some assembled people from the department, but the President of the University was there as well. I reminded him that he still owed me a master’s degree but I think I would forgive him at this point. Everybody seemed to have a good laugh.

Walden: It’s a great story; thank you very much. So, you took the job in Calgary; now at the University of Calgary, which apparently had started since you left the University of Alberta branch in Calgary?

Williams: Yes, it was the year after I had graduated it finally became the University of Calgary.

Walden: The branch of the University of Alberta became the University of Calgary.

Williams: An independent university, yes.

Walden: But part of the university system?

Williams: Only in fact that both universities are government funded. But there's no actual governance between them at all. And so it has grown from the time that I was first there, when there were about 700 students and I don't know how many staff, up to now where there's 35,000 students and a lot of staff.

Walden: So at the University of Calgary when you went back for the first year (and then stayed for 45 years); you weren't working in a computing technical area but you were teaching computing courses?

Williams: Yes.

Walden: And were beginning to work in the computing history area?

Williams: Correct. I never really thought I would work in the computing history area. I was certainly interested, but the job at Calgary was technically in the Department of Mathematics. The Department of Mathematics was quite large. They were just discussing dividing the administration into 4 division: pure math, applied math, statistics, and computer science. Each of these groups was to have a chairman, along with the head of the entire Math Department. I was very junior at this point; I was 25 years old, I suppose; and there were some very much more senior individuals, in age. I think by that time, I was the only one who actually had the degree in computer science because they were rare

birds, in those days. And so, after the first year, the first summer came along; my wife had friends in California she wanted to go visit. So we took our vacation; went to California; and when we came back a few weeks later, there was a notice waiting for me in my mail box saying the Dean would like to see me. I thought, "oh dear, I wonder what I've done now." I went and talked to the Dean and he described how the divisions were being set up, because they hadn't actually been set up yet, and they all needed chairmen. He said he wanted me to be Chairman of the Computer Science Division. I reminded him that I was the most junior person there. And he said "yes, I don't like the senior ones, I want you to do it. I think you had some sort of administrative experience in Glasgow, didn't you?" I agreed. He said "good, then you can be Chairman." I said" but"**…**; and he said, "you don't have tenure, you have a choice. You can either resign now or you can become Chairman of the Computer Division." [Laughter] Now, I was too green to realize that he probably was joking but I swallowed hard and said, okay. I was only 25 years old and having been there for only five or six months at that point, I ended up chairing this small group of computing people that eventually grew, of course, into its own separate department. But that, too, gave me a lot of interesting administrative experience because we had to hire all sorts of people. Those were the days when money was flowing quite freely so we had lots of money to hire people and buy equipment. People were hard to find, money wasn't. Now it's the other way around.

Walden: So presumably then, I guess according to your CV, you were an Assistant Professor. You were probably hiring in other junior faculty members, albeit computer science people? Or were you hiring in more senior faculty members than yourself?

Williams: I was certainly hiring in more senior people than myself, if we could get them, which we seldom could. But I can recall one or two times when we did get some.

Walden: Interesting.

Williams: Yes, it was a bit strange.

Walden: So during this time, you're teaching courses; you're helping administer the Department or administering the Department; were you able to do any computing history during this time?

Williams: Not very much. But what I did discover was that when I was lecturing, if I just said this is the way it's done; you know, the parameter passing mechanisms in languages or something; some students would just accept it and go away without ever asking questions or anything else. And other students would not understand; and ask why is it done that way? If I could step back and say, look, years ago it was done this way and that didn't work very well because…; so it got changed to this. Then afterwards, when a better idea came along, it got changed again and this is what we finally have today, which seems to work fairly well but, you know, possibly more changes will come up. So giving a more historical perspective to some of these things seemed to help a lot of students understand why we did things, rather than just present it as a God-given situation. And it was things like that, that gradually got me to talk more and more about history and less

and less about other things, although I continued to teach programming languages and similar topics for most of my teaching career. I did eventually start a course in the history of computation, and it was the history of computation not the history of computers because we went all the way back to ancient Egypt to see how they did their arithmetic, follow up through the years and finally, after about four months of lecturing we'd come to about where the IBM /360 was developed. In those days that was the point where I'd usually quit because often the students could follow the developments themselves from that point on. Although today, they seem think no computer existed before the Apple.

Walden: After you'd been at Calgary for a few years, you were Visiting Professor at St. Andrews in Scotland. Were you just there for a sabbatical year, or six months? Or you just visited occasionally?

Williams: No, I was there for a sabbatical year. That occurred after my term as Chairman of the Computer Science Division stopped and I was given a sabbatical.

Walden: Somebody else took over as chair?

Williams: Yes, and I had a sabbatical year. Primarily it was done this way at the University of Calgary so you were not influencing the next person who came along.

Walden: I see, so they wanted you out of town.

Williams: Yes, and it's a good idea because a new person taking on the job should be able to make his or her own way and not be constantly looking over their shoulder or expecting you to show up raving and ranting in their office, or something. So I had a sabbatical at St. Andrews, where I was first able to really get into some history work because they had a very, very good, very old library dating from the late 1400s, I think.

Walden: I see from your list of publications that it was just after you began that sabbatical year that you began to have publications in computing history.

Williams: Yes, I think I probably wrote one of the first in St. Andrews.

Walden: Interesting.

Williams: And there was no place to publish it in those days. Any of the computing journals, like the *Communications of the ACM*, or the *British Computer Society Journal*, things like that, they weren't really into publishing any historically-oriented things. In fact the *Communications of the ACM*, when I had sent them something, just turned it down flat, saying we're not interested. I think it appeared in the *British Computer Journal* eventually. It was shortly after that, that the very first conference on the history of computing was organized at Los Alamos in New Mexico, 1977, I think it was. It was by invitation only and really what it was, was Nick Metropolis had organized it at his place in Los Alamos. And he had invited all of the pioneers to come and talk about what they had done, and it was all recorded on videotape. Really, it was to be a way of just

preserving some of this historical information. I plucked up my courage, wrote to Nick and said I was very interested and could I have an invitation please. He was very polite and generous and said certainly, come along. So I went down there and I got to actually meet most of the early pioneers, one way or another, and that really sparked my interest in a lot of this stuff. It was interesting that you could easily strike up a conversation. For example, I remember sitting beside Konrad Zuse one night and we spent about two hours over a very leisurely supper discussing his work. That opportunity just doesn't come along very often. Brian Randell was there; he did some historical work on the code breaking British Colossus machine. He brought somebody named Doc Cooms who had actually worked on building the Colossus, and we had sessions where we could ask him things. The British official secrets act was still in force and it's very draconian, you could go to jail for a ***very*** long time by breaking that. Doc Cooms was willing to talk about anything and everything. Brian would occasionally lean over, touch him and say, remember the act, and Cooms would shut up. We were all ready to kill Brian over it.

Walden: As you moved into history as your research area, was there a special area, a particular area you were focused on, or were you just looking at what was interesting to you at any time?

Williams: It was basically what was interesting to me at any time. I had started to gather as much information as I could about the early computers, generally vacuum tube one-off devices. There were papers that were published about these machines but they didn't contain much of the hard detail. For the hard detail you had to actually ask somebody

who knew. The published papers didn't tell you much in the way things like the circuitry and it didn't tell you the secrets of how you wired this thing up to do the work. It was usually just very hand-waving kind of descriptions. Having met these people, it allowed me to ask the more interesting questions — at least to me, the more interesting questions— and I developed the technique of sitting and talking to people, and then running back to my room, if I was out at a conference or something, and scribbling like mad for the next hour to try and get all these things down on paper so that I didn't forget. It was that way that I talked with people who had, for example, worked with Alan Turing. In those early days, nobody was willing to talk to me about Turing, and why he killed himself, and things. This was just not done. I can remember one fellow, Jim Wilkinson, the British numerical analyst [pause]

Walden: Symmetric matrices and all that.

Williams: That's right—he had worked with Turing at the NPL in Britain. He and I got together and were chatting about Turing, and he was describing Turing and his life in great detail. I can remember dashing up to my room afterwards and spending an hour scribbling all this stuff down. Now, of course, it's all common knowledge; it's in many biographies; but those days, it was just not publically well known.

Walden: Let's just run through the rest of your time at Calgary, and then maybe we can go on to all your involvement with professional societies, plus the couple of times you had jobs away from Calgary for a period of time; at the Smithsonian, or at the Computer

History Museum. So in Calgary, after St. Andrews, you went back and now you're an Associate Professor . . .

Williams: Yes, I don't remember exactly but it must have been about then that they promoted me.

Walden: . . . became Assistant Dean for the Faculty of Science, so administration has captured you some more.

Williams: Yes, and in many ways, that was the most interesting job I had. The Assistant Dean in those days dealt with all the student affairs. You got to see the very, very best students and you got to try and gently guide them along their way because the very, very best students seldom knew what they really wanted to do, they had so many options and choices open to them. And you also got to see the very worst, generally because you had to throw them out. But you also had the most interesting little bits and pieces of stuff that you had to do. Your word was God, and if a student came to you and said they were registered in the geology program and very interested in the geology of oil production, and this summer there's a course offered by Farleigh Dickinson University in the eastern U.S., and they would like would to take it and have it credited toward their program. I said, "okay, what's this course?" He said "well, at first it sounds a little flaky, we're going down to the Caribbean, we'll spend the morning skin-diving around reefs, and then in the afternoon there are classes about reef geology and how reefs play a very important part in the oil industry and things like that, but the Head of Geology won't approve it."

