John R. White Interview

Oral History

Conducted by Arthur L. Norberg

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Abstract

For convenience, the John R. White interview is divided into eight parts, reflecting the major parts of his professional life. Constructed to contain largely independent topics, at times a subject comes up in two or more divisions, where it contributes added information in a new setting each time. White begins his interview with an accounting of his early life and the circumstances that led to his family's moving from his birthplace Kansas City, MO, to Los Angeles, CA, where he was educated in elementary school and high school. White describes how he chose UC Santa Barbara for his undergraduate education, and who and what influenced his joining the ranks of computer people in a field just beginning its first expansion. Describing his undergraduate training in EE and CS, he describes a set of serendipitous events that confirmed his choice to do graduate work in computer science at UC Santa Barbara. He became interested in programming and systems and software. The main thrust in his doctoral work was to build a compiler writing system the right way, that is, in terms of the semantic and syntactic sides, specifying what a language is. While the syntactic side was rather well known at that time, the semantic side was a bit more haphazard. After completing his Ph.D. program, he joined the faculty at the University of Connecticut. There he published, alone and with colleagues, well-thought out papers on linkers and loaders, a tool for enforcing system structure, and an engineering approach to software design.

In 1981, White moved to Palo Alto, CA, on a sabbatical, but did not return to University of Connecticut. Instead, he obtained a position at the Xerox Palo Alto Research Center (PARC). He participated in the heady atmosphere of the center. He describes the management structure and accomplishments of the center and his many roles in this structure. He adds much information about the inner workings of the center.

White details his involvement with and contributions to ACM both in specific instances and as an overview of ACM's change from old practices in managing program and funding areas to a range of new practices that emphasized the new age of computer science of the 1990s and later of the 2000s. The ACM Digital Library is a good example of the association's approach to the new era. But other topics span both periods, such as the place of SIGs in the governing and funding of the ACM. His involvement in ACM activities illustrate the excellent management skills he honed at Xerox PARC. White served on the Council in many capacities: Regional Representative, Board chair, Advisor, Member, Vice President, President, and Past President. White's service and his work with other volunteers enhanced ACM's structure, initiatives, and standing with members. He describes his interactions with many volunteers and ACM headquarters staff.

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ACM Fellows Program, VIII
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Part I: Early Life and Education

June 1, 2009, Session 1, Tape 1, Side A

NORBERG: I am in the office of Dr. John R. White, past president of the Association of Computing Machinery (1990-1992), and now the CEO of the Association.

Can we start with some general information about your upbringing, your education, and your degrees? You were born where?

WHITE: I was born in Kansas City, Missouri, but my family moved around a bit. My father was an office manager for Brunswick Corporation, and he was assigned to different offices during his career.

NORBERG: The sporting goods company?

WHITE: Sporting goods, bowling alleys, billiard tables, long-playing records in days gone by, beautiful bars in the 1880s. We moved to San Francisco when I was nine months old, and then to the Los Angeles area when I was just starting 2nd grade ... and that's where I was raised and went to high school.

NORBERG: Other siblings?

WHITE: No, only child.

NORBERG: What did your mother do during this period?

WHITE: My mother was a stay at home mom until I was in about the 6th grade, and then she went back to work. Went, I think, not so much for the income but to have something to do and build a network of relationships.

My father went to a year of college at the University of Iowa, but then the Depression hit. He landed a job with Brunswick right as the Depression was beginning and managed to stay employed throughout the Depression. As a result, he always had a soft spot for Brunswick. Eventually he completed a law degree through evening law classes. Although he passed the Missouri State Bar, he never practiced law.

Education was taken seriously in my family, and in a way, I was the first to go to, and complete, college. Should I talk a little bit about my education?

NORBERG: Yes, I wish you would. What sort of an elementary school did you go to? What was the high school like?

WHITE: I went to a classic 1950s elementary school in Alhambra, California ... Garfield. It was a K-8 school. I arrived in 2nd grade and left at the end of the 8th grade. Probably the biggest

thing that happened in those days was the launch of Sputnik and the beginning of an year of real excitement around math and science.

I went to a big high school. I think there were two thousand students at Alhambra High. It was a great school, having all of the dimensions of math and science that you would expect. Somewhere along the way I transitioned from being a fairly average student to being a pretty good student. In the second semester of my freshman year, I realized that if I studied and actually did the homework, I would get good grades. This pleased my parents a lot. And so I thought, this is not all that hard, why don't we just keep doing it? Throughout high school, I found that what I really enjoyed were math and science classes.

NORBERG: Which were?

WHITE: For science it was chemistry and physics. I never took biology in high school.

NORBERG: How about mathematics?

WHITE: For mathematics, it was the classic sequence of that era: freshmen year was algebra, second year was geometry, third year was advanced algebra, and then fourth year was trig and pre-calculus. Chemistry and physics had a lot of math in it, and I thought they were quite fun. While I did well in those courses, I tended to dread English and foreign languages. But high school was great overall.

Thinking back on it, if you were interested in math and science you were sort of in classes with the same group of kids ... with everybody reasonably serious and doing well. Many of us made the scholarship society each semester, which earned you a day off to go to the beach. After a certain number of semesters making the scholarship society, you became a life member of the California Scholarship Federation.

As a group, most of us were heading for the University of California, and you could place out of foreign language at the university level if you had four years of foreign language at the high school level. We had all started off in German because it was the Sputnik era, and after the third year we convinced Alhambra High to offer a fourth year of German so we could all skip studying any more German in college.

My parents wanted me to go to a university. It was affordable to go to The University of California; it was just a question of which campus. We were living in the Los Angeles area, so UCLA was a little too close. UC Berkeley was a little too liberal for my parent's Republican point of view. UC Santa Barbara was about 100 miles away, making it a good university at a good distance from home and, thus, a perfect fit. It's the only college I applied to.

Regarding my major, I remember a conversation with my parents about what I was going to study when I got to the university. I said I didn't really know. I had been looking at some classic government books on occupations and the education required for each, and I said, "Maybe I should look at being a doctor," but I didn't really know what I wanted to study. And they said, "Well, I don't know whether you have noticed, but you're really good in mathematics. Why don't you major in math?" And I said, "Oh, okay."

So after high school I left for the University of California at Santa Barbara. In those days, you picked your major when you walked in the door, so I was a math major from the get-go. It fit me quite well for several years because I really enjoyed it and found it pretty easy. I remember being in Calculus classes - maybe 500 students – and getting the top grade or the second highest grade in the class. Studying mathematics and doing the assignments was something I looked forward to, versus trying to figure out how to do my philosophy projects or anthropology term papers. In those days, like a lot of people in math and science and engineering everyone took Physics IA-B-C.

NORBERG: Was it on the quarter system then?

WHITE: No, it was on the semester system in those days.

Similar to high school, science and math students met each other in the same classes all the time and logically began to hang out together. These people were in your calculus classes, and in your physics classes. Some of them were physics majors, some of them were EE majors, and some of them were math majors like me. I began to realize that the physics was getting really hard. I hadn't taken any electrical engineering; I didn't plan on it. So I just sort of stayed with mathematics.

NORBERG: Why was the physics so difficult?

WHITE: Oh, it just seemed like the problems were getting harder and harder to solve. The guys I knew in physics and the guys I knew in electrical engineering seemed to need to work harder than I did, and I was working about as hard as I wanted at that point.

NORBERG: What year did you start at Santa Barbara?

WHITE: I started there in the fall of '63, at which point The University of California, Santa Barbara was, I think, about the same size as my high school. I worked my way through a standard set of undergraduate math topics. As I moved into more advanced mathematics, it was becoming little less interesting. About my junior year I began to wonder what my path through these courses was. I was done taking physics, and I hadn't signed up for any chemistry or any other real science work. I was taking a lot of math discovering that the math is getting harder and less relevant. At least with calculus you use it in physics class, and it all kind of made some sense.

Three things were in play at the beginning of my senior year. One was the question of what am I going to do after I graduate from UC Santa Barbara with a degree in math? What do I really think about mathematics? At this point, I was thinking of going to graduate school, because I was always kind of an achiever. I remember as far back as high school reading the University of California catalog requirements: for a Bachelor's degree, for a Master's degree, and for a PhD degree. I said, oh, well, they offer all three of these; I should probably do all three.

These were the years of the Vietnam War, which was significant. I went through undergraduate school on a student deferment. I ended up going to graduate school the first year the

Government stopped offering graduate student deferments, but staying in school was another way of avoiding the army. So two issues I thought about pretty regularly were: What am I going to do with math? Do I want to go to graduate school?

As these thoughts were percolating, I was taking a course in real analysis, and thus, getting into the deep underpinnings of what I had learned in calculus. But this course is much more significant and much harder, and I'm not doing quite as well—I'm not quite as interested. I was also thinking about graduate work in mathematics. Let's see, I was struggling to get my head around mathematics that was developed in the 17th century, and I'm supposed to do original research. I have like 300 years of mathematics to get under my belt before I can do anything that hasn't been done before. This seemed a bit overwhelming.

The third thing that happened in my senior year was probably the most significant of all. I would walk by the university computer center on a regular basis, and all of a sudden I see in there, a big new IBM 360 model 50 and a guy my age who had been in a bunch of my math and physics classes. So I went in and asked him what he was doing. He told me he was working for a professor who at that point was in the math department. The professor's name was Glen Culler. He was running a really rather amazing Advanced Research Projects Agency (ARPA) funded research project at UC Santa Barbara. Glen was part of a very small community of principal investigators, academics at universities, who were getting major funding from ARPA. This funding began with the first IPTO Director J. C. R. Licklider, and continued later under Bob Taylor. All of a sudden, here I was at a relatively unknown university when it comes to computing, yet, here is a professor who has one of the 13 (12, 11, I forget the number) major ARPA research grants in computing. There was MIT doing timesharing, and the University of Illinois, UCLA, and Carnegie Mellon all doing parts of the IPTO program, and here was UC Santa Barbara on the same map because of Glen Culler.

Glen had a couple of research projects. One was collaboration with a physics professor at UCLA, Bert Fried, putting together a mathematically oriented timesharing system. The Culler-Fried system allowed one to manipulate mathematical formulas and look at the results on a CRT storage scope that could plot functions. Culler put together an experimental version of this system and used it for doing applied mathematics, both for education purposes and for solving real problems. ARPA wanted Culler to move the system off of a very unique, experimental Air Force computer onto a commercial mainframe. The fellow I had run into, Charles Irby, was a senior math major like me who had gotten a job programming for Glen on this research project. I said, "Wow, that's interesting. He said, "Well you should go talk to Glen."

My math advisor knew Glen Culler and told me Glen was transitioning then from the math department to the newly formed School of Engineering. UC Santa Barbara created an EE department out of thin air by recruiting established faculty from Yale. The head of this new EE department realized Glen was just a brilliant mind in computing, and that computing was the future. The math department had a very archaic view of the early days of computing—they just didn't want anything to do with it. So Glen was given a whole floor in the new engineering building for his offices, his students, and his computers.

Right before Christmas vacation of my senior year I met with Glen. I explained who I was, how I found out about him, who my friend Charles Irby was. I'll never forget, Glen says, "Well do

you know anything about computing?” I said, “I don’t know a thing about computing.” He says, “Perfect, you’re just the kind of person we want.” And he said, “Here, take this and read it over the Christmas holidays.” He gave me a copy of The Principals of Operation for the IBM 360 model 50. I knew nothing about computing. I knew nothing about machine organization. After a few pages I realized computers used a binary number system. That there is a machine-level instruction called “load register” – gee, I wondered what a register is, I wondered what load does, I wondered what memory is.

So ... in the last semester of my senior year as a mathematics major, I now have a part time job learning how to program the IBM 360 and am part of the group re-implementing the Culler-Fried timesharing on the university’s mainframe. It was fun ... and I was making money!

Part II: Graduate Studies

Midway through this last semester, I was trying to decide what to do. I had taken the Graduate Record Exam and did really well in math and was accepted into the PhD program in mathematics at UC Berkley UC. At this time I had no computer science on my resume, yet it was becoming increasingly clear to me I wanted to do graduate work in computer science. I remember applying to Stanford’s CS department, but with nothing to show for knowing anything about computing, didn’t get in. The EE program at UCSB really wanted to nurture a graduate program in computer science based upon Glen’s work. I decided not to go to Berkley in math and to move from the Math department at UC Santa Barbara to the EE department to pursue a graduate degree in computer science. The computer science program in the EE Department was kind of cobbled together, because there were only a couple of professors doing real computing.

I completed my undergraduate degree in mathematics and moved to the EE department to pursue an MS degree in computer science..

NORBERG: Did you need to do any sort of thesis at the end of your master’s degree or was it just coursework?

WHITE: No. A Master’s Degree was course work and an oral exam. I started the fall after I finished my undergraduate degree. Again, I was working half time as part of the group trying to get this time sharing system to work. I was taking a handful of courses that were being offered. The EE department was then systematically adding a new faculty member in computer science each year. Eventually, the department assembled a reasonable group.

NORBERG: Who else was there?

WHITE: Glen Culler, of course. The other core members of the department in those days were two other UCLA grads: Rodger Wood and Jim Howard. Roger taught a variety of courses. Jim was focused on computer architecture and digital systems. He taught the Switching Theory course and the Advanced Architecture course. Rodger Wood seemed to know something about every aspect of computing and was more than willing to serve on committees and be part of exam groups.

About a year into my Masters degree, Leon Presser joined the program from UCLA. He was probably the first “real” computer scientist hired by the department. Leon became my advisor eventually. Leon came out of the computer science program at UCLA, not out of the EE department. He started teaching courses in compilers and ran graduate seminars where we’d all get together and do operating systems by reading papers and analyzing things. It was great, because here I was studying computer science at a school that was actually on the map from a national point of view. I was making \$3.50 an hour writing programs, which made me the richest graduate student I knew. I think I probably had more discretionary money to spend when I was a graduate student than I’ve ever had since.

NORBERG: You didn’t have to pay any tuition did you?

WHITE: Well, in my undergraduate days, no. When I went to the University of California my freshman year, there was no tuition, there were fees of \$79 for the semester. By the time I went to graduate school, I was sort of turned into a research assistant on Glen’s grant, and doing my work on the ARPA project as a research assistant. I finished my master’s after four quarters, and then I took a year off. I just worked fulltime on Glen’s ARPA grant, although I took some classes. When Leon Presser arrived, I jumped back into the program full time as a PhD student. Glen’s research moved on. He became interested in speech recognition, and received some ARPA funding to pursue that. This new direction for Glen was not up my alley of interest. I was more interested in programming and systems and software. Soon thereafter, Glen left the university to form a company in Santa Barbara to actually do major work on speech recognition. I ended up being much more aligned with the computing group wanting to do computer science. As I said, Leon Presser became my advisor, and later Rodger Wood and Jim Howard became the other members of my committee.

NORBERG: Who were some of the other students that you were interacting with?