And so I simply wrote a note in the file that if he passes his course at Farleigh Dickinson, it counts toward his program; and the Head of Geology never spoke to me again after that. [Laughs.] There was all sorts of little things like that. I took the attitude that if somebody said they wanted to do something that was reasonable, and they'd thought about it; then why not? I know the fellow that had that job after me had a very Germanic attitude of 'we have rules and we will follow those rules,' whereas I had the just the opposite attitude. For somebody at the university level, it was a much better thing to let them do what they wanted to do rather than force them to do something they thought was not terribly interesting.

Walden: While you were Assistant Dean for a period of …, it looks like two or three years; did you have to give up some of your activities in the Computing Department?

Williams: I think I had some teaching relief but that was all. I certainly took the attitude that this is one of the things you did to help out. Nowadays, that attitude seems to be gone from anybody in the department. I think anybody who started the same time I did, or was part of the first cadre, we all chipped in together and helped everybody else out, whereas now, it's all 'well, that's not in my collective agreement, I'm not going to do it.' That was alien to me.

Walden: According to your CV, you spent, what was another sabbatical year, at Chico State?

Williams: Yes, and that was because there was a man from Chico State who used to come up to Calgary in the summertime, primarily because it was too hot in Chico in the summer. He didn't like Calgary in the winter, he had tried that once and thought that this was ridiculous. And so he would spend the winters in Chico, and the summers he would come up and teach in in Calgary. What I wanted to do was to have a place to go for sabbatical where they would leave me alone, and take all of these notes and things and try and write some papers, or book, or something. I didn't want the situation where **…** a number of other people I knew had tried sabbaticals at Berkeley and places like that, and they were basically treated like dirt. They were shoved into a room with eight other visitors, and there was a straight-backed wooden kitchen chair against the wall somewhere that they could use, and two feet of straight wooden table in front of them. Whereas this fellow from Chico said well, come down and we'll give you an office and help you out as best we can. In fact, they were a delight. It's a small place, it's noted as a party campus not a big academic place, but to me it was an absolute delight. They gave me the biggest office in the place because the chap who was normally occupying it was himself away that year. I immediately got involved in all of the Department's social activities; they even provided secretarial services for me, which was a real help. I actually wrote my first history book there.

Walden: And that was titled what?

Williams: It was called *A History of Computing Technology*, and it's still in print after all these years, though I don't think it sells very many copies any more. I was just in

Powell's bookstore, and it's not for sale there; I have seen it for sale there in past times but it's not for sale at the moment, but it is on their list, they're willing to get it if you want it sort of thing. I was surprised to find that it's still current.

Walden: After your sabbatical, you returned to University of Calgary where, in time, you became a full professor.

[several lines of text by Walden and Williams deleted here to eliminate a mistaken question by Walden and start of an answer by Williams.]

Williams: Yes. It's hard for me to remember what year these things happened, but there are hoops to jump through and I think probably publishing that book (although I had done another book earlier but it was a book of problems for people to solve, a set of computer exercises) had helped my publishing career to get to the point where I was known internationally because you had to have letters from international people saying yes, he's known and I wouldn't bring shame on the university and things like that. So I'd eventually reached that stage and they made me a full professor.

Walden: Then somehow in 1986, the Smithsonian called you.

Williams: Yes, and that was a big surprise. I now know how it happened because I eventually found out there was a professor of the history of science at Harvard named I.B. Cohen and I had met him in passing a couple of times. He was interested in computing because Howard Aiken, one of the early pioneers, was at Harvard and Cohen

must have read some of the stuff that I did. He was on an advisory board to the Smithsonian, and they were thinking about doing a computer exhibit and they thought okay, we need somebody who knows about the early days, and they asked Cohen who would you have come down here? And he said me. Why he said me, I really have no idea but I will be forever thankful because it was a very interesting time. I went down there for, I think initially, about four months, and then they were looking for a permanent curator of computers and they asked if I would apply. Now, just at that time, my mother was getting quite old and had developed Alzheimer's and so she was in a nursing home. Also my father had started losing his eyesight. Now, I had two siblings left in Calgary, at that point, and they could take part in the family care at the nursing home, but I sort of felt guilty and thought 'do I really want to be that far away?' No, I don't think so. So we made an arrangement that I would leave the Smithsonian but then I would come back in the summertime. And I went back for several summers in a row to help with the curation for the computer project—the exhibit was eventually named *The Information Revolution*. In the meantime, they appointed an official curator of computers. And I have been quite happy that I didn't take that job, or didn't apply for it, because I discovered that the Smithsonian is a very, very interesting place to work with very, very interesting people there, but it's also rife with politics; it's worse than the university; it's worse than almost any place I've seen. It depends on who the head of any particular museum is because they will come in and say 'oh well, I don't like this, I don't like that; I think we'll tear down this end of the building and erect something else because I like my architectural things done a different way.' Everybody sort of runs for cover at that point. So I'm glad I never did but I had a very fine time and made some very good friends at the Smithsonian. There

was a couple of other sort of history people who were also involved, so that gave us a chance to collaborate together, as well; one of them being Martin Campbell-Kelly from England.

Walden: He was working with the Smithsonian activity?

Williams: The same sort of arrangement as me; he'd come for a few months and then go back to the University of Warwick where he was from. Similar things like that. Of course Paul Ceruzzi was on staff there at the Air and Space Museum and others as well; there was just a number of them who made it a lot of fun.

Walden: Interesting. So when you weren't there in the summers, you were back at Calgary teaching courses, doing history, and so on.

Williams: Yes. I might still be doing that except for one summer, it was brutally hot in Washington D.C. And of course, Washington can be very humid. At the end of the summer; it was about September, I think; and I was getting ready to go back to Calgary; I was walking into work one morning, because I lived fairly close to the Smithsonian. It was 8:00 a.m. and I was walking through a hot fog; and so I was getting very damp and of course you then walk into the air conditioned museum and you start shivering, and at that point I thought, this is crazy. I've got the worst of the year's weather in Washington, which is living there in the summer time; and I've got the worst of the year's weather living in Calgary in the wintertime; I'm doing it all backwards. And so I just said okay,

you're going well enough, I'm just going to quit; I'm not going to come back here. I was sorry to do that but it was time that I left and let them get on with the job themselves.

Walden: In 1997, you became an emeritus professor at Calgary . . .

Williams: Yes.

Walden: . . . and we'll get to all the other things you've done both before you became an emeritus professor and after, but did you continue to stay active in your department and at the university as an emeritus professor?

Williams: Yes, I certainly did. And I didn't intend to resign at that point in my life. I had thought that it might be nice to resign perhaps at the turn of the millennium or something because my father-in-law had once told me that he was very glad that he had quit working when he did—he quit at about age 59, I think—and he became very seriously ill shortly thereafter and, after fighting cancer for a couple of years, died. And just before he died he said something about he was very glad he quit early because otherwise he would never have had any retirement at all. I took that to heart! I was part of the University of Calgary Faculty Association that was negotiating our contract for the next century. The University came to us during those negotiations and said 'look, we're in a bit of a financial bind and we thought what we might do is to offer some of the old-timers a deal to resign, and thus transfer their income to the pension fund and we can hire two people for what we pay them.' We agreed that this was an interesting sort of thing; and

eventually, we came to terms as to how it was to be done. You had to be over the age of 55; you had to have been at the University for more than, I think it was 25 years and you had to be in good standing in order to take a buyout. There would be so much given to you for each year that you were younger than 65, and so much given for each year of service that you had and the University would keep your benefits going until you reached 65. I still had no intention of resigning, but at one point when all of this was settled, I said to myself, 'wait a minute, I make that age thing by three weeks.' I turn 55 three weeks before the September first deadline and I have been at the university long enough to make the other one, maybe it's time I took my father-in-law's advice and retire. I was pretty frightened to do that because I had no idea, of course, what inflation would bring and we weren't rich, but talking with my wife, she said oh, we'll manage one way or another; why don't you go ahead and do it? So I did and it turned out that I was the youngest person to take the deal, and I had been at the university longer than anybody else who took the deal, and they said I made out like a bandit. I have never looked back. I certainly taught as a sessional instructor; taught my history course for several years afterwards; and did other things around the university. They let me keep my office as long as I wanted, as long as I didn't become a nuisance. And I got free parking at the university, which was a real deal. Oh, and various other things like 25 percent off in the book store and stuff like that. So it was a good thing. I carried on just like a normal professor would, only living on a pension instead of a salary and if I didn't want to do something I just said 'no thank you' and there was nothing they could do about it. [Laughs.]

Walden: Terrific. Do you want to take a little break or do you want to keep going?

Williams: Oh, I'll keep going for a few; how are you?

Walden: I'm fine.

Williams: Just for the benefit of the tape recording here, Dave has a recently broken arm.

Walden: Yes, I do have a broken arm, and I'm just fine. Sitting still is good.

Williams: Okay. Now at that point, I think I got a call from the Computer History people.

Walden: And we can talk about that; let's do. [From the CV] it looks like a couple years later, 1997, you became professor emeritus. In 2001, you became Head Curator at the Computer History Museum. Please tell me about that.