WHITE: Well in the early days, I was doing my master’s degree at the same time Charles Irby (he’s the guy I’d seen in the computer room and who introduced me to Glen Culler) was doing his master’s. He finished that and went on to Stanford. Charles actually ended up working with Doug Englebart and then went to Xerox’s Office Systems Division in Palo Alto. He was one of the major program managers in Xerox’s development of the STAR system. STAR was the product version of the research system centered on the ALTO developed at Xerox PARC.

James White was at Santa Barbara at the time I was there as well. UC Santa Barbara ended up being the third node on the original ARPANET. Glen had come back from an ARPA Principal Investigators’ meeting, saying, “Hey, we’re going to implement something called the ARPANET.” Everybody went, “Oh really? What’s that?” James White ended up doing all the programming to implement the Host-IMP interface for the UCSB system and brought us onto the ARPANET. James went on to work at Xerox’s Office Systems Division as well and was one of the architects of Xerox Network Systems (XNS - the product version of the research networking prototypes).

Also at Santa Barbara at that time was Jim McGill, who eventually completed a PhD in Physics and is now responsible for the IT infrastructure for Morgan Stanley in Asia. Also there was David Retz, who has stayed in the Santa Barbara area and done various companies. John

Greaves was coming out on the EE side of the department and worked very closely with Glen. John did a research project for his PhD called the Bug Watcher. This project was collaboration with a professor in biology to build a computer system to track and analyze the movement of microbes. After his PhD, John was a professor at Southeastern Massachusetts University for several years. In the early 80's John returned to California and established a company based on the system he had built for his PhD. The company is called Motion Analysis Inc and is a major player in the animation industry. Motion Analysis exhibits each year at SIGGRAPH, ACM's major conference in graphics. There were quite a few fellow students at UC Santa Barbara who went on to do interesting things.

Glen Culler was amazing. He had great vision, great funding. He managed his graduate students like an extended family, and he changed my life. It was fabulous.

NORBERG: In what way?

WHITE: Not only did I have a chance to study computer science when I couldn't get into a graduate program because I knew nothing about computing, I had a chance to study it with him; I had a chance to work on research projects that were in the top ten or twelve highly valued research projects in the field. I attended ARPA graduate student meetings where I met a number of other PhD students in computer science from around the country ... all of whom went on to pretty amazing careers. Graduate students like Carl Hewitt, Austin Henderson, and Bill Paxton. So it was remarkable—a remarkable experience.

It's kind of interesting as today I serve on a small advisory board for the Computer Engineering program at UC Santa Barbara. One of the other members of this advisory board is a distinguished Computer Science professor from UC Berkley, David Culler, who is Glen's son, and that's kind of fun— since I knew him as a kid. In the same vane, Rodger Wood organized a staff baseball team every summer, and this little scruffy kid, David, always played with us. Later, when I was at Xerox PARC, we worked really hard to recruit David Wood when he finished his PhD at UC Berkley. Although David ended up going to the Computer Science Department at the University of Wisconsin, it was a fun experience to interview him for a job after knowing him as a young kid.

Santa Barbara was a really amazing place in those days.

NORBERG: Can you describe to me the elements of your PhD dissertation?

WHITE: Yes. I did what I think of as the last dissertation on automatic compiler writing systems. The main thrust in my doctoral work was to build a compiler writing system the right way in terms of the semantic side of specifying what a language is. A programming language has syntax ... that is, the grammar that defines the structure of statements in the language and semantics for specifying what those statements mean. The syntactic side was pretty well understood by 1970, when I started on my PhD. The semantic side, the code generation side, was a bit more haphazard, and so I made a run at trying to do that aspect of compiler writing in a very systematic way.

At the same time, there was a serious effort underway in software development and software engineering to focus on improving reliability. This movement, so to speak, was called structured programming and was concerned with the question: How do you build reliable systems? I got very interested in this issue as well. The language I implemented for writing compilers had a lot of structured programming concepts in it, and also incorporated some of these ideas in the way you generated code. That was focus of my PhD. Only one more interesting PhD study was done on compiler writing systems after that, and then the whole approach kind of changed.

NORBERG: In what way?

WHITE: The sophistication of attribute grammars and approaches for organizing the semantic code generation phase of compiling advanced, and it became, in my mind, more of a formal approach to quickly building interpreters for new languages. As this was going on, my research interests moved more into the area software engineering and reliable systems, and the question of how to manage large software projects. What aspects of the language can assist? Sort of computer aided software engineering was what I was focused on in the mid '70s.

When I finished my PhD, I pretty much committed to joining academia. It seemed like the right fit for me. I was a professor for about nine years, and the research program I built up, and the NSF funding I obtained, was all centered on software engineering.

Part III: Research and Publications

NORBERG: Now, this was done at the University of Connecticut? The nine years we're talking about.

WHITE: Yes. I went to an EECS department, again, because a fellow graduate student at UC Santa Barbara had gone there a couple of years before I finished my PhD. Bernie Carey was the individual and he managed to convince both me and the EECS department to have an interview. I was offered a position and joined the EECS department in the College of Engineering ... a pretty good fit given where I was coming from. But I was the first person to join the program that didn't have a degree in EE; I had a degree in Computer Science.

NORBERG: Was this Taylor Booth that you were with there?

WHITE: Yes. Taylor Booth was the head of the program. Taylor Booth had, by this point in time, established a great reputation. He'd written a fundamental textbook on advanced digital systems as well as a more introductory textbook. I'd used his textbook my last quarter at Santa Barbara ... where while trying to finish the writing of my dissertation, I was asked to teach two courses ... courses I'd never taught before. I taught the introductory course for computer architecture and machine organization where we used Taylor's book, and I taught the compiler course where we didn't really use a text book ... but we did use my compiler writing system. This was a really crazy quarter for me. I was just finishing the implementation of the compiler writing system when suddenly I had 25 students that were going to use it to write compilers for real programming languages. In that final quarter I wrote the final version of my dissertation, the

user manual for my compiler writing system, and taught two courses I had never taught before. I somehow survived.

The good thing is when I went to the University of Connecticut; I brought everything with me. I was asked to teach a compiler course at UConn, and with all the work I had done at Santa Barbara, it was pretty straightforward.

Taylor Booth was the head of the Computer Science Division of the EECS Department; he was great. He was a real mentor in both setting high standards for what you needed to do in order to be a professor, and then when he could, helping you see how to do it.

NORBERG: I've read these papers, but I can't say that I really understood all of it since my background in computing is relatively small. Anyway, this is something that you must have done with Professor Presser before you went to The University of Connecticut.

WHITE: Ah yes, "Linkers and Loaders." This paper is the first article I ever published. As I said earlier, our graduate program in Computer Science, since there were so few students and so few professors, offered mostly seminars. We did a seminar one semester on operating systems. There were about six of us in the class, and each of us took a major part of OS 360 and understood it in detail. I ended up looking at the linkage editor, and wrote a term paper on how linking and loading works inside OS 360. Leon Presser read it, and said we should turn this into a tutorial for ACM's new *Computing Surveys* that had just started about 1969. I think I did this paper sometime around 1970 as a class project, and then we worked on it for a semester, enhancing and adding things. If you read the paper, the examples are all drawn for the 360 because that's what I had done the project on. We submitted it to *Computing Surveys*, which had a huge circulation then—it was really becoming a popular magazine—and much to my surprise and certainly pleasure, it was accepted and published before I graduated with my PhD. So when I went out on the interview circuit, at least I had a publication that most people knew and had seen.

NORBERG: Why did this paper have such influence on the community?

WHITE: I think it was not so much it had influence; it just went into a core part of operating systems, and explained it in a very fundamental way.. A lot of students knew bits and pieces of this area, but nobody had sort of laid out linking and loading as a fundamental operating system component, and that's what we did.

NORBERG: There aren't many references in this paper.

WHITE: No, the references are mostly to IBM System 360 manuals I think.

NORBERG: Okay, there is another paper – "A Tool for Enforcing System Structure" – and I would like to talk about it and another paper a bit because I'm interested in knowing what the relation is among these papers, and what the contributions of your colleagues might have been.

WHITE: Sure. "A Tool for Enforcing System Structure" was actually published at an ACM annual meeting, I believe. And as I indicated, when I put the programming language together to

write compilers, I was influenced a lot by what was going on in structured programming and building reliable systems. There were aspects to the language that were developed to try to be more systematic in having good structure within a complicated program. These language features were the focus of this paper, and that's why it's called "A Tool for Enforcing System Structure". I don't think this had much impact on anybody, but it was at least a record of some of the good ideas that came out of our work.

But this other paper, this third one, "Towards an Engineering Approach to Software Design", this was, I think, one of the areas that I was really most pleased with in my research at the University of Connecticut, and my work with Taylor Booth. Taylor was a hardcore EE computing guy, who was much better at mathematics than I was ... certainly when it came to probabilistic systems analysis. I was much better at systems and structure and software. We would talk about software engineering. I was focused on software engineering as the process by which you manage complexity, because you're building complicated systems, and the way you formulate abstractions, the way you implement those abstractions, the way you think about decomposing a problem into sub-problems ... all the stuff that is the essence of good software engineering.

Taylor would talk to me about, "Well, you know, there's some real engineering analysis that ought to be going on when you build systems." And we would go back and forth on that subject. He would say, "You need to understand ... you need to have a model of what your input space looks like. You need to approach this as a sort of systems exercise in more of an EE sense." As we tried to reconcile these two somewhat different priorities in looking at building robust systems, we found that where they came together centered on one of the questions I was focused on—How do you formulate abstractions? How do you use what was then the new notion of data abstraction as a way of decomposing a system into modules? Taylor said, "Well, the choices you make in terms of which modules you use, that's where you need to do some real analysis." And it all kind of came together in this paper, which was using modeling and probabilistic models to make choices from alternative decompositions of things that you have to implement. The examples in the paper are straight forward and simple in implementing linked lists and so on. But in the end, the most efficient implementation really ended up being a function of what the input is, and if you can model your input world, then you can do some analysis to back up design decisions that might otherwise be considered arbitrary.

NORBERG: Can we go back for a minute to your arriving at U Conn? What did the administration, either of the college or the department, offer as their goals for this program? Did they hire quite a number of computer scientists? Did they hire electrical engineers who were interested in architecture, say? And how did this group interact together?

WHITE: The College of Engineering had established the EECS department at some point in the not too distant past before I arrived there. But what was pretty clear is that there were really two divisions. There was a Computer Science division, and there was an EE division. The main hiring that was being done when I applied was in computer science ... to help build up that program. I was the first non-EE to be hired into the CS division of the EECS department, and I don't think we hired any more EEs into that program after that. I recruited one of my colleagues from UC Santa Barbara – Ed Balkovich – a great operating systems guy. We hired a fellow in artificial intelligence from Yale. We hired a programming languages guy from UCLA. We

hired another AI person from MIT, I think. We did hire one more hardware person. That was the growth that was going on.

Despite being a single EECS department, there was a division between the electrical engineering side of the department and the computer science side. There was a reasonable amount of congeniality, but there was a division as well. I can remember interviewing with the dean, and he expressed concerns over whether computing was really going to stick. He was concerned that computing would become the aeronautical engineering of the late '70s and early '80s, and that computing would just get swallowed up by EE or another area ... because it's not really engineering.

What we were doing under Taylor's mentorship and leadership was building a pretty strong computer science program inside the EECS department. All of a sudden there was a bunch of us that had just finished our PhDs. We started nailing down NSF grants, so we had a lot of research funding. We had competition over graduate students. We were working our way into the second tier of research programs. It was an exciting time. There was collaboration going on between groups, and we were getting ourselves established on the map. The next logical step for the computer science program was to consider being a separate department of computer science and engineering, let's say, inside the school of engineering, but breaking off from EE. And we, the computer science group, spent about a semester thinking this through ... putting together a formal proposal to the dean. The decision that came down from the dean was very bad ... there should be no separate program in computer science. Moreover, he didn't want anything thing done that would promote the notion, the concept, the identity of a separate computer science program. It was a decision that ended up destroying the computer science program we had built.

NORBERG: Same dean who had made the objection before?

WHITE: Right. No separate program in computing, and in fact, anything that the Computer Science Division was doing to really promote a separate and distinct image for computing science at UConn was a bad thing. This happened right as I was leaving to go on sabbatical, which I did. I was married at the time. My wife got an internship in Palo Alto in clinical psychology at the VA hospital, and I went out to Palo Alto and never came back. No one else came back either. My best friend, who I had recruited from UC Santa Barbara in operating systems left and went to DEC Research. The fellow that had recruited me left and went to GE research. It didn't happen overnight, but the program that was growing and expanding with a lot of young faculty, with a lot of research grants, working it's way solidly into tier two of the research universities, was pretty much blown up by the dean's decision and going beyond what he really needed to decide ... and I think it broke Taylor Booth's heart.

NORBERG: Did he leave?

WHITE: No, but this was happening about '81 or '82. I went on to Xerox PARC and would interact with Taylor regularly with ACM and IEEE stuff. He tried to keep things together at UConn but in the end, Taylor suffered a massive heart attack and died in 1986. It was really sad. The program had to regroup over the years and decide what they wanted it to be.

NORBERG: Where was the research grant money coming from?

WHITE: For me, it was from the National Science Foundation. I had three or four grants from them. In this emerging computer science group, I think there was one ARPA grant, I think there were a couple of grants from Digital Equipment, because Storrs was pretty close to Maynard, Massachusetts, where DEC Research was headquartered, and there were some collaborations with them. One of Taylor's former students was a professor at U Mass but moved on to Digital as Senior Engineer. So there were quite a few collaborations with DEC Research, along with some grants from them. For me, though, the funding source was the National Science Foundation.

Part IV: Xerox PARC

NORBERG: Okay. It may seem crass to make the next statement, but I hope you won't be offended by it. Did you go to Palo Alto, or northern California if you like, because your wife got this internship in medicine? Was there any joint decision about this? When you went to Connecticut, did she follow you there?

WHITE: Yes. Barbara agreed to follow me wherever I got a job after my PhD. She was teaching science in a middle school in Santa Barbara. When I started at the University of Connecticut, we were a young married couple with no children. Barbara decided to continue teaching and found a job teaching science in high school in eastern Connecticut. A few years later our first child was born. Barbara took a year off from teaching high school, but at the end of that period, she really didn't want to go back to high school teaching. She was interested in clinical psychology. The good news was that there was a fabulous program at The University of Connecticut. The bad news was it was one of the top five programs in clinical psych in the country ... which meant they received 600 applications each year and accepted 10. Despite the odds, over the next two years Barbara did research, worked with some professors, and about the time that I received tenure, she started graduate school working on a PhD in clinical psychology, right as we had our second child. It was a pretty crazy period.

Session 1, Tape 1, Side B

WHITE: As Barbara entered the PhD program in Clinical Psychology, I took on the Chairmanship of the Computer Science Division of the EECS Department. I put off my sabbatical for a few years so it would synch up with Barbara's third-year clinical internship. She was interested in, and interviewed at, several facilities, but we were particularly interested in returning to California for a year. She was offered an internship at the VA Hospital in Palo Alto California. I said I'd use my sabbatical and go wherever she wanted to go. My goal was to spend time working on my grant, keeping up with some graduate students, and doing my stint of taking care of little kids. I never went to Palo Alto with the intention of leaving UConn. Everything related to computer science and UConn kind of fell apart while I was on sabbatical.

NORBERG: In a year's time? Wow, that was quick.

WHITE: Yes, and then it's February of my sabbatical year, and I asked myself: what am I going to do? All I had ever done was be a computer science professor. While I was proud of the teaching and research I had done and the grants I had, I didn't see how I was going to be invited to join the faculty at Berkley or Stanford. Luckily, there was an opening at Xerox PARC. Getting the job there is a whole other story ... one that goes back to Glen Culler.

NORBERG: Okay, we can embark on that then if you like. Having done some study of Xerox PARC, I'm interested to know what you found when you arrived there as a new recruit, shall we call it.

WHITE: I interviewed in the spring of 1982. Xerox PARC was 12 years old at that point, and had already established its reputation. I found two things at Xerox PARC. One, something called the Computer Science Lab run by Bob Taylor was doing just amazing research and building incredible advanced networked, personal computing systems. CSL had done amazing in the 1970's, and they were continuing to do amazing things in the 1980's.

My path into Xerox PARC wasn't through the Computer Science Lab. Xerox had just created a new lab at PARC called the Integrated Circuits Lab. One of the great things about the research in the Computer Science Lab at Xerox PARC was that it was all grounded in systems ... you really took a systems approach to everything. What PARC and Xerox wanted to do with the Integrated Circuits Lab (ICL) was to give these great researchers who were really good in systems... researchers who could move the hardware-software boundary depending on what their thinking was ... a capability to put that boundary in silicon and, as a result, to have just an incredibly tight coupling between systems research in CSL and the ability to build custom integrated circuits to support those systems. I knew nothing about integrated circuits. I had managed to get my PhD in Computer Science in an EE department that didn't make you learn EE. So interviewing for a job in an Integrated Circuits Lab was kind of strange. But what the new ICL wanted was a systems approach to all of the things they had to get done in that new lab: everything from controlling the fabrication process, to analyzing test data ... everything.

NORBERG: There was an interest in fabrication in DARPA at the time. Did Xerox PARC have any money from them for this?

WHITE: We didn't have DARPA money, but there was certainly close collaboration. The names that I remember in the early days of VLSI design were Conway and Mead. Lynn Conway was at PARC. Carver Mead was still at Caltech.

So ... I happened to see an ad for an opening at Xerox PARC ... in *Communications of the ACM* of all places, and I applied for it, not knowing quite what it was. PARC called me for an interview. I went for the first interview, and I met one of the engineers in this new Integrated Circuits Lab ... an engineer who was trying to build systems to help manage everything in the ICL. He learned that I was interested in software and systems and software engineering. But he also learned that I knew, and had worked with, several people that were working on STAR – the the product version of the Alto research distributed system built at PARC. The STAR system had been designed and built by people in the Xerox Office Systems Division. People like Charles Irby (remember back to my walking by the computer center?) and Jim White

Two things happened. I came back for a second interview, and began to run into people I had known as a professor. People like Jim Horning, who had come to PARC as a senior member of Bob Taylor's lab from the University of Toronto, and others. They all had the same question: "What are you doing here?" I said, "Well I'm interviewing for a systems position in the Integrated Circuits Lab." They go, "Really? That's cool."

My interview at PARC basically turned on a dime when it was discovered that I had worked with Glen Culler, that I was one of Glen's graduate student's, that I had built systems with Irby and all these people. Two things now happened. First, I had a new round of interviews with the Xerox Office Systems Division. Did I want to be a part of the group finishing STAR and taking it to the next place?

Second, Bob Taylor, who had run the ARPA office that funded Glen when I was a grad student, was running the Computer Science Lab, and he says, "Ah, we want a systems person in this new ICL," and here's somebody who comes out of the systems community that is at the heart and soul of a lot of what we do at Xerox PARC. All of a sudden I went from not knowing if I was going to the next interview step, to Bob Taylor, Manager of the Computer Science Lab, and Bill Spencer, Manager of the new Integrated Circuits Lab, both taking me out to dinner to kind of close this deal. I actually got an offer that was to either join as a senior member of the research staff in the Integrated Circuits Lab, or as a senior developer in the Office Systems Division. In the end, I decided I wanted to be at PARC, but it was really all closely connected.

I started work in the Integrated Circuits Lab and inherited a small group that was responsible for the distributed systems that ran the fabrication equipment and analyzed all the test data. The University of Connecticut had fallen apart in the middle of that academic year, and all of a sudden I found myself in computer science heaven. I considered myself very lucky.

Something very special for me was the fact that since I came from the ARPA community of the late '60s and early '70s, I was extended an invitation to be a regular part of the Computer Science Lab's weekly seminars and retreats. Bob Taylor who ran CSL liked the people that had worked for Glen Culler. When I said earlier I owe Glen a debt, it was getting me into computing, and then having it come back again and again to help me take the step ... from the academic world into what ended up being a great place to work, Xerox PARC.

NORBERG: What were the problems like that you were investigating?

WHITE: I wasn't really doing research per se. The Integrated Circuits Lab had a production responsibility to fabricate integrated circuits, and they had a research responsibility to push the processes the fabrication facility could effectively carry out. In 1982 when I arrived, the standard integrated circuit technology was four micron NMOS. The lab's goal was to be able to craft a reliable process that would do one micron CMOS. So there were some pretty serious research problems in process engineering.

What my group was doing was building the system that would manage the ICL's fabrication equipment and the processes being run... and let engineers tweak processes, collect data, and analyze whether the tweaks to the process were yielding the right fab, and later on, the actual

right chips. Of course, we were expected to do this using the computers that were part of the research facility at Xerox PARC.

NORBERG: And what were they?

WHITE: At that time, there were Altos, the original personal computer running the first versions of the Ethernet with file servers and print servers – and second-generation research machines based on the Alto.

What my group did was build a distributed database system to manage the fab process, and we built it off of the research mail system, if you can believe that. The research mail system, which was called Laurel, was very good at managing distributed email databases. A fab process is a set of steps. It's like following a recipe: turn this on, let this much chemical in, do this, do that, do that. So these are like mail files, and when you were doing these steps, it was like reading through an inbox but with a bunch of constraints put around it. We put this distributed system together, built off the Laurel mail system that let technicians in the fab area keep multiple things running through the fab, with processes changing all of the time.

NORBERG: Were the things running through the fabrication facility only designs from Xerox PARC, or did PARC do some work for other people in the academic world that had difficulty getting new integrated circuits?

WHITE: You know, I think so, but some of that I don't actually remember too well. There was a collaborative effort (the name of which I cannot remember) across research universities to collect designs and run a single fab for them. A multi-design chip. In other words, you would get multiple designs, figure out how to put them on the same chip in ways that you can isolate what part was yours, and, as a result, share across many institutions the expensive process of fabbing a design..

NORBERG: But as I remember from the DARPA project, the fabrication was being done by companies like Hewlett Packard, and they would squeeze it into their own schedule.

WHITE: We ran some of those designs as well. We would make some of those runs as part of our facility. There were designs being done as part of research at Xerox PARC. Xerox at that point, which is the early '80s, had its own electronics division in El Segundo, CA, which was manufacturing chips that were inside of the high-end printers and Xerox workstations. There was some collaboration between the product electronics division and the research Integrated Circuits Lab at PARC.

But then as things tend to go, all of this blew up about two years after I got there in an interesting way. Bob Taylor, who ran the Computer Science Lab that had produced amazing things, had a serious run in with Bill Spencer, my boss.

I was hired by Bill Spencer, head of the Integrated Circuits Lab. Bill had a lot of industrial experience and was quite well known in the integrated circuits area. As it turned out, Spencer was being groomed to take over the management of Xerox PARC. So I'm in this group reporting to Spencer, and then all of a sudden he takes a step, sort of across the street, and is Vice

President for PARC and he takes my group with him. All of a sudden, I'm still doing what I was always doing, but now I'm in meetings once a week with the heads of other labs ... meetings with Lynn Conway and Adele Goldberg and John Seely Brown, because they were all lab managers and reported to Bill Spencer. George Pake, who had basically run PARC from the beginning retired, and Spencer was picked to lead all of PARC. It was in this new role that Spencer had a huge run-in with Bob Taylor.

Bob Taylor was a brilliant manager, very much believing that what he had created and was creating was the best you could ever do in systems work. He thought he should have more resources and be given more freedom, and this will all pay off for Xerox. Bill Spencer, on the other hand, wanted to see more direct traditional management of the laboratories reporting to him. Spencer wanted to see a management approach and style that was just not the way Taylor managed. And so sometime in '83 to '84, Bob Taylor and over half - maybe two-thirds - of the Computer Science Lab left en masse and fairly soon thereafter went to work for Digital ... forming something called DEC SRC - Digital's Systems Research Center in Palo Alto. Bob Ritchie, a computer scientist from the U of Washington, was brought in to run the Computer Science Laboratory and my group was moved into CSL. So within about four months, I went from running a small group in the Integrated Circuits Lab to being a part of the Computer Science Lab under a new manager named Bob Ritchie.

My strengths to that point were not in individual research. I was much more of a manager running a small group initially, and then running a larger area of the Computer Science Lab, and then eventually being an associate lab manager and eventually lab manager of the Computer Science Lab.

NORBERG: When did you leave PARC? (I think we can follow this right along to the end of your stay at PARC rather than trying to squeeze it in when we're talking about ACM.) Did you stay at PARC for very long after Taylor and the others left?

WHITE: Yes. I was at Xerox PARC 17 years. I went there in July of '82. These issues surrounding Bob Taylor and Bill Spencer unfolded in '83 and '84. The Computer Science Lab under Bob Ritchie was up and running in the mid '80s. I officially left PARC in January of 1999 when I took the job here at ACM.

As it turned out, my strengths were more as a manager than as an individual researcher. As a result, my publications ended about the time I got to PARC..

NORBERG: Okay, tell me a little more about your work in the '80s at Xerox PARC.

WHITE: The Computer Science Lab was now under the influence of two key people ... Bill Spencer, who was managing PARC, and Bob Ritchie, who was the new manager of the Computer Science Lab. A lot of our focus was on regrouping following the departure of Bob Taylor and a core part of the lab. This focus included ensuring we had sufficient headcount to compete for the best graduate students coming out of good systems programs, and trying to invest in the researchers who stayed so that they did good research and were happy at PARC. In addition, we began to reconsider how to shape a new conversation about the benefits of PARC research to the Xerox bottom line.

Spencer was eventually appointed Vice President of Corporate Research for Xerox and moved to corporate headquarters in Stamford Connecticut. PARC was then run by three people: John Seely Brown, who had been head of essentially the AI of lab; Frank Squires, who had been at PARC from the very beginning, sort of the ultimate Chief Operating Officer if you will; and Ron Rider, a PARC researcher who had spent significant time with the Xerox Printing Systems Division developing laser printing. So PARC was run for a few years by a group a three.

NORBERG: Together as a triumvirate?

WHITE: Yes, as a triumvirate, this was kind of interesting. Bob Ritchie, the manager of CSL, was trying to get the work organized under a new management structure where the lab was organized around a set of areas. Bob Taylor never had areas. He ran the Computer Science Lab with a group of senior computer scientists called the Gray Beards — Butler Lampson, Jim Horning, Chuck Thacker, Ed McKnight, and a few others — who essentially set direction for the entire lab. So after Taylor left we created areas, and since this was a new concept for the Computer Science Lab, we only had two: software and hardware. I managed the software area — a rather large subset of the lab.

After a few years, Bob Ritchie left Xerox and Mark Wiser became manager of the Computer Science Lab in 1988. Mark had significant vision and brought a new level of energy to running CSL. I was made the associate manager for the lab.

NORBERG: What does it mean to be an associate manager?

WHITE: Well, it meant that Wiser got to spend time doing research, thinking strategically or “visionarily”, and I worried about everything else. I worried about the budgets, the resources, the connection to Stamford, Connecticut, and the rest of the company, to other labs—all these things. The management of PARC changed to be run by a single person: John Seely Brown.

After Mark Weiser became the new CSL manager, we held a series of retreats—this is about 1990—focused on what is going to be the research vision for CSL going forward? What’s going to be the focus that would help CSL make a real mark in the world? From these retreats came a vision that Wiser is still credited with — a vision that is now a common phrase — ubiquitous computing. From the retreats the leadership of the lab held, we decided that where we wanted CSL to go with systems research was to understand what it means to exploit the ubiquity of computing everywhere.

We took on three main projects. One was the scale of computing with a full-scale workstation connected to a huge screen. Another was focused on a laptop that was wirelessly connected. This concept — tablet computing — had never really been developed before (this is 1990). We hired a great PhD from Carnegie Mellon, not a computer scientist, but someone who understood electronics and analog circuits. He did research on building an early spread-spectrum radio system to support wireless computing. Finally, we had a third project, and third level of computing, active badges. These were very small devices that could track where you went. These were, in essence, the earliest days of ubiquitous, mobile, wireless computing.

NORBERG: There's a story that we always hear when we talk about Xerox PARC about how it didn't contribute to the bottom line for Xerox.

WHITE: It's funny because I still hear it as well, but I can debunk that story.

Xerox not only invested in the results coming out of PARC but Xerox reaped significant financial returns. Beginning in the mid '70s under Taylor the Computer Science Lab developed the Alto personal computer. Chuck Thacker led this development. Bob Metcalf and Dave Boggs developed Ethernet in 1976. Ethernet enabled Altos to be linked together and linked to print servers and file servers. In essence, by the late 1970's personal distributed computing was up and running at PARC. Then, of course, Alan Kay and others developed applications for this distributed computing infrastructure ... including window driven user interfaces, electronic documents, and the ability to move documents around an office.

In the late '70s, PARC researchers organized a major demonstration for Xerox senior management of the office of the future – all based on networked Altos running as workstations and servers. This event was held in Boca Raton. The old-timers at PARC were all involved. Senior management saw that whatever the office process was, the documents behind it moved seamlessly through a networked computer system, never being turned into paper until you needed to print a copy.

What Xerox then did is say, "Okay, this is the future, so we will invest millions to re-implement all these research prototypes into a high-quality, Xerox office product." This product was the Xerox STAR office system launched in 1981. What you had in STAR was personal workstations, the next generation of Ethernet for high-speed communications, print servers, file servers, and communication servers to build networks. The idea that Xerox didn't know what to do with this PARC research is just plain wrong. Moreover, the people on the STAR project were as talented as anybody in PARC.

While STAR was a sincere Xerox effort to bring PARC research in distributed, personal computing to market, it is the case that STAR failed as a product, and it's interesting to look at the reasons why.