Williams: There was a gentleman who had been a great benefactor to the history of computing. His name was Erwin Tomash, and Erwin had quite a bit of money behind him. He was one of the founders of the Charles Babbage Institute, which is at the University of Minnesota. He had developed a hobby of collecting books on computing and computing related things, and this hobby had sort of gotten out of hand. It got to the point where he had about 3,000 books and other items in what he called his old and rare collection and an equivalent number in modern computing from about 1955 on. Now the old and rare stuff was anything from 11th century manuscripts on up, with a very heavy influence on works from about the years 1500-1700. Some of them were exceeding valuable. At one point — Erwin knew I was interested in books — and at one point he had seen me at a conference or meeting of some kind, and he said he was thinking of

making a catalog and he needed some help. Would I be willing to help? I said oh, sure, because I used to drop by his place in Los Angeles whenever I could, and he and I would play in his library for a fair bit of the visit. At some point, this turned into a much more ambitious project. He went to a book club in Boston, and explained that he was thinking of doing a catalog of his collection. The chap who ran this book club building said 'you see all those books on the top shelves? Those are catalogs of the collections of members. They never get used; nobody ever looks at them. Find something else to do.' And so Erwin thought about this for a long time, and it turns out that he would make heavy use of some reference material, one of which was actually an annotated catalog written by a chap named David Eugene Smith the start of the twentieth century, so it was 1910, or something I think; where he had made a catalog of an equivalent kind of collection but had included as much other information as he could about not just the fact that the book was there, but included information about the author and the contents of the book. This was invaluable reference work for Erwin, as a collector. It's still available; it's been republished several times. Now, between Erwin and I, we discussed this for a long time, and we agreed that if we're going to do it, we're going to do it properly and we came up with a sort of formula where we would have each entry contain the title, the author, obviously, and then the absolutely complete bibliographic information—not just where and when it was published, but even things down to the complete details of the pagination; the collation—which is how the bookbinder put it together—and all sorts of interesting bits and pieces like that. Erwin would do that part and then I would write a text entry, which would start off with something like, "the reason this book is written is . . . " and if you were talking about Galileo or something, I would describe Galileo's

situation:. first all, who Galileo was, his life, and things like that; his situation; why he wrote this book called, for example, *Le Operazioni del Compasso Geometrico et Militare* [*Operations Of The Geometric And Military Compass*, translated into English]; and what happened because he wrote that book—this was sometimes two paragraphs, other times it was two pages. In the end, it took us about 10 or 12 years, but we finished this annotated and illustrated catalog, and it ended up as three volumes, 1600 printed pages. It is available in print and it's now also up on the web. It's hosted by the Charles Babbage Institute, and it's hosted by the IEEE Computer Society because I figured that was the easiest way to make sure that it wasn't going to get lost for a hundred years was to have at least a couple of other people hosting it. Amazingly, a few people are actually using it and even the rare book dealers are starting to quote from it now; not very often but they are starting to quote from it. Well, I was down in Los Angeles working with Erwin. I would take three or four months, drive down and work with him for a while then decide it was time I went home; both of us had gone on like this for a number of years. But while I was down there, I got an e-mail from people I knew at the Computer History Museum in California, in Mountain View, and it said they were thinking of putting a proper building together because at that point it was just a warehouse full of stuff. It was the old Computer Museum from Boston that had been moved out to California, stored in a warehouse, and they were interested in a curator for this effort. I took that to mean that they were after me telling them who were the up and coming youngsters who would make a good curator. So I wrote back saying, funny enough, I'm just about to leave here and drive back to Calgary, I'll just come up that way, stop and we can spend a day together and chit chat. I dutifully showed up in Mountain View, and they said let's go for

supper, because they had a couple of people there from the Board of Trustees, as well. Then I said we should talk about who are the up-and-coming types who you want to think about as a curator. They looked at me and said 'oh no, no, no, you misunderstand; we would like ***you*** to be the curator.' I did a quick shift of gears and as we talked I started thinking, 'this is October, I am driving back to Calgary winter. I don't like this. This is nice climate down here; perhaps it's time I actually stayed down here to see what I could do to help out.' To make a long story short, I did drive back to Calgary but then came back down later, because they weren't ready for me right at that point. They were exceedingly kind. I know of people in the Silicon Valley area who drive for an hour, sometimes even up to two hours to get from home to work; and I just said I'm not going to do that. You're going to have to help me find a place that I can afford within just a few minutes of the museum, or at least the warehouse, at that point. I told them that I've been looking, and if I sold my house in Canada, I couldn't make the down payment on one close by in Silicon Valley. Therefore, I think maybe with those two problems, I'm not going to come. They immediately came back and said, you can't afford a house but I can, because the head of the trustees board was quite wealthy. If you come down, we'll go shopping and see if we can find a place that would suit. I figured they're bending over backwards, I have to do this. So I let my brother-in-law live in my house in Calgary and my wife and I just went down there and I became their Head Curator, and basically helped them take it from a warehouse to a proper museum building with about 120,000 square feet.

Walden: That's the building they're in now?

Williams: Yes. And it was just dead lucky we got it because that was the time of the dotcom bust, and Cisco had just — well, not just, it was about two years earlier — had moved out of that building because they had to fire a lot of people and it had basically sat empty ever since. Cisco didn't own it anymore; they had sold it to some people from Boston. But the people from Boston got tired of paying taxes on it and we got it for a song, and much less than it would've cost to build and equivalent facility. So a few million dollars in modifications later, we had it rehabbed to the point where it became a museum. The next biggest problem was moving everything from the warehouse to the museum, creating storage areas, cataloging everything that we had, because although it started in the Boston museum, by that time, it had grown by about a factor of three as to what we had. And nobody knew what we had, nobody kept any records at all. People would come and dump things in this huge warehouse, and so you'd be clearing out some part of the warehouse and think, what's in this old, dirty cardboard box that's sitting in a puddle and is falling apart? It turned out to be part of the Apollo guidance computer which nobody even knew was there. Somebody had got it and just dropped it off sometime and gone on their way. There was everything from very tiny microchips to things like an enormous IBM Stretch computer and multiple Cray supercomputers, all sorts of things. I spent months organizing that collection, or trying to, with lots and lots of volunteer help, and starting on creating the catalog in the process. We got a primitive exhibit space going, which we called *Visible Storage*. What we did was move things in with enough aisle space so that people could walk around and look, and had a few simple signs in front of things. At that point, I was driving into the museum one Monday

morning, and I thought 'I have to do this for five more days before I can have a weekend.' I don't know why that thought occurred to me, because I was enjoying myself there, but I just said okay, you retired once, you can retire again. When I got in I announced that I was going to retire; and part of that decision was that I think by that time I was getting close to becoming President of the IEEE Computer Society; I was working my way up the ladder, anyway. I thought, I can use my time doing volunteer work for the Computer Society; I don't have to work for a living because I've got my university pension. So we parted company very amicably and I still, of course, retain friends down there.

Walden: According to your CV, you had begun your move up the ladder at the Computer Society, and were moving toward being elected to First Vice President by that time.

Williams: I even remember talking to one of the other presidents, Steve Diamond, who had just stepped down. He and I had lunch in Silicon Valley because he lives there, and I said you know I've just been elected First Vice President. That's usually a step to being put on the list for President and so I want to talk to you about that job. We talked for about an hour and then I finally said, 'was it fun?' He smiled and said, 'that's the question you should've asked first.' He indicated that 80 percent of it was fun, 20 percent of it was absolutely aversive, but by and large it was good. I said, 'would you recommend other people try?' He said, 'absolutely. Go for it.' So I thought about it and realized that I could not have easily held down a job at the museum and do these other things, so it was about time I quit the museum.

Walden: Just another thing about the Computer History Museum, presumably as they move from a warehouse to a big building and began to have real exhibits and so on, were they also staffing up or were they already staffed when they were in the warehouse?

Williams: There was some administrative staff but there were only about 3 of us as the technical staff.

Walden: Were you involved in helping bring that staff in?

Williams: On occasion I was, yes. I made it quite clear that when I took the job, my job was to deal with the things and not the administration or fundraising. I said I'll come out there and put on some white gloves, and demo something in front of a big source of funding, and then I'll leave you to do the ask. Basically, it was the same; that we would talk and I would say that what we really need is an archivist, or this paper is getting out of hand. Since my specialty is not archival things, I would leave it to the Board of Trustees to hire a decent archivist and then I worked quite happily with her afterwards.

Walden: Let's change topics, to the topic into which we'd begun to drift just a minute ago, which is how and why did you first get involved in professional societies?

Williams: It's sort of interesting; at one time I was a member of quite a number of them. When I was in graduate school in Britain, in Scotland, I was a member of the British

Computer Society, and I actually became a Fellow of the British Computer Society. I was a member of the ACM and the Canadian Information Processing Society. I refused to join the IEEE because that was for engineers and I didn't like engineers. I was, if nothing else, a pure scientist and historian; a pure mathematician and historian who just doesn't like what engineers do, so I didn't join that group at all. Now, I mentioned earlier about this history conference at Los Alamos, the very first one that was ever held. Over supper, sort of an informal gathering, there was talk about lots of different things, but one of them was that we should have a journal. There was sort of preliminary talk about it; eventually I think Bernie Galler was the chap who lead the discussion and said okay, let's do this and he became the founding editor of the *Annals of the History of Computing*. That wasn't at the Los Alamos meeting, it was a couple of years later, that they got their act together.

Walden: Which at that time was an AFIPS publication.