The STAR office system really stretched the limits of the underlying hardware. To have this beautiful graphical user interface with documents flowing over networks required a level of computational power difficult to put into a workstation at that time. As a result, there were always performance issues. Moreover, a STAR workstation could not run stand-alone. You could not buy a workstation and just work offline, so to speak. Everything relied on the network. You couldn't boot the thing without it being connected to a boot server, or print anything without a print server, or communicate with others with a network communications server. And so a potential customer needed one or more STAR workstations at \$35,000 a pop ... and a communications server and a print server and a file serve ... each of which was pretty expensive.

In addition to the fact the upfront investment was pretty substantial, there were problems with the Xerox sales force. Xerox had a large sales force that was used to selling copiers and printers. It was a struggle for them to understand how to sell systems. In addition, much of the STAR system was proprietary and closed, and this limited opportunities further. Xerox Network

Services was fantastic and frequently described as “TCP/IP” with all of the bugs fixed,” but it was proprietary. The Xerox Development Environment was equally amazing, but was proprietary until after the launch of STAR. In the end you have a proprietary infrastructure that no one could build upon themselves with a product that you needed to invest a lot in to get the first one up and running. These were the issues that limited the customer base to a few big customers like Boeing.

This reminds me of the famous story of Steve Jobs coming to Xerox PARC, and Adele Goldberg at the Reception Desk arguing with PARC leadership not to let this guy in to see the Alto and what you could do with it. She was eventually overruled by Corporate Headquarters, I think because, I don’t know for sure, I think because Xerox had an investment stake in Apple Computer at the time. This visit happens in 1979. A few years later, the Mac comes out. The Macintosh is an Alto, but it runs all by itself. You don’t have to have it on a network. You don’t have to have this huge investment to get one Mac up and running. Most aspects of the Mac were fabulous, but not all. Apple Talk, for example, was never as good a networking protocol as Xerox’s XNS.

Anyway, the notion that Xerox didn’t invest in research coming out of PARC is wrong. STAR was not a success in the end ... but that had nothing to do with lack of investment.

Finally, regarding the payoff of PARC research to Xerox, consider laser printing. Laser printing was invented at PARC by Gary Starkweather and others. Laser printing products have generated billions of dollars in Xerox revenue ... billions. Revenue that far exceeds the cost building and running PARC.

NORBERG: Did you keep contact with Xerox PARC when you decided to come to ACM?

WHITE: I kept contact with a few people. I stayed in touch with John Seely Brown for quite a while, and I still run into people from PARC on a regular basis. When I took the job at ACM about a year or so later, for personal reasons I left Palo Alto area and lived in London, so it was kind of a long way. I’d come to the States frequently because of ACM, but I was in the Bay Area less and less. There are still a handful of people there I know.

Part V: Volunteer in ACM

Session 1, Tape 2, Side A

NORBERG: When did you join ACM Council and what were the issues of the day?

WHITE: I was elected to Council as a Regional Representative in 1984. What I remember is that as a Council we actually didn’t deal with very many big issues. We did decide that ACM Chapters were important and needed better oversight and integration with the rest of ACM. As a result we created a new board, the Chapters Board.

The other thing I remember dealing with in my early days on Council was the demise of the National Computer Conference. ACM was one of several sponsors of a major, horizontal conference that generated something like a million-dollar revenue stream for ACM. Over a three year period, this conference completely went away. Dealing with that revenue loss was not easy.

NORBERG: Wasn't the pending move of ACM Headquarters a big deal too?

WHITE: Looking at how we handle moves of ACM Headquarters is a good example of how much ACM has changed.

The first move I was involved with was a big deal. ACM, during Adele's tenure and Paul's [Abrahams] and Bryan Kocher's and half of mine, was housed on 42nd Street in a really small space, with a mainframe in the backroom running the database for the membership system. The lease for the facility was going to be up in 1991, and it was time to find new headquarters space. As an example of the old ACM, there was significant debate amongst the volunteer leaders about the new location for headquarters: Where is Council going to decide to put the new headquarters? Everyone had an opinion on what would be best for ACM. Almost everyone believed ACM must move out of New York City because lease expenses and staff expenses would be much lower almost anywhere else. Council actually established a volunteer committee to explore the question of where ACM Headquarters should be located and make a recommendation. Sure enough, we created something like a ten-person volunteer committee to sort out the requirements for, and recommendations on, a new headquarters location. This committee traveled all over the country being hosted by several cities that wanted ACM to relocate to that city ... cities like St. Louis and Oklahoma City and Omaha. Luckily, this committee was driven on the staff side by Pat Ryan, and she provided a much needed reality check. As the Committee was considering options and getting ready to make a recommendation, it was pointed out that if ACM moved out of New York, we would lose all of our staff. It finally began to dawn on the Committee that losing some staff was OK ... but losing everyone was a pretty bad idea for ACM. Eventually the right recommendation and decision was made, and Pat Ryan found 1515 Broadway in what is now the Viacom building. The building was coming out of bankruptcy in 1990, and Pat negotiated an amazing lease right in the heart of Times Square.

We just went through this headquarters relocation process again ... in August of 2006. Our lease was ending at the Broadway location. This time around staff (well, Pat) explored options with renewing our Viacom lease and then when that fell found new space and negotiated a new lease. We kept the executive committee in the loop and then we made a recommendation to Council that ACM move to 2 Penn Plaza and accept the terms of the lease that had been negotiated. Council agreed, and as a result, we spent virtually no time on the lease/move issue at Council. The Council time was available for more strategic discussions.

NORBERG: So that puts the executive director in a stronger position, I would think.

WHITE: Yes, but that doesn't necessarily keep volunteers from getting involved at too low a level in too many operational things. Starting '88 and '89 we began to try shift how the Council was working with the goal of keeping Council and the volunteers focused on items that are strategic leadership issues like what this association going to produce in serving its members ...

rather than worrying about where ACM headquarters would be located or who's going to report to whom on staff.

NORBERG: Speaking of members, what was the make up of the association member lists in the 1980s? Mostly academics, or half and half?

WHITE: It's only recently that we have begun to understand our membership really well and on a consistent basis. The only way we knew what our members did or thought in the 1980's was that periodically something would cause us to mail out a member survey. In these surveys, we got a sense of what our members actually did, but not in a way that anybody ... volunteers or staff ... paid much attention to. That said, I don't think the makeup of ACM in the mid-'80s was all that much different than it is today.

The makeup of ACM in the 1980's reflected a strategic shift in the association with respect to who it wanted to attract as members. Walter Carlson was the author of this shift, which I believe began in the late 1960's, and consciously led an effort to expand the ACM to reach out to and include what at that time were called data processing managers ... basically opening ACM up to the mainstream data center person, and moving it beyond just academics. ACM's roots were with researchers: both the academic side of research and the industrial side of research. Walter had a vision (I wasn't around for it; I just read about it and talked to him about it) that ACM should go beyond the 30 or 40 thousand members we had at the time, because we want to be a computing society for everyone. Computing was a small community in the late 1960's, and Walter's vision was for a society of 100,000 members or more.

Today, academic educators/researchers represent about 40% of ACM; and practitioners and managers 60%, and yet 80% of what we produce is for researchers and academics, and I think it's been that way for some time.

NORBERG: Well, would you say that the academics then had the majority of the benefits from the association?

WHITE: I think that's always been the case. Academics/researchers benefit a lot from what ACM produces, and they are one of the most highly satisfied communities within ACM. It was with the practitioners where we really struggled.

NORBERG: Was that not getting better in the '90s?

WHITE: It didn't get better until the mid-2000s when we had a long Council retreat focused on what to do for practitioners and managers. Also we began to regularly conduct a major survey of our members and do so in a way that was repeatable year after year. Who are ACM Members? What do they like? What do they not like? How has this changed from the previous year?

NORBERG: Sounds like that came out of this strategic planning committee, when they said that the surveys prior to 1989 were so disparate that there was no way to compare the entries across the years.

WHITE: That was definitely the case, and the situation continued even after that strategic planning report was issued. We only did a survey when we thought there was something we really needed to know, or we were at a loss as to what to do. My recollection, which may not be fair, my recollection is we'd end up doing surveys asking "What do you want so we can give it to you?" We'd get back a hodgepodge of stuff, and the results wouldn't really direct us in any way, shape, or form.

It wasn't until 2004, that we took the time to put together a serious, repeatable member satisfaction survey. This timeframe is when we began to do real market research at ACM, something that drives almost everything we do today, but it took us until the mid-'2000's. Steve Bourne, a recent president, had a lot to do with this shift. His industrial background would lead to him frequently saying "Well, who's your customer and how satisfied are they?" We spent, and continue to spend, significant resources with research firms to assess our membership and think about the future: How are we going to serve them?

NORBERG: Well, I noted a couple of things along that line that I was interested in. The Gallop Organization surveyed the members (I never really did find out what year it was). I was interested in who authorized this survey and the basic purpose of it. The results of the survey were that about 51% of the members belong to the SIGs and not to ACM as a professional organization.

WHITE: Well, that's changed.

NORBERG: Why would a Gallop Poll organization be brought in to do that? -

WHITE: I am guessing it was time to do a survey, for whatever reason as I noted earlier, and Gallop was used to give it more credibility.

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NORBERG: It seems like overkill to me.

WHITE: Yes, and do you know when that was?

NORBERG: No, I don't.

WHITE: Is there any information about what the survey was looking to figure out?

NORBERG: I don't have it with me.

WHITE: Okay. I kind of vaguely remember that survey.

NORBERG: It was done in the 1990s that much I can say. But how far beyond that it went, I don't know. All right, there are two other things of management in the Association that I found interesting, but did not have enough information to draw any conclusions about it. In December

of 1990 there was a leadership training program in the Association led by Will Goodman from UCLA. That's all I know.

WHITE: Leadership training? December of '90?

NORBERG: Yes, December 20, 1990.

WHITE: Do you know where it was held?

NORBERG: No, it didn't say,

WHITE: I was president then. I bet Ryan might remember that one. I sure don't. I did do a retreat when I was SIG Board chair over a long weekend—I was still at Xerox and was able to use the Xerox training facility in Leesburg, Virginia. We had staff and SIG leadership and other leaders in ACM together to really open up issues around SIGs and conferences, and how to support them. It was an attempt to do some group problem solving on issues. I remember doing that retreat.

I also have a vague recollection that every now and then somebody would decide that there was a program they had been in that would be good for volunteers. Volunteer development has always been a challenge for any organization and certainly for ACM; part of it is finding people that you hope are willing to help lead the organization. Then the other part is just training people, you know, getting them to understand how the organization works; how to work better together.

ACM was a slightly different organization then, different in that we had more volunteers spending more time doing more operational things that they really shouldn't have been bothering with. Today ACM feels very different. It is still led by volunteers, but there aren't as many boards now. The Boards that exist are more focused, and there's better staff support. ACM is more staff driven in the right way. And leadership training isn't something we feel like we need to do. Council has evolved to the point where we have a lot more leaders naturally focused on more strategic issues. .

NORBERG: Do you think this says something about the maturity of the organization as well? Because when I look at the development trends of the Association from Dan McCracken's time on into yours and Stuart Zweben's, I see a few areas where there's some critical transition taking place since 1978, when the executive committee began to run the agenda a bit more carefully than it had done before.

WHITE: '88.

NORBERG: '88's another one.

WHITE: That's what I want to talk about.

NORBERG: Yes, '88's another one, and then there's one in the middle '90s, according to Stuart.

WHITE: The thing that I remember as being significant was the idea that if we didn't get the leadership of ACM sorted out, the Association was going to be going in the toilet. So we started to work on restructuring the Council and downsizing it.

I remember two things. We were able to, without changing the constitution and working within the bylaws, reduce the number of regions. We put a plan together that would take Council from 26 down to something much smaller, and then Stu Zweben took it a bit further several years later when we redid the SIGs organization.

The other thing I remember doing centers on my time as Vice President. Bryan Kocher had run as a petition candidate and was elected president. Bryan was one of the regional reps that had been, I thought, somewhat disruptive at Council meetings and not all that helpful. Although Bryan won as a petition candidate, a woman I worked with at Xerox PARC and knew well, Sara Bly, was elected Secretary-Treasurer. In the end, Sara and I took it upon ourselves to basically run the Executive Committee and continue the push to restructure Council ... something Bryan wasn't that interested in.

Sara and I essentially said to ourselves, okay, we're going to have a smaller Council ... that will be the first step in producing a coherent, interesting Council meeting. The second step is the agenda. We decided we would really own the agenda of the Council meeting. At the time my benchmark was to think about what Bill Wulf, a very distinguished computer scientist who had joined Council would think of the agenda and meeting. At the end of the day, I would look down the agenda and say to myself is Bill Wulf going to find this an interesting meeting? There's a whole lot more we could talk about in that space. But I think we realized that unless we made the Council interesting, had them meet for shorter amounts of time, did more strategic and leadership thinking, we would never get the people on the Council that we wanted to lead the organization.

NORBERG: But who did step up to these challenges about leadership?

WHITE: Well, people like Bill Wulf and Vint Cerf. Beyond that, I would have to check.

NORBERG: Well, at one point along there you led a drive to identify a distinguished advisory panel for ACM?

WHITE: Who did? I did?

NORBERG: Yes. Led by you is what the record shows.

WHITE: Yes, I do vaguely remember that.

NORBERG: It was tied up with foundation business, trying to develop a foundation, trying to raise funds and so on, and back and forth it went: well, we can't really raise funds until we have a distinguished advisory panel; can't have a distinguished advisory panel if we don't have a reasonable knowledge of where we're going.

WHITE: Right. And a lot of what came out of these discussions was that the Council should be our distinguished advisory panel and making that happen was important. I do remember there was a real push to fix Council starting about '88. At my last meeting of Council in June of '92 much of the work had been done. We had just opened the new headquarters on Broadway, and we actually had the Council meeting at headquarters. There were two good things here. One was headquarters was nice enough to actually have a board meeting room, and Council was small enough to actually fit in it.

NORBERG: All right, computing has always been a multifaceted community. I think you would agree. And even during your tenure as SIG Board chairman on up to past president, it was represented by a number of different organizations. You mentioned a couple already like DPMA, a group that Walter Carlson had been trying to get in; there was AFIPS; there was the IEEE Computer Society. What was your opinion of these other associations in terms of what they represented versus what ACM represented at the time?

WHITE: That's a good question. The first thing I did as president was to call a meeting and put forward the motion that dismantled AFIPS. My recollection ... first of all, AFIPS was a federation of organizations, and it was dysfunctional. Second ... AFIPS, because it owned things that were very successful for a period of time, had a lot of money. As a result, AFIPS began to take on an identity and life of its own. AFIPS wasn't focused on representing its members; it was something else in addition to them, and actually began to compete with them. As a result, AFIPS to me was always an issue to be dealt with. We had many executive sessions of Council to discuss AFIPS. AFIPS was finally shut down in 1991 ... partly because of the points I just mentioned, and partly because its major revenue streams had dissolved.

NORBERG: Lots of personalities, too.

WHITE: Personalities and people feeling they were being treated unfairly by AFIPS, coupled with the debate about the role of the big societies vs. the little societies. There was nothing productive about AFIPS when I was around. The conferences were pretty interesting in the beginning, but again that didn't last too long. I came from the computing research community, as a result DPMA members were the workers that I never knew. I didn't read *Datamation* much, and I didn't read any other publications produced by that community. The society closest to ACM and to me was the Computer Society. I have been a member of both for most of my career. Another organization I never quite understood was the ICCP, The Institute for Certification of Computing Professionals. Being a CDP, Certified Data Processor, was something that was kind of a big deal in the '70s and '80s. I never quite understood why.

NORBERG: This is not accreditation that you're talking about?

WHITE: No, I was actually involved in accreditation. Accreditation of computer science programs began in the middle of Adele's term. She appointed me to be on the first CSAB board of directors. This is the last time I worked with Taylor Booth. He came from the IEEE side; I came from the ACM side, along with some others.

So the other organizations you mentioned all seemed a little different and a little lower level to me, except for the IEEE Computer Society, which sought to be on a par with us, but that was then.

NORBERG: That was then, yes; it's quite different now, isn't it? All right, let me just sort of summarize some of this now so that we bring this to a sharp conclusion and then pick up the other topics tomorrow. One of these has to do with ACM's role during the period from your becoming active in the Association to 1990. What role did it serve?

WHITE: In the period of the early '80s, if you look at what parts of ACM were growing, it was publications, conferences, SIGs ... parts that essentially served the research community. To the extent that we served the more practitioner-oriented member in the '70s it was largely through chapters. If you were involved in high level data processing, odds are you were part of a users group like the IBM Users Group. There were many strong ACM chapters in big cities, and that was another way you networked and stayed connected.

By the early 1990's ACM was no longer growing. Despite having reached out to embrace a lot of people in computing, ACM was doing its best job serving the academic and research communities. As I said, if you look at that time period, the number of publications went up significantly as we launched *Transactions* to cover different areas of computing, and the number of conferences increased. The accreditation of computer science programs in the US began, and for the first time provided some sort of quality assurance that served the educational community. There was curriculum work going on as well. We were serving the academic community better and better in that timeframe.

NORBERG: Were you picking up the other side of this? The programmers? The analysts?

WHITE: Not directly, and we still struggle with that. That said, there were some activities for programmers and analysts in our chapters, but "chapters" was not a program that was expanding, and wasn't, from my point of view, exhibiting a lot of success.

NORBERG: Speaking of your favorite journal, there were continual attempts, in a way, at trying to remodel *Communications of the ACM*, so it would serve this community better, "Software Pearls" and things like that.

WHITE: The remodeling of *Communications* was to deal with the complaints that were picked up in surveys, and periodically in other places, that *Communications of the ACM* was becoming unreadable for the majority of our members. Communications was publishing the top research results. It was to my thinking our most prestigious publication ... but many of our members couldn't read it.

Serving the practitioner, serving the non-researcher, has been an issue ever since I showed up at ACM. Our most significant effort to deal with this issue was to restructure *Communications*, a step that basically succeeded in upsetting the community that had been served really, really well, and never quite serving the community we intended it to particularly well.

There was a redesign in the mid 80's. There was another redesign in about 1990. There was another change later on in the '90s. The first two were to make *Communications of the ACM* more practical. The last one was to make it really much more magazine-like with shorter articles and fewer references per article. In the end, CACM became an almost completely staff-driven magazine, and in the process it lost its way so that at best it was mediocre, and nobody cared too much about it one way or the other. There was no passion around *Communications of the ACM*.

So what am I trying to say? *Communications of the ACM* did not improve or serve our practitioners particularly well. Some of the reason for this centers on who those practitioners are. Today ACM has 94,000 members: 70,000 professionals, 24,000 students. Of those professionals, two-thirds have masters and PhDs—advanced degrees in computing. When you look at ACM practitioners, 50% have masters and PhDs. These are not IT workers. The ACM practitioner is a highly educated ... likely self-motivated to stay at the leading edge ... probably wants to become the project engineering team leader. But ... the stuff we were flowing into *Communications* was essentially MIS material ... and, in essence, too lightweight.

It wasn't until the launch of *Queue* that we really started to deal with the ACM practitioner in a way that fit who these members actually are.

NORBERG: Who were the people behind *Queue*?

WHITE: Primarily, Steve Bourne. Steve was elected ACM President in 2002. Steve came from industry, but had little ACM experience. He had been at AT&T doing UNIX. He had been at DEC with the workstations group in Palo Alto ... at Sun doing Solaris. And he had been at SGI and Cisco Systems. And when he was elected ACM President, he was the CTO of a venture capital firm in Menlo Park.

In his UNIX days Steve had been involved with a magazine called *UNIX Review*, which was a monthly publication focused on UNIX, but put together in a rather unique way. Creation of *UNIX Review* involved getting an interesting board of the very best thinkers (who you could typically never get together) together once a month over dinner to pound out this magazine. And that's what we do with *Queue*. .

NORBERG: That's interesting.

WHITE: That's a whole other topic. Back to certification for a moment. There are industry vendor certifications, so to speak, and then there are certifications and standard approval stuff from professional organizations. It's not in the nature of ACM or the character of ACM to want to do that. I mean it's not in our DNA, because if you look at the IEEE Computer Society, especially today, they want to be the society for the IT professional.

WHITE: Well, I don't want to be an elitist, but we're not going after every IT professional. We want the highly educated, self-motivated IT professional. The last thing they need is a certification. Developing a certification is a massive investment, and even then it may not work. IEEE CS is struggling with that right now. With organizations outside the US certification tends to be more popular. For example, in the UK, the British Computer Society has redefined itself to be the society for the IT professional, and they are extremely focused on certification. In the US,

I don't know that it's worth it. Instead, ACM wants to produce *Queue* — we want to produce the greatest practitioner website and magazine we can. I think that's where ACM needs to stay.

NORBERG: You're keeping those members coming back, too.

WHITE: I hope so. We have indeed been growing for several years.

NORBERG: At one point you were the SIG Board elections adviser.

WHITE: Yes, the first thing I did on the SIG Board.

NORBERG: What was this for? You've talked about it briefly I think--

WHITE: SIGs hold elections every two years, and each SIG has to have a nominating committee that puts forward two candidates for every office. Headquarters runs the election once the candidates have been identified by the SIG leadership.

When I arrived at the SIG Board in 1983, I needed to take on a specific activity as everyone on the Board needed to be involved with something. I was listening to the report on the most recent SIG elections, and they were a disaster. Most of the SIGs had not completed their elections, and I learned that this situation was the norm. As a result, the SIGs were not getting the most effective leadership they could. More importantly, I just couldn't figure out why it was so difficult to complete SIG elections.

I agreed to be the Elections Advisor on the SIG Board. I met Pat Ryan who was the staff person responsible for SIG elections at HQ. I said to Pat, who I hardly knew, "I'm going to be elections advisor. I think we can run the SIG elections, all of them, on time." She agreed, and what we did was came up with a set of policies and procedures that were endorsed by the SIG Board that specified steps forward if a SIG didn't get its slate in on time; if a candidate for a SIG office didn't get their statements in on time, and so, in essence, we had a solution for every problem that had been delaying SIG elections. By the time we had these new SIG Board election policies in place, there was nothing that could prevent the elections from happening on time. And so it happened. I remember a Council meeting in '85 where Pat Ryan and I were acknowledged by Council for completing all 30+ SIG elections on time ... for the first time in the history of ACM. The result was that SIG leadership was refreshed regularly and this helped keep the SIGs moving forward.

My next step as SIG Board Elections Advisor centered on the fact that SIG officers would complain that, "Well, I'm just beginning to understand how to run my SIG, and now I must appoint a nominating committee to come up with new officers." As a result, I led a small effort to create extended terms for SIG officers, which was sort of a systematic way of allowing a SIG to choose not to have an election but to extend the terms of their officers if the membership didn't object. This step was again aimed at just trying to run elections and keep the SIG leadership effective. The whole thing was kind of fun.

NORBERG: Next on my list is a new vision for the ACM activities program?

WHITE: Me?

NORBERG: Yes, you. It was during your term as president. They're several things that I don't know much about, from the records anyway, even though there's a very good set of complimentary materials in the ACM records, which are now at the Babbage Institute. But there are a number of things that don't show up in the minutes and don't show up in the agenda. One of those has to do with the critical issues conferences that were beginning to be developed in your term, 1990 and 1991. I sense that those came out of the strategic planning report to increase awareness of the ACM.

WHITE: Well, certainly the need to increase awareness of the ACM was in the strategic planning report. When we talked earlier about needing to transform the leadership of ACM, we thought ACM needs to be doing something besides just having Council meetings. At least three things are directly related to that. One of them is ACM needs to have something to say on important issues; we need to be quoted. We need to start measuring how much press coverage we receive. Second, what is ACM going to be saying that might generate press coverage? This realization led to the second item – an ACM conference on critical issues. The third area, something we can talk about tomorrow, was creating the policy committee, USACM.

NORBERG: Which ones worked?

WHITE: ACM was a part of a conference in '89 on high performance computing, which brought the computing leadership community together to talk about issues in computing, computing research, and research funding. Some of this was preceded by Bill Wulf, who was director of computing at NSF, challenging the computing community to become more involved and more relevant in Washington. I really wanted to see ACM step up to this challenge ... to do things differently ... to start to be at the table on issues so to speak. As a result, we started to participate in meetings that we had ignored in the past. The '89, conference was one just meeting, and one of its goals was to help get the High-Performance Computing Act passed. The National Research Council's Computer Science Telecommunications Board was doing a study on the future of computer science, and they wanted ACM's opinion on various issues. I can remember saying, after we had restructured Council, "Okay Council, we have been asked for ACM's positions on certain issues." I forget the exact questions that we were asked to address, but I led an effort as president to get Council to address them so that ACM actually had something to say.

NORBERG: Did things like the K-12 initiative, work a on a national repository come up as critical issues considered in a conference in the '90s?

WHITE: National repository? I'm not sure. K-12 definitely, but that's only in the last seven years. ACM created a separate organization called The Computer Science Teachers Association in 2004. There is a National Science Teacher's Association ... a National Council Teachers of Mathematics, and now there a national organization for high school and middle school teachers of computing – The Computer Science Teachers Association.

NORBERG: We'll come back to that tomorrow.

WHITE: But all that stuff goes back to ACM needing to have something to say. And then once ACM had something to say, we needed to figure out how to get press coverage of it.

End of Session 1

Part VI: ACM Leader

June 2, 2009, Session 2, Tape 1, Side A

NORBERG: We were talking yesterday about ACM having something to say. I noticed in the minutes of Council meetings that there was a Washington Initiative circulated in the spring of 1990. Was that part of having something to say in Washington?

WHITE: Well, that would be a proposal for what became the USACM committee. Yes, I'm pretty sure. The Washington Initiative spring of 1990?...I think that was early thinking that we needed to step up to this challenge of being present and visible and influential in Washington. How to get started was the dilemma.

NORBERG: Yes, I would agree with that. All right, before we go on any further with this, I wonder if you would be amenable to giving thumbnail sketches of other officers that preceded you in the position of either president or vice president, and noting their strengths and weaknesses as you saw them. It would be nice to get your impressions of officers in the late 1980s about what had gone on before.

WHITE: So strengths and weaknesses. Let me take my immediate predecessor Bryan Kocher first. Bryan I knew as a member of Council. He was a regional representative. He came out of the greater Boston area. He was part of the Boston chapter, I believe. I should preface my comments by saying again that there are two big communities in ACM. There's the research, academic, and industrial research community; and the other community, which was reflected in ACM largely through the chapters. My experience in ACM is was through the SIGs, the SIG Board, the publications, the Publications Board, etc. So I firmly came from the research community. I was a researcher; I worked at a research lab; I ran a research SIG, I read research publications, etc. I was not involved in the chapters; I was not involved in the daily running of a computer center or anything like that. And so my bias was always a little bit more towards the research side of things. I think I lumped Bryan, somewhat incorrectly, in with the crowd of regional representatives on Council coming from the Chapters community, the other community mentioned above, that didn't have a lot to add in a constructive way, often derailed things, or brought up local chapter issues, which I didn't think were relevant. My bias. Bryan was not actually nominated to be president; he petitioned and he won on a strong platform of doing more for, I think, practitioners, the second community. I was elected vice president when Bryan was elected president, and Sara Bly was elected secretary/treasurer. The three of us became the Executive Committee, two of which worked at a research center in Palo Alto and Bryan was a consultant, I believe, in the greater Boston area. So I felt that when it was time to push the ACM in new directions about improving its leadership—you know, ACM being a leader in

computing—I didn't feel like Bryan and I spoke the same language. I was concerned, and there's a bit of that period where I think Sarah Bly and I ... I wouldn't say ganged up on Bryan ... but we certainly began to take control of the three-person Executive Committee. And in the process took control of what Council agendas would look like and how we were going to try and make Council meetings relevant. Sara and I would look at the items on a proposed Council agenda, and if we didn't think someone like Bill Wulf would find the meeting interesting, we would rework the agenda. Bryan was much less interested in that. That said, in the end Bryan was incredibly good at bringing new blood into ACM. He brought some really good people into ACM, people he just happened to know because he was out and about all the time. Gwen Bell got involved in ACM through Bryan Kocher's initiative. There were many others whose names escape me right now. Bryan was fearless in going out and connecting with pretty distinguished people and trying to convince them to get involved with ACM. From my point of view, Bryan was great at that. Where we always struggled was on any kind of shared view of the importance of the research community driving ACM.

Before Bryan was Paul Abrahams, who I knew quite well. Paul was from the research community, and he had preceded me in the volunteer leadership steps of ACM. He was SIGPLAN chair right before I was. He was SIG Board chair, I believe, before I was. He was ACM vice president, and then ACM president.

I remember several things about Paul. One, Paul was an absolutely beautiful writer. Whenever Paul Abrahams wrote something, it was just a delight to read. He was very committed to ACM, to attending to all the things ACM needed to attend to. The funny thing I remember about Paul Abrahams was his plan to control Council by using Robert's Rules of Order to its fullest extent. Paul was going to be more versed in Robert's Rules of Order than anyone around the Council table, and that was going to be his secret weapon. Well, it turns out Robert's Rules of Order don't really help. I mean they help, but they don't manage an out-of-control group or help get a group to actually do something important.

NORBERG: But there was a parliamentarian, wasn't there?

WHITE: Yes there was a parliamentarian and a formal committee on bylaws and the constitution. Any change in a bylaw or the constitution had to go through that committee. They also played a role, I think, in Council meetings, arbitrating what you could and could not do in a particular meeting.

NORBERG: I was under the impression that Robert Ashenurst played this role for a long time.

WHITE: I think he did then, and he still does. He, very much on his own nickel, still enjoys coming to Council meeting these days, and we set up a table for him to be the parliamentarian. He gets involved in the debate every now and then and will come up and whisper in the president's ear that "Well, you could have done it differently if you wanted to."