Williams: Yes. AFIPS was the publisher, because they had the broadest background. Now, at one point, somebody — I can't remember who it was — probably JAN Lee—his name was really John A. N. Lee, but he was always known by his initials—contacted me and said are you going to the conference to be held in Las Vegas? It was one of the huge conferences that used to be held twice a year; there was a spring one and a fall one, they called them the National Computing Conference, it was, the NCC.

Walden: NCC, sure.

Williams: I said something about I was thinking of going. He told me that there's a history session there about Howard Aiken and they need somebody to take some notes and write it up for the *Annals*. I think at that time he was some lowly scribe for the journal himself, and he said we need to have this write-up, could you do it for us? I told him that I've never done anything of that sort but he still asked me to give it a try. So I doodled around; I took a notepad with me and I scribbled and scribbled and scribbled for the afternoon, and I sent it off to the *Annals* and they published it. Now, when I stop to think about it, that may be where I.B. Cohen first had any dealings with me, and he's the one that got me the job in the Smithsonian, because he was an expert on Howard Aiken, who was at that meeting, and probably saw my write-up. Now, it's always been the case that if you're asked to do something and you actually do it reasonably well and don't goof it up, they'll ask you to do something else. You've seen this phenomenon before.

Walden: Yes, of course.

Williams: And so before long, people were asking me to write up something else. At another NCC conference meeting, I remember they were having a side session on history or something or other, and that went on several times. And then AFIPS broke up and it was what to do about the *Annals*. I wasn't involved in anything, except in the most junior way. But JAN Lee was, by that time, the editor-in-chief. AFIPS gave up; or was it still Bernie Galler? I can't remember; it doesn't matter; the editor-in-chief at the time moved the publishing to Springer, who then published it for two, three years. Then Springer did

something very strange; it's probably not strange for a commercial company, but it was strange from the way that we had any dealings before. If you wanted to have a personal subscription to the *Annals*, it was fairly low in price. If a library wanted to have it, it was quite high in price. Now, that's standard, but the way Springer interpreted that is if the address that you had the *Annals* shipped to was a private residence, you got it at the low price. If it was shipped to a university — as a lot of professors have their journals shipped to their office — then suddenly they charged you the library price, which was 100 times what the personal price was. And most of them immediately cancelled their subscription, so the *Annals* was suddenly in trouble and Springer didn't seem to care. So JAN Lee had been interested in, and involved with the IEEE Computer Society before, and he suggested that perhaps the Computer Society would take over publishing of the *Annals* and made a very passionate plea to them. And they eventually said yes, they would do it. So suddenly, *Annals* became part of the publishing of the IEEE Computer Society. Now, at that point; yes, at that point; JAN Lee took over as the editor-in-chief and he phoned me up and he said, we have problem, we haven't got anything to publish. He said he had gotten stuff from Springer, there were no papers in the pipeline at all, and they had — whether in retaliation or what, I don't know — destroyed all the back issues of the *Annals* that were in their possession; stuff that had been shipped to them from AFIPS. So you couldn't buy any back issues of the *Annals* at all, so there were very, very few complete runs of the *Annals* anywhere. And he said, 'what are we going to do?' Incidentally, he said, 'I want you to be my assistant Editor-inChief'. Your assistant? And then get you out of trouble? He said get ***us*** out of trouble. I suggested that we might start by him writing a paper; I'll write a paper; we will find something we can publish that has been published

elsewhere and basically we will fill out an issue. JAN said that's not good enough because we're already late for one and the next issue is coming up. So I said 'good, we'll make it combined issue,' and JAN and I sat down and tried our best to write something, a research article each. I can't remember who found it, either JAN or I, but we found stuff that von Neumann had done, and we published that. We also later discovered that it previously had been published in the *Annals* and we hadn't recognized it. But, you know, somehow or other we got it limping along and JAN said 'look, it's time you came to an IEEE Computer Society meeting with me to see what's going on.' So as long as somebody was paying my way I said I'd be happy to, and we went to a meeting in San Francisco. JAN had to make a passionate plea to the Board of Governors of the Computer Society concerning something or other; oh, I know, it was a history of the Computer Society, when it was formed, things like that. I sat on the sidelines and all of these big powerful, important people sat at a big U-shaped table, around are all the members of the Board of Governors, the President and Vice President I think sat at the far end, and I can remember the thought crossing my mind that 'oh, gee, it must be quite interesting to be a powerful member of the Board of Governers.' Basically, I just listened to JAN and then we went off and did something else. That sort of got me sucked in and when JAN had finished two terms as Editor-in-Chief of the *Annals*—by IEEE rules, he could only do a maximum of two terms than he had to step down—I said 'okay, how do I apply for the job?' I filed out no end of stuff and sent it into the IEEE, and I never heard a thing. Nothing! Months went by, never heard a thing.

Walden: And when you say IEEE, you really mean sending it to the Computer Society?

Williams: Yes. I'll try and be more careful about that. At one point, I phoned up JAN and said, so who did get to be editor? They had to have made a decision by now and I'd like to know. And he said, can't tell you; not public yet. Okay, when will it be public? He said, you'll know before too much longer. Another month went by, I think, when somebody at the Computer Society finally realized they hadn't told anybody who the editor was and it turned out to be me. I got phoned up and it's probably because I asked JAN Lee what was going on, and he passed it further on; said somebody better tell him he's the editor before it goes too far. I had no intention of doing anything other than the *Annals*, I was a historian by this time and that's all I was interested in. But it turns out that after doing this for four years, that was two terms, there was a lot of very interesting people I met and at one point, my term was coming to an end and I had done as much as I could to prepare other people to take over, including beating them with sticks, almost, because nobody seemed to be very anxious to do so. But it was about the last meeting I was in, and there was always a hospitality suite at these meetings; so I was up at the hospitality suite after all our business was over, and there was a woman there. I had no idea who she was; sitting down beside here and making idle conversation. I said you know, I really enjoyed this time as EIC of the *Annals*. How do you keep doing other things with the Society? She said oh, you want to do more work? I said that I thought that might be fun. She said, well, just leave it; so that was the end of the conversation. I had no idea that I was talking to the person who was the head of the nominations committee for other jobs. I honestly had no idea at all, but before long, I was asked to do a couple of other things and then, as I said before, if you do even a half-heartedly good job they'll

ask you to do something else. And after; let me see, I was Editor-in-Chief of the book publishing program for a while; and then they asked me to chair other publishing related committes and eventually I was appointed as the Vice President of Publications, because that's a Presidential appointment, it's not an election.

Walden: Who was the president, do you remember?

Williams: No.

Walden: Never mind.

Williams: No, I'm; I don't know; but it probably wasn't the President that doing a lot of the actual stuff. The Publisher at the time was Angela Burgess and Angela and I got along quite well, and probably when it came time for the President to find somebody, Angela probably said well, there's Mike. And so I got in that way. But somehow I became the Vice President, Publications, and the first meeting, they had to find somebody to go to the IEEE level and represent the Computer Society in the IEEE Publications Board. Traditionally, if you're Vice President of Publications of the Computer Society, you represented the Society at the IEEE level Publications Board. Now, it turns out that there was somebody else who would have liked to have done it, Jerry Engel, who was becoming a quite good friend of mine, he was the President of the Society himself; and he and I had to go outside the room while the Board of Governors had a long chat about us both. I think somebody finally said, look, it's the usual thing that our Vice President of

Publications represents us so why don't we just do it that way? So it turns out that it was me that went to the IEEE and not Jerry. Well, this brought forth a problem and that is because I was an only an associate member of the Computer Society. I wasn't an IEEE member; I never wanted to be a member of an engineering organization. And it's a bit unreasonable to sit on the board of an engineering publication if you're not a member. So I said something to Angela Burgess and she said 'shut up and get a membership right away,' which is precisely what I did. I became a real IEEE member and then spent quite a long time on various boards and committees of the IEEE, as well as the Computer Society. And again, it was the thing about if you seem to be doing something reasonably well, they'll ask you to do something else. Whether you're qualified to do it or not doesn't seem to matter. And so I moved around a fair bit, not only with the IEEE Publications Board but with their Regional Activities Board, later called the MGA, the Members and Geographic Activities Board. They were looking for somebody with publications experience to be the liaison, and so I could sit on their board as well, and through that I got to sit on various other of their committees and things. And as you know, I eventually, actually won election to the Presidency of the Computer Society.

Walden: Help me with that just a minute. You became First Vice President. Is that the position that you get before you get to be President? Or is that a position before the position?

Williams: No, it's an independent position.

Walden: And you ran for that office or did someone ask you to run for that office?

Williams: No, I ran for that office, at one point. No, no; wait a minute; now you've got me confused. No, I was appointed to that office.

Walden: It says elected to First Vice President.

Williams: Okay, in that case, I must have run for it.

Walden: So you wanted the job?

Williams: Yes. I liked the publishing stuff. Now, when you say run for it [pause]

Walden: There's two things; there's elected to the Publication Board, appointed as Vice President Publications first, elected to the Publications Board of the whole IEEE, and then elected First Vice President of the Computer Society.

Williams: Yes. Now the elected to the publications board was as the representative from the Computer Society—the election was done by the Computer society Board of Governors.

Walden: Yes, great.

Williams: And I probably let my name stand for the First Vice Presidency. I didn't do anything other than let my name stand at that time, and I think it might've changed a bit now; but at that time, it was considered rather gauche to do any electioneering. And so you simply let your name stand, you wrote a couple of paragraphs about what you thought should be done, and then you just stood back and wait until people cast their ballots.

Walden: And the First Vice President is a position that is not yet President Elect?

Williams: Correct.

Walden: Okay, so what does the First Vice President do?

Williams: The First Vice President, if he's elected, traditionally he gets to do anything he likes. And so I said I would like to continue on with publications.

Walden: Okay. Then you obviously ran for president, starting as trying to get to be the President Elect, and then the President, and then the Past President.

Williams: It's really only one election for all three posts—if you are elected to the post of President-Elect then it automatically follows that you will move on to be President and Past President.

Walden: I understand. So you're running for the President Elect, which will shortly get you through the series of three.

Williams: Now let me say again, you don't do anything, or at least I didn't do anything, I simply let my name stand and I wrote a position, a few paragraphs.

Walden: I have your presidential statement when you were running for office.

Williams: Okay, that's all I wrote, I think.

Walden: And I'm not quite sure what year this was in, but I guess it's the year you were running for President Elect. You were competing against a fellow named Yervant Zorian?

Williams: Yes. And I was told afterwards that I was the sacrificial lamb because I was an academic and Yervant Zorian was the practicing engineer, and practicing engineers always won. I was meant to be the sacrificial lamb and nobody was more surprised than me and Yervant when I won and not him.

Walden: Well it's a very interesting pair of statements. He speaks about the good of Society--I'll serve the members; quite a traditional presidential statement. You speak about basically "the society's in trouble and we need to do a lot to fix it," and presumably some of that came because you're interfacing with the whole IEEE, you're involved with

publications, you know Angela, and so on; and I'm wondering to what extent the members somehow thought, "oh, we've got somebody who thinks it's in trouble and it needs to be fixed. Maybe we should get that guy rather than the guy who's saying let's keep doing good services."

Williams: It's entirely possible. I mean, everybody who casts a vote probably has a different rationale and, of course, there are only a very small percentage of members who actually cast a vote.

Walden: When I read this, it's quite a startling set of contrasts between the two statements.

Williams: I suppose it is.

Walden: And then your first presidential letter in *Computer* is "this is the year we have to decide things."

Williams: Yes, that was; the Computer Society was starting to lose money. The year before, we had run a considerable deficit and before, there was really no deficit ever. That may not be exactly true but the finances were always in good shape. We had a fair bit of money in reserve but we still ran $500,000 or something in deficit. This is not my style; I don't like deficits. I used to joke with people because the president has a great deal to say about where meetings were held, and there's always about three meetings a year. Now, in

those days, you could basically specify where those meetings are held and my predecessor had held some in Hawaii, and there were people who held them in all sorts of interesting places. I used to joke that I was going to hold them at the Motel 6 in Pierre, South Dakota and this actually became a running joke. A number of people have mentioned it to me recently, although they never think it's Pierre, they think it's someplace else. However, it was my idea that it was time to tighten our belts and stop spending. Angela Burgess was also of this ilk. Now, we had gone through a tough time earlier. There was at one time, an Executive Director of the Computer Society, back about the year 2000 — I can't remember exactly — and this Executive Director, named Michael Elliott, was a no-nonsense individual and liked being the Director of a large organization. He had worked for Bill Clinton in Alabama; he was on Bill Clinton's cabinet there, I think, in some respect. He basically ran the Computer Society and he ran it as an independent entity. Nothing was ever referenced to the IEEE as a whole, or seldom anyway. All the decisions were taken internally and had been done that way for quite a number of years. The IEEE needed a new executive director themselves.

Walden: The I-triple E?

Williams: The IEEE; the big boy, the big boss needed to be hired. They hired a fellow named Daniel Senese. About a year or more went by; and I don't know why, but Dan started asking questions about Michael Elliott and why is he spending this money, and how much is he making? And he requested that Michael Elliott send him a copy of the contract. Michael did. If your titular boss asks to see the paperwork, you send him the

paper. Well, I'm not sure, but I think it probably turned out that Michael Elliott was making more money than Dan Senese was. I'm not sure about that but there was certainly stuff in there that was causing a great deal of friction and somewhere, somehow, somebody suggested that Michael Elliott had his fingers in the financial pie. He was called on the carpet and fired. Michael Elliott sued the IEEE and after about — I think it must have taken something like a year — the IEEE suddenly realized that they were the ones that were in the wrong. Dan Senese left the IEEE and Michael Elliott got an out-of-court settlement. The out-of-court settlement said you must not have anything to do with the Computer Society from this point on and you cannot be associated with the Society's governance, you cannot run for office, and similar restrictions. And here's a pot full of cash; we're sorry we did the wrong thing to you. Now, Michael Elliott did come to a final Computer Society meeting, made a speech thanking everybody for their support, and he said that because of the confidentiality agreement, he cannot tell us how much he got, but he said 'let's put it this way, I need not work a day in my life from this point on.' Now, that was alright, okay? The Computer Society would get over that but they were miffed.

Walden: This came out of Computer Society funds or IEEE funds?

Williams: That's what drew the icing on the cake; the IEEE charged it to the Computer Society and that ***really*** put peoples' backs up. So there was a lot of problem there for a few years, and finally, when Angela Burgess became; there was another person who was executive director for a few years in between; but when Angela Burgess finally became Executive Director, she said okay, that's water under the bridge, we're missing out on a

lot of stuff by not cooperating with IEEE. And that is the same time that I was President; because it was in my watch that we had to hire Angela. And at that point, it was okay, let's just call it quits; it's water under the bridge; we will now do our best to cooperate in every way we possibly can. We will even make one of our yearly meetings jointly with IEEE so that they can see what we're doing and everybody can meet everybody else. If you get to know the other people, it's often a lot easier; and it was the fact that we had also lost half a million dollars the year before. Now, I came out, the end of my year as President with a surplus. Not much, it was $50,000 or something, but it was a surplus. And I think for several years thereafter, there was nothing but deficit after deficit after deficit. I don't know what the situation is today, but the membership is falling; the income from traditional journal sales is falling; but that's universal. They're doing their best to fight it off. There's a real good financial man at the Computer Society now, who was hired by Angela Burgess when she came onboard as Executive Director. He has been guiding us over the years but I have been out of the loop so I don't know about the financial situation for the last few years.

Walden: If I have the timing right in my head, at the time of the Michael Elliott firing, you were still a little ways from being President, so you were watching it a little bit from a distance, or at some meetings.

Williams: Yes.

Walden: And then there was another executive director for a little bit, and that person left while you were the president elect . . .

Williams: Correct.

Walden: . . . and Angela had not been hired yet, so she was . . .

Williams: Still the publisher.

Walden: . . . still the publisher. So you presumably also went into that year as the now actual president with an attitude of "let's try to get along with the IEEE"?

Williams: Yes, I think I probably did; but that's because I took my cue from Angela who was very good about this. We had long talks and there were a couple of us who thought Angela was an exceedingly good person to guide and to actually run the Computer Society. She had just recently completed an MBA and she probably knew more about how the IEEE and the Computer Society worked than anybody else. We had a job search in which the legwork was done at the IEEE level by their staff; and there was about four or five people on a short list including Angela, some of whom were very, very good. It came down to three, and the selection committee had to meet in Washington, D.C., and we were going to have supper with each of these people, just to see if they could use the right fork, at the same time as well as being decent administrators, and, you know, didn't blot their copybook in any way. But we didn't have time to meet with Angela, and so we

scheduled a lunch with Angela. Now, Angela said afterwards, that as soon as we did that, she realized that this was *pro forma*, that she was not to have the job because if she was going to have the job we would've done supper with her like we were doing with everybody else, at a very fancy hotel, instead of a quick lunch in a not all that fancy a place. It was also a long weekend; probably President's Day or something; I can't remember. She said, you know, had they been polite and said look, you're not really in the running so we won't bring you out here; enjoy the long weekend with your family. She said she would've actually appreciated that and thought that we were all rascals because we didn't do it that way. And so when we all got together after this and had a vote, and Angela was the clear winner, we got a speaker phone in the middle of the table and phoned her up and said, Angela, how would you like to be Executive Director? And she almost fell apart because she was absolutely so certain that she hadn't got the job. All the signs were wrong. But it's just that she was so good that I don't think that we had to worry about it, except perhaps for one person on the selection committee who didn't really know her and did their best to derail her selection. Interesting, but she was outvoted.

Walden: I'm curious about how you see the whole operation functioning. There's the President Elect, the President, and then the Past President, and you're only President for a year, and the staff is basically running operations . . .

Williams: That's right.

Walden: . . . it seems hard to get things done In, for instance, your first letter in *Computer*, you talked about how Carl Chang, several years before had said there needs to be transformation; but then what's happening through the sequence of presidents until you get to be the President Elect (and you're not even the president yet). How does all that actually work in terms of having some consistency in getting things done?

Williams: It's very difficult. And basically, the president is more of a figurehead than anything else. As you said, the staff runs the show. Now, technically, the President does have some powers. It was always my view that the Executive Director deals with staff matters, and if the Executive Director wanted to hire somebody or fire somebody, that was their responsibility and the President should have nothing to say about it. A few presidents in the past had tried to intervene when somebody was being fired, or was threatened to be fired, or something and this often lead to disaster. It's because the President doesn't know what's going on, on a day-to-day basis. The Presidents and Vice Presidents certainly have influence on the strategy and the direction, and if the Board of Governors says we will do this, then the staff will simply do it.

Walden: So they then have to figure out how to implement it?