Getting back to Paul, he had lots of things on his plate. You know, Paul was president after Adele. Adele is a distinguished computer scientist, a recognized leader in the field. She wasn't an academic; she was from industry, even though it was a research lab, but it was a research lab doing real systems. She knew the computing business; she knew industry. She knew how to get

things done. She had no tolerance for idle conversation. She was a real powerhouse as president.

Every president in the 80's dealt with difficult Councils and had a model for Council deliberation. I think Paul had big shoes to fill in terms of trying to get as much done as Adele did. Adele launched ACM Press, did the strategic planning effort, and lots of other planning. That's where I remember the strategic plan being developed ... during Adele's term. It might have gotten reported out later, but she did it.

NORBERG: Well it did, but there's another particular interest here. Kocher believes that it was his initiative that the strategic planning group started, in order to make that report in 1989 that was so much talked about by the Council.

WHITE: It could be. I don't remember. But I do remember in Adele's term there was a strategic planning effort going on. What Bryan was around for was the restructuring of Council. When we had the meetings that led to that, Bryan was president.

NORBERG: I'll come back to the strategic planning report in a few moments. You didn't mention Dennis Frailey.

WHITE: No. Two things about Dennis are relevant here. He was the one the Nominating Committee convinced to run against me for president. I remember Dennis as vice president, and I thought he was a very thoughtful member of Council. I remember him bringing forward the question of "should ACM have a fellows program". He made a presentation on this at a Council meeting in 1985, I think. It was well thought-out, but the leadership of ACM was way too egalitarian and unfocused to feel like they should anoint any members to be somehow more recognized than anybody else. So Frailey's proposal for a Fellows program didn't go anywhere.

NORBERG: Then.

WHITE: Then. I invited and convinced Vint Cerf, when he was chair of SIGCOMM in about 1991 to fill a vacancy on Council. Vint said he would if and only if he could develop a proposal for an ACM Fellows program. That's where the fellows program we have today came from.

NORBERG: Why did he have more success than others?

WHITE: For one thing, we had restructured Council by then. We wanted ACM Council to be a leadership group with serious, recognized computer scientists on it, and it was becoming such a group. Secondly, I just think ACM was more ready for a Fellows program then.

NORBERG: The one other person who was still very active when you were on Council as vice president and then president and then past president is Peter Denning.

WHITE: Yes. I wasn't on Council when Peter was president. I think when I joined Council, Peter was running -- well, I am not quite sure what, but he was always running something. Peter is still involved. When I was president and appointed board chairs, I don't remember Peter being all that visible and active. I think he may have been on the Publications Board.

NORBERG: I thought he was editor-in-chief of CACM.

WHITE: Ah, he might have been editor-in-chief of CACM. Yes, I think he was EIC of CACM. But CACM was not something on my plate to worry about; we had other things to worry about. So I didn't really interact with him that much.

NORBERG: How did you run the committees when you were vice president? What was the way in which they were organized into a group that would meet with you? What was the result of that?

WHITE: It's interesting in that we had a model that all of the boards and committees reported to the VP; there was a bit of a process around it, which eventually faded and died. There was an annual meeting run by the vice president of all the board chairs, which was usually at the time we were kicking off the budgeting process and involved getting the boards to think about what their requests were going to be, beginning to roll that up into a budget, and then using that committee to make some decisions. As a result, all of the volunteer programs outside of the SIGs would say, "This is what we want to do," and we'd add up the number and we'd go, "Well, this is too big a number," so we'd start to sort of shoot holes in requests until people felt the numbers were in line with what we could afford. I remember doing that, but I don't think I did anything particularly interesting with the board chairs when I was vice president. I think we were focused a lot on the new model for Council, changing the nature of the Council meetings, and getting ACM to step into things it had not been doing.

NORBERG: Who does the accumulation of the numbers?

WHITE: Staff. A memo goes out from HQ to the five board chairs and the chairs of the committees that report directly to the EC to put their budgets together. What comes in is a fairly coherent plan, "This is the amount. This is the program. This is what's changed and why." We roll these all up into one document and then have a one-day budget meeting. The EC has really brought the board chairs and a few other key committees into the operational aspects of things in a way that's pretty good. That's how we do it now.

NORBERG: Is there a special person on the staff who handles financial issues?

WHITE: Oh yes. When it comes to the financial interface between the volunteer section of ACM and staff, it's Russell Harris, who is the Director of Finance. Russell is the one who pulls it together. There are a number of people that work in finance at ACM because we run so many independent financial things, whether it's 34 SIGs, 170 conferences, whatever. But when it comes to the association's finances and all the volunteer boards and committees, those are managed out of headquarters. The financial reporting systems are much more automated and up-to-date and transparent now. We used to have a lot of staff spend a lot of time generating monthly reports for various volunteer committees and boards. These reports would be mailed, and then they'd promptly be thrown in the trash. It just wasn't a very effective system. Today it's much more transparent and automated. Any volunteer can go straight into the finance system and see where the activity they are responsible for stands financially.

NORBERG: Are there any outsiders involved as advisers or auditors, whatever?

WHITE: Yes, but that has all changed as well. Some of that change is a reconstitution of things we used to have. As we streamlined Council in the late '80s and early '90s and beyond, we got rid of some committees that just seemed to be useless. We used to have a finance committee of ACM volunteers. The staff liaison was the ACM Director of Finance. The Finance Committee would fret over and worry about ACM finances. They'd worry about the cost of servicing a member; they'd worry about the dues or they'd worry about this and they'd worry about that. This has all disappeared. Financial issues, if there are any, are dealt with today by the Executive Committee. We have an Audit Committee now, and that was really set up as a result of the Sarbanes-Oxley bill in Congress. That bill set out a need for organizations like ACM to make sure that the Council was fulfilling its oversight role. ACM has had an annual audit by an independent auditing firm forever, but with an Audit Committee now, we actually have Council oversight of the process, selection of the auditing firm, and the management letters that come in from the auditors. Also today, we have an Investment Committee that oversees all ACM investments. This is something new, as we never had much to invest.

We really didn't do a good job with budgets in the past. No one seemed to own the budget and be in charge of how things went during the year. By that I mean the Executive Director in the 1980s didn't have enough influence with the Executive Committee of the ACM to say, "This is the way it's got to be." As a result, the Executive Committee had too much influence, and would demand that the budget be built a certain way so they could fund programs they wanted to do with money they thought would be there. As a result, budgets were passed that were not real. We would start the year with the assumption that membership was going to increase a certain amount which would help ensure a certain level of revenue. Then in the middle of each fiscal year, when these aggressive revenue assumptions were not being met, the EC would have to spend an entire meeting cutting planned spending for the rest of the year to bring things back into balance.

Joe DeBlasi made a lot of progress in cleaning up how we structured ACM's finances and budget ... making a cleaner separation between staff run and volunteer run programs. These changes made the finances of ACM much clearer. It's certainly the case today that we think very carefully about the assumptions on which the budget is built. Mid-year we began making realistic projections where we're going to end the year. By the time the year ends, we are within a few hundred thousand dollars of the most recent projections. In essence, there aren't any real surprises anymore, and we don't plan to spend money that we're not likely to have.

NORBERG: Were you around when Finerman was the Treasurer?

WHITE: No. I knew Aaron Finerman a little bit. He was Treasurer, but I think it was my early days and I don't remember his role or personality.

NORBERG: Because he seemed like a strong personality.

WHITE: The person I do remember as a strong personality in the whole financial area is Jack Esbin. Jack came from a SIG that was not a research SIG, but he was a really good manager. When he ran the SIG Board, he ran it very well. Then he was the ACM Treasurer for several

terms. He was very insightful. He did something that would really serve ACM well, and it was his idea. This is probably '86-ish, '87. He said, "Our headquarters lease is going to be up in 1991. We're going to have to move. This is going to cost money. We need to upgrade the computer system. We're going to need a big capital spend. We need to start putting money away in a Capital Improvements Fund." So he created a model for specified funds like the Capital Improvements Fund and convinced Council that this fund would be a good thing to set up. What was challenging was we didn't have any money to put away, and that led to starting to manage the ACM general—that is non-SIG—bottom line in terms of specified funds. So rather than being just an ACM general fund balance, which would have been negative or zero or a little bit positive, we set up this first specified fund, the Capital Improvements Fund, and we allocated money to go into it.

So we would run the ACM for a year. We would end the year with a general net. But the budget would include a transfer to the Capital Improvement Fund. We would ensure the transfer was made, even if we had to have a negative general net for the year.

We then created another specified fund called the Deficit Retirement Fund, which was a way of specifying how much we were in the hole. It wasn't smoke and mirrors. It was really just systematically saying, "We need to set aside money that is committed only to the headquarters move and then eventually we need to retire this deficit fund." Finally we set up a third specified fund, the Development Fund, to set aside money for starting new programs. This whole approach has served ACM well.

NORBERG: You said he was not a researcher. Where did he come from?

WHITE: He was the director of the computer center at the University of Toledo. I think he's since retired. But he was a very active volunteer throughout my entire volunteer tenure, and he was a lot of fun to work with.

NORBERG: Can we talk a little bit now about the international activities, because you're the first person that I came across that actually took a foreign trip on behalf of the international activities of ACM.

WHITE: Yes, and I give Joe DeBlasi a lot of credit for getting ACM to think this way.

When Joe DeBlasi became executive director, it was the end of my term as vice president and near the beginning of my term as president. Joe came out of IBM's International Standards Activities, which is sort of inherently international in nature, and felt that ACM was missing the boat by not being more explicitly international. We had members abroad and we had chapters outside the US, but we were still very US-centric in everything we did. So Joe really pushed the leadership of ACM to begin to build an international agenda. As a result, he and headquarters staff organized the first international meeting. We held a meeting of the ACM extended Executive Committee, not the Council, the ACM Executive Committee, in Zurich in August/September 1991. Was that the first one? Yes, I think it was.

NORBERG: It could be. In 1991 I know you made a trip to Russia on behalf of ACM.

WHITE: That was another trip ... one organized by ACM SIGGRAPH. For several years after, the Executive Committee would meet outside the US, usually in Europe. At these meetings we would conduct ACM business, and we would engage with ACM European volunteers. Most of these European volunteers were chapter leaders because that's kind of the only place we made the connection between ACM and Europeans.

In 1990 what we heard over and over was "The A in ACM stands for American. You're US-centric. You don't know how to service European members." And much of this was true. As result, we worked on setting up a European service center that would be seen as a way of making progress on serving international members, and therefore getting more non-US members and being more relevant outside the US? We outsourced the ACM European Service Center. Once it was up and running, Europeans could call ACM in a local time zone and transact business in a local currency.

We also had meetings with several European computing societies. These meetings were always a bit awkward because they felt like ACM wanted to come in and compete with them for members. The national society is trying to grow its membership, and ACM's trying to grow its membership from the same group.

Finally, we began to talk to our SIGs and explicitly encourage them to hold some of their conferences that were always in the US outside the US. That started a trend, and today many SIGs now hold meetings outside the United States on a regular basis.

If you were to look at my goals and objectives for this year (2009), the highest priority is still the international issue. I think ACM today has made a lot of progress, especially when you look back to the 1990 timeframe. Today 61% of our professional non-student members are from the US. This is down quite a bit I think from earlier decades. The percentage of ACM members from outside the US has been increasing.

NORBERG: That's a nice combination, though.

WHITE: It's very similar to the IEEE, and not that dissimilar from other organizations that are clearly American but are in fields where they are significant to the international community regardless of the fact that they are American. If you're doing chemical engineering in India, you probably need to have some relationship with the American Chemical Society. As a result, these organizations have about the same percentage of US/non-US members as ACM.

It has been a long process, and it seemed to take forever for ACM to not be US-centric in everything we did. For example, it took us forever to learn how to publish a phone number in an international format, to stop using the word "national" to mean the United States, and so on. It's just a million little things as well as some big things. That said, there wasn't that much business for the European Service Center.

What did happen is that the SIGs began to systematically hold meetings outside the US, and our two biggest SIGs, CHI and GRAPH, began to aggressively set up non-US chapters. SIGGRAPH organized a meeting in Russia in February 1991 that was essentially the equivalent of running a mini SIGGRAPH conference in Moscow. Joe DeBlasi and I went on this trip. I went as

president; Joe went as executive director. We talked with numerous organizations and individuals about ACM and about setting up more chapters in Eastern Europe and in the Soviet Union. We had Executive Committee meetings, as I said, in 1991 in Zurich. There were two additional Executive Committee meetings outside the US ... one in Amsterdam and one in Rome.

NORBERG: Is the attendance high at international meetings?

WHITE: Yes. Our conferences draw a strong European crowd. CHI, which is a big conference, was held in Florence last year and had very good attendance — and made a surplus.

NORBERG: While the international affairs situations were being discussed by Council and by officers, something called the Member Value Plus came into vogue in 1990. What was it?

WHITE: That was just a program Joe and HQ Staff cooked up for increasing the value of membership in ACM without really creating anything new. The MVP program was—and it makes sense—about striking deals with providers of computing-related products and services and giving price breaks to ACM members. So it gave us something to market, but that was purely a headquarters, a Joe DeBlasi idea.

NORBERG: I saw also at the same time a series of printed PowerPoint material that was about the MIS program in the headquarters. Now at first I thought it might have been yours, and then when I looked at what the concerns of DeBlasi were at that time, I became more convinced that it was him because the style of these things was IBM-style, which I've seen a lot of. Did this try to address the question of equipment, for example, new software?

WHITE: Yes. We had a hodge-podge of computing equipment and support in the old headquarters on 42nd Street. There was mainframe in one room that ran the membership database and a bunch of typewriters. As PCs began to come into existence in the early to mid-1980s, PCs began to show up at HQ. But there was no network; everything was stand-alone. As we planned the move to a new ACM headquarters in 1990, we planned to build a quality workspace for ACM employees. In addition, the move was the time to invest in the ACM headquarters computing infrastructure. That was Joe's presentation I believe ... "What are we going to do about the mainframe issue?" ... "What are we going to run the member database on?" ... and "We need to put together an office network of workstations on everybody's desk."

NORBERG: On a different subject, what are joint society membership agreements?

WHITE: We have agreements with several – mostly national – computing societies that if someone is a member the society, they can join ACM at a discount. Nothing more than that really.

NORBERG: So it's not really a part of your international agenda, is it?

WHITE: No. Our international agenda has really only come together in the last couple of years ... when we understood better what we were trying to accomplish internationally, and how the role of national societies and ACM's agenda all play. It turned out, ACM, despite what the IEEE

Computer Society says, is the first society in computing, founded in 1947. A couple of years ago, IEEE decided to redefine their origin date and made themselves one year older than ACM so they could be the oldest society.

NORBERG: Where does that come from?

WHITE: I think the Computer Society got tired of ACM being the “first computing society” as we used to describe ourselves in our tagline.