Williams: Yes, and sometimes it's not easy. I know at one point I was at one meeting in Vancouver where there was a very, very contentious argument that went on for several hours. It was about where the headquarters should be and how it should be run, and Angela Burgess had booked a plane back to Los Angeles and she had to leave while this

argument was still going on. She thought the meeting would be long over by that time. She finally decided she had to leave and she looked at me and whispered in my ear, saying if this motion passes you're looking for a new one; you know, that I'm quitting; and then walked out. I don't think anybody else has known about that but; you know, sometimes it gets a little tense, but usually there were very good relations between staff and the executive and the volunteers. There was one problem when I was President, which I want to tell you about just to get it on record. I, of course, had things that I wanted to do, and one of the things that basically had been quietly arranged amongst the various staff was we had this beautiful old building on Massachusetts Avenue and Embassy Row in Washington, D.C. and IEEE U.S.A., the American version of the IEEE, was headquartered in Washington and so were we. Our publishing was done in California but technically the headquarters was Washington. They had sort of agreed amongst themselves (because the IEEE was having to renew a lease) perhaps IEEE-USA should move in with us. We owned the building, they could pay rent, and everybody would be happy. We would have to do some renovations to that building and so the engineers were called in to see about the renovations. There was not only the big building but there was a office complex at the back that nobody ever saw, like a sort of coach house or something, with a bunch of offices and things in it and we weren't exactly sure how to modify this. At one point, my phone rang and it was the head staff financial man at the IEEE who asked if I was going to a meeting to be, I think, held in Portland next week. And I said, yup. Well, actually, it was three or four days from that point. He said, good, when you get there, look me up, I must talk with you immediately. What's it about? Don't worry, he says, look me up right away; don't want to tell you about it on the phone. Oh my God,

what's happened now?! So I get to, as I said, I think it was Portland, and found the hotel; and asked around where this fellow was. He was in a meeting but I walked into the meeting and I could see him there so I went over, tapped him on the shoulder and said what's wrong? We went out in the hall so we got a nice quiet place to talk and that's when he said that he got the report from the engineers and they had said that the electrical system was shot and there was going to be a fire before long. And that is, if the carbon monoxide from the heating system didn't kill anybody first. In fact, they had condemned the building and we had seven days to get everybody out.

Walden: The engineer condemned it, or the fire department, or somebody had heard this report?

Williams: Somebody had [pause]

Walden: I guess if you're a professional engineer you have to report unsafe places to the authorities.

Williams: Probably. I don't know how it happened; I just knew we had to get everybody out. And he said you've got a few days to find someplace to put your staff. Oh dear. And that basically, not ruined, but made all my plans come to nothing because the rest of my presidency was circling around that and all of the chaos that came from it. Now, it turned out there were holes in the chimney and things, had holes in the furnace, and at some stage in the past — and this might have been long ago — somebody had decided they had

to put lightning rods on the roof, and had run the grounding wire down behind the fire escape at the back. It was a metal fire escape on the back of the building and to do that, they had unscrewed the fire escape and had run this line but then they had forgotten to screw it back on again so that had there been a fire and had people tried to leave on the fire escape it would've collapsed under all the weight. It was just one thing after another, after another, after another like that; there were also fire escape routes that were blocked. The building had undergone quite a number of renovations over the years and it was just an absolute mess. It turns out that we had to either basically tear it down and rebuild or spend a very large amount of money in an attempt to rehabilitate it. If we tore it down, Washing ton DC regulations said we had to keep the front façade. The head employee, the Executive Director of IEEE U.S.A. and I went around to see the architects and we had several meetings with them about what could be done and roughly how much it was going to cost. I can remember it was between $7 and $9 million. Eventually, it came down to having to make the decision; I wanted to actually stay there because it was a nice building, nice address and everything else. The rest of the Board of Governors decided that we shouldn't be in the real estate business, that wasn't our job and they voted to sell the building, which I accepted. That was a reasonable decision. It didn't go the way I wanted it to but then we didn't have a spare $9 million on hand so this was perhaps the most reasonable decision.

Walden: Where had the staff gone before the week was up?

Williams: They had tried to move in with IEEE U.S.A. So instead of them moving in with us, we moved in with them and we certainly didn't have enough room for both organizations. We were stacked in hallways, and we were sharing offices, and all sorts of things. They were very good about it, they couldn't have been nicer, and they really saved our bacon. But then followed no end of trips around Washington, looking at real estate. There were buildings that were being built and we could move in; and there were other buildings that were already there that were being renovated that we could move in, and I can remember Angela Burgess and I, a few others, including people from IEEE, traipsing around Washington D.C. just looking for someplace and finally, I think it was Angela and the IEEE U.S.A. who said this is the best one. I sort of said you have to live in it; you go ahead and make the decision.

Walden: So IEEE U.S.A. went to the new building, too?

Williams: Yes.

Walden: So you did share a building, just not the building you intended.

Williams: We shared a floor on a bigger office building. It wasn't the building we intended, but everything worked out in the end. That took a huge amount of my presidency; took my eye off of no end of other goals.

Walden: During this time, if I read your reports to the Board of Governors, or your informal newsletters that you sent out, which I have, you're also struggling with the IEEE and Computer Society financial treaty. Was that your doing that or was Angela mostly handling that?

Walden: It was mostly Angela and the finance people on either side. We actually had several rules, and one of them was that if you have or if you run a deficit, and can't remember the exact rule, but I think it's two years in a row or something, three years in a row perhaps; then you're put on what's called a watch list. While everybody is, or at least was at that time, running around saying oh, we can't go on the watch list that would be terrible; it turns out to be a paper tiger. And we have been on the watch list, I think, ever since because we hadn't run enough positives in the budget.

Walden: Some ways, it's just bookkeeping. You're either a deficit or not.

Williams: That's right. The IEEE also had a very peculiar financial situation where most of their library sales of things, journals and other publications, come in at the very end of the year and we were running this terrible deficit, and then suddenly at the very end of the year, sometimes in the last two weeks, all of this money would flow in. You can't do anything with it simply because there isn't time, and so you end off the financial year, perhaps with quite a bit of money left over and that money will go into your reserves. Now, when you're on the watch list you can't spend money out of the reserves; under certain circumstances you can but usually it's no, you're on the watch list, you can't

spend your reserves. So that results in this peculiar situation; we're running deficits and the reserve fund is growing every year. Now, a lot of that has been changing slowly over the years, to the point where the IEEE is getting their finances in a little bit better order but there's still that kind of stuff that causes very difficult budgeting and very difficult financial tracking with both the Computer Society and the IEEE.

Walden: So you cease to be the President and became the Past President, did the new President continue sorting all this out?

Williams: Yes. The new president was Rangachar Kasturi. Now [pause]

Walden: You mention him in your final *Computer* article of the [pause]

Williams: Yes, he is a good guy; I have great respect for him. He is a professor in Tampa, Florida and I think he's one of the smartest men I've ever come across, and the hardest working. He is so workaholic that at one point, he and Angela Burgess used to compete as to who would send e-mails at 2:00 in the morning to one another. Angela had to finally give up because she was so exhausted she was going to end up in the hospital, or worse. Rangachar just kept doing it. Everybody calls him Kasturi. Rangachar, I think, is kind of an adoptive name because when he came to North America, he discovered he needed a given name, as well as Kasturi and so he just adopted Rangachar. But to get back to your question, as President Elect, you do a fair amount of stuff. A lot of this is internal chairing of miscellaneous committees; you chair this appointments committee;

and you chair; you've gotta read the constitution, but you chair an awful lot of stuff. And when you become president [pause]

Walden: Presumably that gets you up to speed.

Williams: It certainly does help. When you become President it's very often the case that you spend an awful lot of time going around shaking peoples' hands, so you're often more of a figurehead than anything else. My wife kept track, and I was away from home 157 nights in that year, so about half the time. An awful lot of that was going to some conference to present an award to somebody or other, and so you leave, say, today to fly someplace; the next day to attend the conference, present the award; and the next morning you fly home again; you'd have one day at home; and the next day you fly someplace else again. It's not all like that but there was a lot of that kind of stuff, and there was a lot of other stuff, too. For example, there was a computer pioneer named John Vincent Atanasoff, who was born in the US but his parents came from Bulgaria. The Bulgarians are very proud of him, and have issued stamps, and all sorts of things with the fact that he's a computer pioneer on them. His family tried to make an argument that he was the inventor of ***the*** computer—legally, in the US, that is correct because it was the result of a verdict in a patent lawsuit, but the needs of patent lawyers are not the same as the needs of an historian, so you'll find historians will often say that it's not quite correct. But Carl Chang—Computer Society President in 2004—is from Iowa State University, and that's where Atanasoff worked as well, at least for part of his life. Because of that, Carl Chang was very interested in trying to get an Atanasoff Prize established by the

IEEE. You have to give about a million dollars to the IEEE to set this Atanasoff Prize up and Carl, with a bunch of other people who are well connected in Bulgaria, got the Bulgarian government to agree to fund a million dollars. Now, getting them to agree to fund a million dollars and actually getting the million dollars are two different things. It went for several years with 'oh, well, we've got to get it approved by so-and-so; and yes; in the meantime, it's in somebody's bank account.' Eventually I was part of several delegations that Carl Chang had going to Bulgaria. There was a big conference in Sofia, it was to celebrate Atanasoff; there were arrangements made to meet the Bulgarian President, and things like that. And that was during my presidential year and so I was along there, and making speeches at the conference as well as shaking hands with the President who didn't care who any of us was. He wanted to get out of there as fast as he could. I don't think that money has arrived to this day, and I don't imagine it ever will. There's a lot of that kind of stuff that you do as President. As Past President, there is also a lot of sort of internal stuff, and it's all laid out in the constitution; what you chair, and when you do this, and when you do that; but there was also a few things where you had to go up and shake hands again. In my case, it got a little more complicated because I was known at the IEEE level as well, and so I was sitting on various boards and committees at the IEEE level, and even maybe the year after, there was a couple of instances where the IEEE President was to go and present a medal to somebody and couldn't for whatever reason, and so if it was computing related it tended to be me that got the phone call saying, what are you doing on Thursday? Can you get to Palm Springs for me? This kind of thing.

Walden: As the president, are you in touch with the Executive Director daily? Weekly?

Williams: Oh, pretty much daily or every second day. There's occasional times when; we agree to have a down period for a couple of weeks; I think we're doing alright here; or there's no actual crisis at the moment. But I was certainly in touch there every few days with the Executive Director, either the one preceding Angela or Angela. The one preceding Angela was a chap named David Hennage, who was a very pleasant man. I don't think he was the right man at the right time, but he was certainly pleasant to deal with.

Walden: I'd like to move on from your IEEE and Computer Society activities. Before I do that, I'd like to mention that you were; you did continue with the IEEE, you did continue with the Computer Society in various committee roles; as chair of the IEEE History Committee, as a member of the Computer Society History Committee, and so on.

Williams: Yes. In fact, I chaired the IEEE History Committee twice in my career; once in the 1990s and once in the 2000s; I forget whether it was 2009, or something. So I've been involved with them for a lot of times.

Walden: To change topics a bit, you mentioned for instance, a Martin Campbell-Kelly. When I look over your CV, it seems you've done a number of things with him and it looks to me like you've had repeat collaborations with other people upon occasions; or certainly collaborations on books, and so on.

Williams: Yes.

Walden: Can you speak a bit about that collaborative aspect of your doing history?

Williams: This usually started with a historian named Bill Aspray. Not always, but Bill was always in the middle of it, or often in the middle of it. And Bill would do things like he would say, 'you know, it would be really nice to have a book that included this, and this, and this, and this; and, you know, like you could do a chapter on calculating machines, and Martin could do a chapter on something else; and Allan Bromley from Australia could do a chapter on Babbage and his difference engines. You know, there's this conference coming up and we could all meet at the conference and have breakfast together and discuss this.' By the time it came time to have breakfast together and discuss this, it was sort of a *fait accompli*, well, we're going to do it, folks. What's the timeline and who's going to organize it? It was often Bill Aspray that would organize it. There were other groupings here, too, because Bill Aspray and Martin Campbell-Kelly collaborated on a book called *Computer*, and Paul Ceruzzi from the Smithsonian has collaborated with all three of us at various times. And certainly, when I went to Australia I did collaborate with — I'm having a senior moment, his name is gone — Bromley, Allan Bromley. But I did look him up and spent a couple of days with him just before he died, unfortunately. I'm always willing to throw my hat in and join with somebody else. I have seldom started any joint venture myself, it's usually been at the behest of somebody

else; come and join me, which I gladly will. But it doesn't seem to be my nature to sort of start these collaborations myself.

Walden: I'd like to ask you a couple of questions that maybe we can pull out of this interview if you want to, later; but just because I'm looking at the history of the *Annals*.

Williams: Okay.

Walden: And I've got you here; and somebody will transcribe this so I can read it. There's a general question, then a specific question. In the early days, I think, of computing history, a lot of people came from the world of computers and sort of drifted into history. It's your case, it's Martin Campbell-Kelly's case, it's the case for others. Increasingly these days, the historians of computing science study history.

Williams: Yes.

Walden: And are not out of the computer world, although may have an undergraduate degree in computer science, but perhaps they never really practiced it.

Williams: Right.

Walden: And the other question is, the *Annals*, it's clearly increasingly dominated by what I'll call the professionally trained historians.

Williams: Yes, very much so.

Walden: What's your view of the historians who didn't come from the practitioner role, either the teaching world of computer science or the engineering world of computer science sort of dominating this field, now?

Williams: It certainly changes the whole complexion of the field. The early engineers and computer scientists were more concerned with the internal history, as it's called. Who built what? How did they build it? What equipment did they use? What vacuum tubes? All of the minutiae of detailed technical stuff. The modern trained historians coming out of the history of science program usually do not understand any of the highly technical side and because of that, they are not interested, and what they are interested in is the social impact that computers have had. Now, I think that particular aspect, obviously, the computer has had a huge social impact, but I don't much care. I'm more an internal historian.

Okay, so it really is a different complexion to everything and occasionally, you find the engineer making completely ridiculous statements about societal effects and you find the social historian making completely ridiculous statements about technology. That was brought home to me when there was a, I think it was the M.I.T. Press, and it was a book called *Portraits in Silicon*. They sent it to me to review the manuscript and advise them whether it was reasonable or not. I sent back just a scathing review because this fellow had tried to talk about Babbage and his technology. He was obviously a good writer; it

turns out he was proficient writer and had worked for some famous newspapers and magazines and things. But he did not have the slightest idea of what was the difference between analog and digital; and if it was mechanical it had to analog, you couldn't have digital mechanical stuff, which you could have if you do it properly, you know, as Babbage did. And there was no end of things of that kind, and I just told them that if they published this thing, then you're going to be a laughingstock. They phoned me up afterwards and they said we really want to publish this book. Would you consider working with the author to correct all of this? I said well, it's like rewriting the whole thing—I can't remember, they must have paid me for it because I wouldn't have done it if they didn't. But I remember working with the author; it turned out to be quite pleasurable; he wasn't the least bit — at least not that I could tell — the least bit mad at me for slamming his work. We went through several drafts back and forth until we got it into what I considered reasonable shape. But you certainly do get that when somebody who doesn't understand the technology tries to write about the technology. At one time, there was a Time-Life series of books on the computer; about a dozen—no, about 25 volumes, I think. I don't know how it happened but somehow or another I got associated with that; not to actually write it but to be an advisor. And that's when I discovered how they write their books. They take a professional writer — doesn't matter if he knows nothing — they put an expert on bringing up your infant child, and he'd now be told to write a book on how digital data processing works. He would write something and it would be absolute garbage; and you would tear it all apart, send it back, and he would rewrite it. It would come back better but still garbage, and you would tear it all apart, and

you'd go through that four or five times, and by the fifth time it was starting to look fairly good. He was an expert writer and could write things fairly well.

Walden: He was probably learning.

Williams: Oh yeah. And he needed somebody that had the technical expertise to tell him this is not right, this is how it's done. And, of course, they had a formula that they used for doing it. He knew the formula whereas you probably wouldn't. However, there were still some things that slipped through; they were doing a second edition of some of these things, and they asked me to look over one of the books very carefully, see if I could find any problems. I discovered it was about storage, and there was magnetic tapes and disks and things, and they had this beautiful drawing — they were beautifully illustrated, these things — of a magnetic tape unit and showing how it worked and they put the magnetic coding on the tape on the wrong side. It wasn't next to the read/write head, it was above the read/write head instead; and it was only by chance that even I noticed that, and when the next edition appeared, in fact it had been corrected. They had probably redrawn the whole thing, I don't know. So you get useful stuff from both, but they're different. I now find that there's not as much stuff of interest in the *Annals* as there used to be for me; I used to read every word cover to cover; and now I only read about half, I suppose. And if it's talking about some place or thing I'm not particularly interested in, I just read the first two paragraphs and then set it down; no, I'm not interested in that; go on to the next article.

Walden: You mentioned the Time-Life series. Another series for which I guess you were on the editorial board was the Babbage reprint series. Can you say a word about that?

Walden: Ah, yes I can. Martin Campbell-Kelly was the chief editor, head of the editorial panel. I was started from Erwin Tomash's private collection of books. I'm not sure how it got started but somebody must have mentioned at some time that they'd been looking for a particular book, or reprint, or something and they couldn't find it anywhere. And so Erwin Tomash decided that perhaps he could take some of his volumes and reprint them, either photographically or have them re-typeset, or something; and asked Martin to help. Martin's job was to look around the world and try and find somebody who could write a new introduction. Allan Bromley from Australia wrote an introduction to some of Babbage's things; I wrote an introduction to one of Napier's things; Martin and I together wrote introductions to a couple of things, one of which was the Moore's School Lectures, which described the ENIAC for the first time. And then also an introduction to some British computer conferences, when we reprinted those. But some of them have led to interesting little anecdotes, if I may.

Walden: Yes.