The IEEE-CS changing their age was silly. For several years we would celebrate major anniversaries of the ACM and four years later IEEE-CS would celebrate the same anniversary. We were founded in 1947; they were founded in 1951. So we celebrated our 25th anniversary in 1972 and they celebrated theirs in 1976. The same is true for the 40th and 50th anniversaries. Then all of a sudden they claim they were actually founded in 1946 and celebrated their 60th a year before ACM. They said, “Oh, well we decided there were some meetings of some subcommittees of the IRE that happened in 1946 that we claim are our roots.” Fine. It’s bogus, but fine.

NORBERG: That sounds bogus, from what I know about IRE.

WHITE: The interesting thing with respect to ACM’s place in the world and other societies is that being there from the very beginning and being aggressive in publishing and conferences, ACM and the IEEE Computer Society sort of staked out the space pretty early on. It’s not easy for a national society to launch a big computer science publication suite, so they tend not to do that because we’ve already covered it. If they do things, they tend to be very regional or national in their focus. So they’ll focus on their members and they’ll try to serve them, and more times than not it ends up kind of serving the practitioner who needs networking, maybe certification depending upon the culture of the country, conferences that are related to professional development and other things, but not running big international research conferences or having international research journals. I think as we’ve understood more and more, it makes a lot more sense how we approach the world. We’re not trying to compete locally with being the provider of the best local services for practitioners in a particular country. You know, how do you become a chartered IT professional in Britain? Well, that’s up to the British Computer Society to sort out, but if you want to be a part of the worldwide research community that’s thinking, “Where is the edge of this field going?” ACM has a real value. So it’s not so much that we compete; we just play on a different plane these days.

NORBERG: But they have to be the oldest.

WHITE: Well, the Computer Society has to be the oldest, but that’s okay. We cooperate and we compete.

NORBERG: Okay, you’ve mentioned a number of examples as we’ve been going along this afternoon, and I’d like to ask you to summarize it in the following way. Were there certain approaches and/or subjects that you felt ACM dealt with more effectively than others? By that I’m talking about time span.

WHITE: Dealt with more effectively then? I'm sorry.

NORBERG: I would say between 1980 and 1995, there were a number of things started in the early years that didn't really come to fruition at the time. Some of that was personality; some of it was money; some of it was just lack of interest. I'm curious if you have a view on how ACM dealt effectively, and what examples you would offer for that.

WHITE: Right. I think once we made a change in Council and were committed to getting Council to lead and the EC to lead, and under Joe DeBlasi beginning to have more aspects of the ACM staff-driven ... once these things were in place, initiatives began to happen differently. I think there was a better partnership between volunteer leaders and Headquarters staff.

One big example is the move that began in the second year of my presidency and led to ACM getting on the net in '92 as acm.org, beginning to use email, and launching the electronic publishing program, which was a combined effort of volunteer leadership and staff leadership and support.

The electronic publishing program was a big initiative. We had a vision of what we wanted to do, and we knew it was going to be very expensive. The goal involved moving to a completely electronic approach to publishing journals. In addition, once we had all ACM journals and other publications in electronic form we wanted to explore electronic distribution..

These two goals were the core of the electronic publishing program initiative that launched in '92. I believe Council gave their final approval to this initiative at my last Council meeting as President. I mentioned earlier that we knew this initiative was going to be expensive. We actually made an appeal to our members to make contributions to a new ACM Development Fund. Members responded really well and we eventually achieved the goals we established around electronic publishing.

When I was a member and then chairman of the SIG Board, I think there were three major things that we did. One was centered on SIG elections ... learning how to actually get the SIG community to carry out elections on time. The second was to relieve the SIG community of that burden of coming up candidates for a SIG election every two years with the notion of extended terms of officers for SIG officers. Then the other thing I think was most significant, that I'm most proud of, is developing something called the SIG Discretionary Fund. With the SIG Discretionary Fund we tried to do something across the association instead of through the myriad camps that existed.

NORBERG: Does it strike you that other people were doing the same thing at the time or later, i.e., managing in this way?

WHITE: Yes, I think so. I think in the SIG community there was a lot of work done soon after I moved on to other positions, work led by Mark Scott Johnson who was SIG Board chair for a while, working with ACM headquarters staff to restructure how the SIG community was supported by ACM headquarters. This involved not just headquarters deciding how they wanted to do things differently, but it involved getting the SIGs to feel comfortable about the support structure and their position in the ACM. This latter point led to a major piece of work

undertaken by Stu Zweben when he was president. The effort involved a complete reworking of how SIG oversight was structured ... going from the old model of a SIG Board with Area Directors responsible for a set of SIG ... to a new SIG Governing Board comprising the SIG Chair themselves. In addition, more SIG representatives (chosen by the SIG Chairs) were included on Council. It's one thing to have a good idea on how to solve a problem, and in each of these cases there was a problem to be solved. But it's another thing in the ACM to marshal the support for the direction you think is the right way to go. So whether it was the things I did or Mark Scott Johnson or Stu Zweben, I think there was a lot of effort to bring the SIG community fully into the ACM.

NORBERG: This strikes me again, as I said yesterday, that the organization itself was becoming more mature.

WHITE: Yes, yes.

NORBERG: So that might account for a lot of it.

WHITE: Certainly within the SIG that was the case. And recognizing that a big part of the core strength of ACM was in the SIG community was an important, but not always easy, step to take. The SIGs were ACM's best network of leaders in different areas of computing.

Part VII: Adjustments for a new era

There's a wonderful story about how we run our SIGs in ACM. It's very different from any other organization I've ever come across. In the ACM, SIGs are a part of the ACM, but they are allowed within ACM to function pretty independently, or autonomously I should say. There is a set of policies and procedures that are used to manage the SIGs, but one of the significant points in ACM history was the decision to allow SIGs to maintain surpluses from events they held, to use these surpluses to build a SIG's fund balance, and then allow them to use that fund balance on programs of their choosing. SIGs decided how to spend their fund balances and these SIG funds were outside the reach of the General (non-SIG side) of ACM. So here you've have 30-some-odd individual communities who, if they are successful in technical meetings, can build a substantial fund balance and use that fund balance to fund new ideas ... rather than constantly seeking funding from ACM. The SIGs are given the autonomy and responsibility to essentially manage their own financial futures. And what this model enables is keeping our SIGs alive and vibrant and ever changing. SIG memberships, the number of ACM members that hold one or more SIG memberships has declined substantially, but the level of SIG activity has increased. The number of conferences being held and the number of people attending these conferences is constantly increasing. The SIGs are very, very healthy, and it is, I believe, because they have this autonomy and this responsibility to run their own businesses in a sense. In other organizations with special interest groups, the groups are typically micro managed by the parent organization. In the IEEE, technical committees get a budget at the beginning of the year, and if there are any surpluses from any activities run in the interest groups, it all goes back to the IEEE Computer Society bottom line at the end. At ACM, those surpluses drop into a SIG's fund balance which rolls over to the next year. The ACM SIG structure empowers people in a way I have not seen in any other organization.

NORBERG: If I can make a statement about that, in the period from 1976 to 1990, there were several interactions between the headquarters and the special interest groups where the headquarters was looking to obtain some of the money from them and help the overarching organization in its activities.

WHITE: Yes. I had mentioned briefly earlier, but it fits into this context very well, the SIGs were given a major part of the business to run—conferences—and they were given the ability to retain the surpluses and drive those businesses, so to speak. While the SIGs are doing conferences, the general side of ACM still has a lot to do. It has to support the volunteer activities that exist outside of the SIG structure. It's got to tackle new programs whether it's new publications or new directions for policy work or education work. All these things are unfunded. There is no revenue associated with these kinds of activities. This situation presented a challenge to the non-SIG or what I have been call the general side of ACM ... or ACM General. There were times when ACM General was out of money or almost out of money or didn't have enough money to do something that needed to be done. On the one hand, we're running the organization with a substantial part of our operating funds under the control of the SIGs, but on the other hand, it was indeed one organization - ACM. There is no legal distinction between what the SIG's collective fund balance represents and ACM's reserves; it's all one big happy family. As a result, it was possible for ACM to build a budget in which they actually borrowed money from the SIG fund balance. In other words, ACM General might run a deficit, but the SIGs would collectively run a surplus. In addition, it was possible ... and a reality for several years ... the ACM General Fund Balance was negative, but the SIG Fund Balance was very positive.

In essence, ACM General “borrowed” funds from the SIGs and effectively paid them interest on that “loan.” There was a point, however, ... and this was a point in time before I was involved with ACM ...sometime in the early '70s ... where ACM was in serious financial straits and essentially had to look at taking over the SIG funds to keep the organization solvent. As I understand it, ACM was not following standard accrual accounting practices. ACM was booking revenues as soon as they were received and not accruing them over the period of time the services had to be provided. This led to a false sense of the financial state of ACM and ACM would get caught at the end of the day or the week or the month of the year with services to deliver but insufficient funds to cover the cost.

NORBERG: That's a bit dangerous.

WHITE: Right. And in fact Russell Harris, who is now Director of Finance at ACM, was brought in as a young financial person because he understood accrual accounting and nobody else did.

But ACM survived these early challenges and generally was on a solid track by the mid-1980's. But at the same time there were things ACM needed to do to raise our visibility and relevance as an organization, and we didn't have enough reserves ... or fund balance ... to initiate new, big projects.. The SIGs held all of the surplus fund balance. And thus the question became how does ACM General get the SIGs involved in thinking about using some of their reserves to fund association-wide projects that were in the best interest of ACM. As SIG Board Chair, I held a

few working meetings with some of the influential SIG chairs, and we came up with the notion of the SIG Discretionary Fund.

NORBERG: Oh yes, that's this item here (hands over a document).

WHITE: Yes, that's the fund I'm talking about. October '88. Oh, interesting. The idea here was pretty simple: at the time ACM was assembling the overall ACM budget for the coming year, each SIG would be asked to contribute funds to something called the SIG Discretionary Fund. This fund was in essence an association-wide project fund. But the decision on which projects will be funded was a decision made by the SIG ... not one made by the ACM Executive Committee or Council. The SIGs were asked to set money aside for worthy projects that weren't necessarily their own but were good for ACM, with the understanding that they would choose which ones got funded. In making their decisions, the SIG leaders generally looked for projects to fund that would be technically excellent, raise visibility and do good things.

So here I'm looking at this piece of paper from a report on the SIG Discretionary Fund, and this is when I was vice president/and past chair of the SIG Board. This is 1988. The SIGs have set aside \$1,050,000, which was a lot of money back in 1988, against which 22 potential project proposals were put forward.

NORBERG: Excuse me one minute, John. Who brought forth these projects? Was it the SIGs themselves or some combination?

WHITE: No, project proposals came from across the ACM. The ACM Executive Committee oversaw the operations of ACM on a daily basis. The ACM EC was also responsible for building the budget each year and, thus, deciding which projects would be funded from the "general" side of ACM. In this process volunteers who wanted to initiate something new, or grow an existing program, would ask the Executive Committee, "Is there going to be money for something like this? It's a good idea." With the SIG Discretionary Fund, the EC could say, "Well, it's a good idea. There's no general ACM money for it, but this is something to consider writing a proposal to the SIG Discretionary Fund for funding." So proposals would be developed by Board Chairs and Committee Chairs. Looking at the list here from 1988 there's funding requests for the ACM Programming Contest, the ACM Lectureship Program, for building a Capital Improvement Fund, the ACM Computer Chess Championship, ACM Computing Reviews, and the Guide database project, a European region newsletter, a careers in computing publication, and so on and so forth. There would be an all-day meeting prior to the SIG Board meeting where the authors of each proposal would outline the proposed project and funding request. At the end of the day, the SIG leaders would decide which projects were funded. I see that in 1988 there were 22 proposals and over a half million dollars of funding actually came from the SIGs. The SIG Discretionary Fund enabled ACM to do some things that were really rather amazing ... things that it had never done before.

One of the big things we did in that period was support a PBS program called "The Machine That Changed the World." This was a multi-part program on the history of computing, and ACM was invited to be the sole non-profit sponsor of the program. Unisys had stepped up to be the for-profit sponsor. The question was how can we raise half a million dollars? A good piece of the funding of ACM's support for that program came from the SIG Discretionary Fund. Not

all of it. Some of it was through a direct appeal to members. At the beginning of each episode you would hear “The Machine that Changed the World is sponsored in part by Unisys and the by the 80,000 members of ACM.”

Another project we never would have funded without the SIG Discretionary Fund was sponsoring a National Research Council study. When the National Research Council takes on a major study ... like the NRC study on the scope and meaning of computing and computer science ... they typically, unless the study is commissioned by Congress, have to find the money to fund the study. These studies are expensive ... typically on the order of \$100,000. We were asked to support one of these studies, and we found the money through the SIG Discretionary Fund process. This enabled ACM not just to provide input to the committees of the NRC doing the work, but to actually be a funder of some of the things the NRC did.

NORBERG: How would that work to the advantage of ACM? In more awareness?

WHITE: In the long run, yes. It helps show the world that ACM is taking its role as a computing society seriously. In other disciplines, there is a history of scientific and professional societies contributing to NRC studies. In computing, ACM stood pretty much alone in this space. Our friends at the IEEE Computer Society did nothing in support of NRC, and as a result, were rarely asked for their opinion.

So the SIG Discretionary Fund, for which I received the Outstanding Contribution to ACM Award, was really pretty amazing. It enabled ACM to take on, as an association, serious projects during a period that most of the operating fund balance was held by the SIGs. The Fund and the process also helped the SIGs to think outside the silos that represented their own technical subarea ... to think about computing in general and the ACM mission in particular.

Things have changed in the last several years. The SIG Discretionary Fund still exists; it's called the SIG Project Fund, but the dynamics and the financing of ACM have shifted dramatically.

NORBERG: When did that shift take place?

WHITE: It started in the late '90s. Soon after I arrived as Executive Director and Chief Executive Officer, we put ACM firmly on a path of careful spending and growing revenues. As a result we retired the debt ACM General had been carrying against the SIG Fund Balance. Holding spending was important, but growing revenue was really key ... and the revenue growth during this period was largely fueled by the ACM Digital Library.

NORBERG: Outside of the special interest groups?

WHITE: Yes. The ACM General Fund Balance has grown significantly over the past 7 years. The SIG surpluses have continued and the SIG Fund balance has grown as well. I don't know what the operating fund balance of ACM was back in 1988. Today it's nearly \$50 million. So the need to borrow money from the SIGs, or to annually get the SIGs to look at places they should be investing within ACM, is not needed in the same way now. That said, periodically, major programs will go to the SIGs saying, “This is important.” I mentioned yesterday the launch about five years ago of the new Computer Science Teachers Association for high school

and middle school teachers of computer science. CSTA does not generate enough dues revenue cover all expenses yet. ACM General and ACM SIGs have provide significant funding to CSTA because we all believe in the important of computer science in K-12 and the significant role of CSTA. I think it is really pretty special to see ACM now able to step into projects that we would have had to ignore in the past.

NORBERG: How does this compare with the years in which AFIPS was supplying something like \$1,000,000 a year?