Williams: The one that was the Moore's School Lectures which was the first time that the ENIAC had been made public. There were a set of notes from those Moore's School

Lectures that had been published but they were only published several years after the lectures themselves. The lecturers, people like von Neumann, and Eckert, Mauchly, and Sharpless, and whatnot; were shown the draft of the notes and they didn't think of this as a historical situation, you know, the first time the ENIAC was made public, basically. They thought of this as a thing to describe the modern basis of computing and so they made changes to their talks, and they added material that they hadn't presented, all sorts of things; and there were some lectures that they hadn't recorded because they had been using an old wire recorder—magnetic wire recorder—because it was just after the war when this technology was first coming into the U.S and it kept breaking down. For that reason, Martin and I decided it would be good if we could find as many people as possible who were actually there, and ask them what they remember about these things. We were on some sort of tour together around the Eastern part of North America; and we were in Boston to talk to a few people. We had a list of all the attendees and we had figured out who had died, and who were still alive. We had been told there was some chap named Frank Verzuh. And so we talked to people about Frank and were told that he's a bit of a funny character, I don't think you'd get much from him, so we thought we wouldn't bother; but we had an afternoon to spare so we thought well, let's get a telephone book and see if we can contact Frank Verzuh, which we did, and he said 'yeah, come on up boys.' So we went up to his apartment and we're talking to him, and asking him how come you were there? And he said well, he came from a family in I think it was the Argentine, or who had business interests in the Argentine, and they had sent him to business school so he could take control of one of the companies. But he didn't like business, he wanted to be an engineer. He finally rebelled and went into engineering

instead, much to the displeasure of the family. But then he sort of wistfully said to us, 'you know, the stuff I learned in business school helped, you know, for example, it taught me how to type, how to do shorthand. In fact when I was there at a conference, I took shorthand notes of every single lecture.' And we said, 'really?' What happened to them?' 'They are in that closet right there, would you like them?' He said 'I've actually typed them up.'

Walden: So he transcribed them? Wow.

Williams: And he gave us the transcripts. [Laughs.] Other than that, we would've had no inclination of what happened for real, at those things; we'd have just had peoples' impressions, that's all. But here we were suddenly presented with this gift that to a historian was like gold.

Walden: Sure.

Williams: Another interesting part was that there was one we were doing; it was called a German volume, [*The Calculating Machines (Die Rechenmaschinen)*], and it was about calculating machines, done about 1920-something, I think. And people who collect calculating machines, old ones, think of this thing as a bible. It's got descriptions of each mechanical calculating kind of machine that was available at the time and this fellow, Ernst Martin, had done this as a venture to sell to businesses and things, so they could figure out what kind of calculating machine they could best use. The Babbage Reprint

had been started by a fellow in Britain and he had translated out of German into English. It was not a very good job, and so I was asked if I could take this over and see if I could make it a little more sense out of it. The German was difficult and I'm not surprised the resulting English was difficult, but it didn't make sense in certain places. In fact, a lot of it didn't really make sense. So Peggy Kidwell, from the Smithsonian, whom I had known since the days that I worked there, agreed to help me and she speaks a little German, which helped, and together we worked; you know, e-mailed back and forth about the different kinds of questions we had. Well, there were things that we could not translate or could not understand, and so we even went so far as to send the text out to people in the Deutsches Museum in Munich, who were experts in the field and whose native language was German. They eventually admitted that they didn't understand what was going on either. It was just very, very difficult; Ernst Martin had this way of expressing things, which to him, probably made perfect sense, but only to him. So there are no end of footnotes in there that say we think this is what he means, we're not sure. And, of course, we had to write an introduction about who was this Ernst Martin. We could find very few things; we couldn't find a date of birth or death, we couldn't find anything else; he was a mystery man. You'd think a man who was in business to do this would be known somehow, there'd be some records. Nobody knew anything; the people in the Deutsches Museum, nothing; they couldn't find any record of Ernst Martin anywhere. So we finally admitted in the introduction that he was a mystery man, we had absolutely no idea, and the book went to press as part of this reprint series. It must have been two years later that I got a letter from somebody in the Netherlands, saying that he had just seen our work, and it's not surprising that you couldn't find anything about Ernst Martin because he

didn't exist. His name was actually Joachim Muller, something like that, and he used Ernst Martin as a pseudonym. [Laughs.] This fellow seemed to know about him; how, I'm not sure; at least I can't remember at this moment; but that's the sort of interesting little problems you come by. He had also published a similar work on typewriters, and that after the war was over, the second war, he attempted to publish an updated version of this calculating machine book, and was denied permission by the authorities who controlled all publishing in Germany at the time. After that, he just vanished.

Walden: That's so interesting. Well, we could go on a very long time because you've gotten a lot of awards, you've done so many other bits of professional society work, and you've published both refereed and unrefereed things; you've participated in just so many things in the field of computing, and especially computing history research.
What I will do is find a way to just deposit the hard copies of everything that I found as part of preparing in a place which we can point to from where the reviewed transcript is published; not making it public, necessarily, but telling a future historian there is a cache of additional material.

Williams: Okay. One other thing that I might mention, something that won't be in there because it's just recently completed, about three years ago, now; four years ago; no, five years ago; I got a missive from a chap that I know quite well, who is on the ACM History Committee; and the ACM History Committee had decided that it was time to get a new version of the Turing Award websites with more up-to-date information about the Turing Award winners. Now, for some of them, there was a page of information there; others

there was just, you know, 'Joe Blog won in 1970-something' and that was all; not why he won it, nothing about himself, nothing like that. So it varied from reasonable stuff to just completely ridiculous, and would I be willing to take part in this. I said no, I still have stuff to do with the Computer Society and I don't want to bite off more than I can chew. They said oh, we understand and it was a couple of years later that I got this phone call again from this same fellow who said I know we asked you once and you said no. But, he said, you're not quite so busy anymore and we just got approval from the ACM to do this, and we've got approval to pay the writers, but what we need is somebody to sort of oversee this thing and make sure that it's all done properly. Would you be the overseer? And so I finally said yes; and now, if you look on the ACM site for the Turing Award winners you'll find that every person has a large write-up. A few were done by me because I couldn't find anybody else who would write it so I just did it myself. Others were done by professional writers; others were done by former colleagues, etcetera. Did you do one?

Walden: I did the one on Knuth.

Williams: I thought so; I was trying to remember. And that is now finished, and I'm out of it. They have already selected a new overseer to keep it going. I understand that Tom Haigh has agreed to do the oversight stuff; and now, of course, you only have to keep it up-to-date every year, it's no big job. When you have to do 70 or 80 it's a much larger effort; but it looks good, and I'm quite proud of the fact that I was there to at least guide it along and then find people like yourself to move it along.

Walden: Having had decades of making connections, it pays off.

Williams: And finding willing volunteers like yourself.

Walden: So, if you will: we've talked mostly about your professional career except at the very beginning where we talked about your youth a bit, and your brother and your sister, and so on; can you say a bit about the rest of your life? You mentioned when you first got here, you've got a woodworking hobby.

Williams: Yes. My wife Michelle and I, had a son, and she was very ill with that son; and if we wanted any more children we had to adopt. We adopted a baby girl a couple years after, and they are now both in their forties with children of their own, of course. We don't have a great deal of contact with the girl because she doesn't have a telephone, so it has to be done by mail and that's a bit tough. But there's usually a phone call from our son every week. Neither one lives in Calgary; son lives in Edmonton and the daughter lives in Vancouver Island, so she's a little more difficult for us to get to. But the son's in-laws live in a city called Lethbridge, south of Calgary, so they're very often passing through on their way to visit her parents, so they stop off and often stay with us for a night. I quite enjoy those occasions. When I retired I was concerned that I would not have enough to do, so I had always been interested in woodworking and I actually had started to build a collection of woodworking machinery, you know, table saws, band saws, and planers, and joiners, and things like that, plus the usual hand tools; and had made

furniture; tables and chairs, and boxes, and things like blanket chests and whatnot. And the university used to — I don't think they do anymore — but they used to provide a retirement gift and they said what did I want as a retirement gift? I said it would be nice to have a lathe. They said well, we're not sure that we can fund that entirely, but we'll give you the money and you can spend whatever else you need. So they did, and I bought a lathe. The only problem is I had absolutely no idea how to use it. I tried to use it a couple of times and discovered I didn't know [how to use it]. I thought great, now I'm going to have to wait until I have enough time to take some proper lessons. A few years later, it must have been 10 years later, I guess; I had bought a woodworking magazine in the grocery store, and as I was checking out the man who was running the till looked at this and said, 'do you do any woodturning?' I told him I have a lathe but I don't know how to use it. And he said, 'I belong to the Calgary Woodturners Guild and we meet once a month on Tuesday nights; and next Tuesday is when we meet at such and such a place; come along and we'll teach you how.' I thought nothing ventured, nothing gained, so I showed up and I've been showing up ever since. They have practical sessions as well as talks, and I'm now doing some teaching myself in their practical sessions, teaching newbies how to do it. When I finally left the university last December and closed my office, I thought that a lot of support staff have given me a lot of help over the years; they've been a real blessing to me. I asked the chief administrative person of the department if there would be any objection if I gave them each a present? She said 'no, many people leave us a box of chocolates or something.' I said I was thinking more of a turned bowl for each of them. She said 'there's a lot of them, you know.' I started making turned bowls well in advance, and it often took me, oh, about 2-1/2 or three hours to turn

a bowl and then get it down to the point where it had a nice finish on it. And by the time I had done 27 of them, it took me 45 minutes to finish a bowl. [Laughs.] But the day before I actually turned back in my keys, I went around to each of them and gave them a bowl, done in highly figured maple. There were big ones, there were small ones, there were platters; there was all sorts of different things and let them choose whichever one they wanted. I just systematically went around the whole office and technical staff making sure each one got a bowel, They seemed to very much enjoy that.

Walden: Wonderful. Okay, well thank you very much, Mike. You've had -- you're having -- a fascinating life and I've really enjoyed hearing about it. As I said at the beginning, we'll have a transcript done; I'll pass it to you for review after I've first taken out the obvious errors. So thank you very much for coming and that's the end of the interview.

Williams: Thank you, Dave, it's been a pleasure.