WHITE: Ah yes ... AFIPS. Yes, ACM General ... not the SIGs ... being financially squeezed coincided with the demise of the AFIPS revenue stream that deliver \$1Million to ACM each year. It took ACM a while to replace that revenue stream. It really took until we launched the Digital Library.

Speaking of AFIPS, I remember in about 1987 Dave Brandin, who I'm sure you've interviewed, initiated an effort with his counterpart at the Computer Society, Oscar Garcia, to look at merging ACM and the Computer Society. We spent a year looking at the possibility. We even tried a few major joint efforts like a joint issue of Communications and Computer one month ... another was organizing a joint computing conference ... which we held it in the fall and called it the Fall Joint Computing Conference ... a name and a conference formerly owned by AFIPS, although AFIPS was in very serious decline at this point.

I think some people believed we could make money at ACM-run conferences, not SIG-run conferences. It was hoped that the "new" Fall Joint Computer Conference would replace the defunct Fall Annual Conference of ACM. None of this panned out. The new Fall Joint Computer Conference just didn't work. Nobody was interested in coming to a big horizontal technical meeting. This fact pretty much drove home the point that ACM was not going to make money from somehow resurrecting an annual meeting. We were still running a winter meeting, the Computer Science Conference, which had a relatively low attendance and was largely a venue for publishing weaker papers in computing across a very horizontal spectrum. This conference finally went away as well.

NORBERG: Did you encounter any faltering SIGs in the 1980s, 1990s?

WHITE: Oh yes. There were always SIGs that were weak. I'm a little hard-pressed to remember which ones they were. In the '80s, there was a certain dynamic always around the SIGs—some new ones being formed, some old ones struggling. It was easier to form new SIGs than it was to kill weak ones. There are lots of examples of this. We had a SIG on biomedical computing (although that wasn't really its name) that represented the interest of a few people who were concerned with computing in medicine and health, but there was no real community in that space that was in the mainstream of ACM. So this SIG on biomedical computing didn't have a well-defined vision for a primary conference in the area, which as it turns out is a key factor in the success or failure of a SIG. The SIG eventually faded. I forget the SIGs that came and went over which timeframe, but we had SIGs on specific languages as well as a SIG on programming languages. We had SIGAPL, We had SIGAda. Somebody wanted a SIGFORTRAN, but that idea was folded into SIGPLAN luckily. SIGAda still exists, and is a

small SIG ... running an annual meeting that serves a small community. We just closed down SIGAPL after years and years of debate.

In terms of new SIGS in the 80's, CHI is by far the most visible and successful. Today, CHI is a large and successful special interest group on computer/human interaction. It has deep ties to the worldwide research community in this area.

It's interesting to me that the SIGs that were led by, and had strong connections to, the research community have always been the most successful in ACM. Conferences have always been very important in our field. Those SIGs that were providing research conference for their respective research community drew in top researchers to help lead the SIG. This helped ensure a SIG's portfolio of conferences evolved, in the right direction and served essentially a built-in community that needed to be at these meetings either to publish or network. SIGs that served a more pedestrian aspect of computing always had smaller conferences, didn't evolve them very quickly, and didn't collaborate with other SIGs to create new conferences. That's why back in the early '80s when I was a SIG Chair, and later when I was chair of the SIG Board, the big SIGs were SIGPLAN, SIGGRAPH, and SIGOPS, and so on. They're still big, viable SIGs. They don't have as many members as they used to, but the level of activity they sustain is high. The size of their fund balances and their revenue streams make them very viable.

NORBERG: I'm trying to remember again something you said yesterday about policy efforts. I remember as early as 1974, there were some attempts, I will call them, at developing some sort of a position on policy. You mentioned yesterday that some members of ACM in the US were trying to help the Refuseniks in the Soviet Union. But I had the impression that you were sort of uninterested in that, in the sense that you weren't going to do any work in there. Is that true? In the policy developments within ACM?

WHITE: I got interested in helping ACM get into policy when I was president and Barbara Simons was on the Executive Committee as Secretary/Treasurer. Barbara was very passionate about seeing ACM engaged in policy issues. I worked with Barbara to convince ACM to take a major step in looking at doing public policy work in a systematic, on-going way. Prior to this, issues periodically came to Council that were not about ACM technical directions, but were about an aspect of either technology policy or scientific freedom. By the time these issues got to Council, they were a big deal. I'm sure that the Council discussion went on and on, and I think it was difficult for this 26-member body ... where some of them were interested and passionate and some of them were neither interested nor passionate, and some were opposed, and some were just passionate about making it a long, complicated conversation ... to debate these issues. Again, regarding my two-year term as president, one of the things I'm proudest of is the launch of a systematic, fundamentally different way for ACM to engage in policy work.

There were two aspects to this engagement of policy that were related but kind of different. One was getting ACM more involved in representing the community in places that needed such representation. This aspect of our engaging policy issues led to our co-sponsorship with the Computing Research Association of the conference in 1989 on strategic issues in computing. The conference mostly centered on high-performance computing and supporting the legislation that was emerging. Following this conference, ACM started to have a critical issues conference to investigate and speak on critical issues in computing. These kinds of meetings are hard to pull

off, but we were doing it. And we were stepping up to provide input to the National Research Council's CSTB studies.

While being a part of representing the computing community in policy discussions was good, we weren't systematically tackling public policy issues where computing technology was involved. But sorting out how to do that was fairly complicated, and we spent a good part of the two years I was president working on that.

Key to all of this was Barbara Simons ... a researcher at IBM, a very outgoing passionate computer scientist, who was very interested in both political issues and technology policy issues. Barbara wanted ACM to be the reasoned voice of experts from the computing community that people would listen to when it came to technology policy, or really any public policy that made assumptions about computing technology or policies that would impact the future direction of computing technology. But the challenge we faced was I think the experiences of the past: it took a long time to consider complicated issues, when they were discussed by a large body.

It took us a long time to decide how we were going to do policy issues, when what we kept hearing was, "You've got to be in Washington. You've got to act fast. You've got to know what's going on. You've got to be ready to respond. You've got to be ready to advocate," etc, etc. How are we going to do that, number one? Number two, how are we going to keep the focus on what ACM is about, which is computing, versus becoming political? How are we going to keep from becoming at that time an organization like Computing Professionals for Social Responsibility (CPSR)? They were out there with much more of a political agenda than a technology agenda. How are we going to keep from becoming that kind of society was the second question. The other question was how do we empower some group to act, but what do we do about the fact that only the ACM Council can really take an ACM position, which brings us back to the first issue of how to get Council out of the loop.

Eventually Barbara and I came up with the notion of what is now called USACM, which is officially the US Technology Policy Committee of the Association for Computing Machinery. USACM was set up in kind of a unique way. It was a committee, meaning that the chair was appointed by the president; members were invited by the chair and approved by the president. Okay, that's easy enough. Next, how do we deal with the fact that ACM is an international organization? We decided to have the charter of the committee explicitly indicate that the committee was focused on US technology policy issues. If ACM members in a different region of the world wanted to engage in policy issues in that region, we could form a committee of them called the Region X ACM.

Then there was the issue of who speaks for whom. The emerging USACM would need to act quickly, yet ACM has to reason carefully about what it does. We solved (or skirted) this issue by empowering the USACM Committee to speak on behalf of itself, meaning that they could write a letter and state a position. "This is the position of USACM, the Public Policy Committee of ACM." The reality is it's a USACM position statement reflecting the thinking of the subcommittee. If, on the other hand, they wanted to say, "This is the position of ACM," they would have to bring the issue forward to Council, discuss, and vote on it, which rarely happened. In the early days USACM was a small group and we had no reputation or recognition in Washington. But in reality, when USACM took a position as the public policy committee of the

ACM, everybody lost track of what was what. It sort of read as, “Hey, this is what the ACM thinks,” and that was good. It was ambiguous, so to speak, but clean.

NORBERG: Were there any objections to establishing such a group?

WHITE: I believe the motion to form USACM passed unanimously by the time we actually voted on it at the last Council meeting that I chaired. I think that’s because we worked through issues throughout the preceding year. Another issue with starting real policy work was the fact that volunteers can’t be expected to do everything; we would need staff -- a policy office. Well, we didn’t have the money for a policy office, nor did we have any clue how to build one and where to find a policy director. As a result, we began by collaborating with the Computing Research Association, which was relatively new. CRA’s transformation from the Computing Sciences Board into Computing Research Association was happening at about this time. An on-going concern was how is computing going to speak with a single voice? This new organization, CRA, was coming into existence to advocate on behalf of computing research. Their mission was the health and well-being of the computing research enterprise, mostly government funding for computing research. ACM had a much broader interest in technology policy, but we were not disinterested in research funding. How do you make sure that these two organizations... that were now heeding the call for “Somebody to come to Washington and speak on behalf of the computing community,” how do you make sure these organizations speak with the same voice? One way to ensure a coherent voice was to collaborate with CRA in terms of staff support. The first policy director for USACM was actually the executive director of CRA, who led CRA’s advocacy efforts. We sort of hired Fred Weingarten ... well, more like acquired a portion of his time. Yes, we sort of outsourced our need for a policy director to help us be a viable presence in Washington. That’s how we got the policy work launched.

Also, in setting up USACM, there was a concern about how to ensure USACM would not be political ... and stay focused on technology policy issues? Keeping that focus became a mantra of both support staff as well as successive chairs of USACM. When an issue came up, we would ask the question, “Is there a technology issue in play here, or is it purely political?” If there was an appropriate technology issue, then let’s understand what it is and what we think about it, and who the experts are in this space ... because they are the ones we need to bring in to educate policy makers. We didn’t lobby; we educated policy makers by bringing in experts.

It takes a long time to become established in Washington. ACM public policy activity has been in play since 1992. Today we have a very significant USACM committee and a fully-funded technology policy office with 2.5 full-time staff.

NORBERG: This is with ACM?

WHITE: Yes. The policy activity has really grown. That growth began when we finally moved away from the model of outsourcing our staff needs. In about 2001 we hired the first full-time ACM public policy director. We were fortunate to hire a young person with significant experience on the Hill with the House Science Committee. But, I did not want this single person to be in an isolated office of one somewhere in Washington. I talked to CRA, which was at that point run by Bill Aspray, and said, “If you have extra space, I’d like to rent some office space for our new policy person.” As a result, Jeff Grove, the first full-time ACM policy director, had a

real office context in which to do ACM's work. He could talk policy issues with Bill Aspray and their government affairs person. When CRA needed to hire an experienced policy person, Jeff helped CRA find a person from the Hill, Peter Harsha. When Jeff moved on from ACM, we tapped into Peter's expertise and network and found Cameron Wilson ... again from the Hill. We have now had ... for several years ... staff directors who really understand the legislative process and are well-connected. As a result, ACM now regularly testifies before Congress and helps move legislation in the right way by educating the staff that's developing it. USACM has really come quite a ways.

NORBERG: As a result of that, was ACM worried about your one person moving into CRA who might become a weak sister in this case and people would know that CRA was the real powerhouse here?

WHITE: No, I wasn't worried. In the early days ... when we were actually outsourcing our staff role to be filled by CRA's Executive Director ... it was a concern, and it turned out to be a reality. We had a series of at least two directors who had other full-time jobs leading other organizations. One was Fred Weingarten, who was leading CRA, and then later on it was Mark Rotenberg who was the head of a advocacy organization in Washington, Epic, which focused on privacy issues. In both cases, when you're doing that, the allegiance, the focus ... it's on the primary organization and promoting ACM is kind of a secondary thought.

NORBERG: Was the development of USACM and the Washington Policy Office part of a strategic plan.

WHITE: Strategic plans were done every three years or so. I remember one done during Adele Goldberg's administration, and I think Walter Carlson led a strategic planning effort under Bryan Kocher's administration.

The strategic plans work focused on the need to engage issues and start initiatives in new areas. So the fact that increasing awareness of ACM was part of a strategic plan, then yes, engaging in public policy issues surrounding technology was a strategic decision. The USACM Committee and the Policy Office were the steps we took to implement this strategic direction.

NORBERG: Okay. Well, I have one more thing to show you and that is the Executive Committee goals and directions of a year later.

WHITE: One thing I did after being elected president ... something Pat Ryan thought was very good, rarely done, and something that should be done by every new administration ... was that I got my Executive Committee together, Barbara Simons and Ron Oliver, at the very first opportunity and asked them "What do we want to accomplish?" And then "How are we going to do it?" What surfaced in that discussion was hammered into a set of specific goals we wanted to pursue as a new EC. We presented these to Council to get their buy-in and have the whole organization head in the same direction.

I've kind of forgotten how important it was to get the EC and Council involved. We wanted to consider several important issues such as under-representation of women, the health of science

engineering and computing as disciplines in 1989 and 1990. I do remember that we sat down as a group and decided what we wanted to accomplish.

NORBERG: Good. And did it happen?

WHITE: I thought a lot of it happened. The issue of under-representation of women and minorities studies led to the formation of two groups. One, ACM-W was focused on issues related to women in computing. The Coalition to Diversify Computing was eventually formed to worry about the issue of few minorities in our field. Worrying about the health and well-being of science in general and computing in particular—that was a bullet that covered a lot of things I was personally interested in. We were working with CRA and beginning to see the computing community have some influence on Washington priorities ... particularly funding priorities. K-12 and computing was an issue back then and are still an issue today. In fact, these three strategic directions are still very much what we're doing today.

NORBERG: It seems to me that there's some good relationship here between having been president and having summaries like the one you just looked at in terms of objectives of the Executive Committee, and what has happened since. Trying to continue oversight by ACM over these different activities was a new challenge for ACM, since that didn't happen before.

WHITE: There are a couple of things to remember. First, Barbara Simons, who was very influential on my Executive Committee, became president four years or six years later. Second, a CEO position helps provide some continuity in pursuing strategic directions. Also, frequently we have a vice president become president, and of course stay on as past president. If he/she's a good leader, like we've had several of, ACM gets six years of their leadership. So if things align right, you've actually got momentum and continuity in the leadership of ACM.

This was not always the case. In the 80's presidential candidates were frequently on the ballot via the petition process ... not the nominating process. I think Paul Abrahams ran by petition, I am not quite sure.

NORBERG: I don't remember now, either, but I don't think he and I talked about that.

WHITE: Bryan Kocher ran by petition ... twice.

NORBERG: Yes, and so did McCracken.

WHITE: And Herb Grosch ... I think. In any case, with petition candidates you have individuals winning elections and dropping into the presidency unexpectedly and without the context of two years as vice president. We haven't had petition candidates in a long time, and I think this is good ... and reflects that the Nominating Committee is doing a good job.

NORBERG: That sounds right to me from the things that I've looked at. What do you think the role of past presidents is for the association?

WHITE: Well, since we have the ability to have people be elected to the EC with little context, an important role for the past president is to provide continuity ... providing the ongoing context

for the current administration's discussions. The new president frequently tries to set their own agenda if they're aggressive and really care about the position. The past president can provide the context needed to put new ideas into perspective. So its continuity and keeping the agenda moving ... and it works well.

NORBERG: Okay, well that's just one person at a time. How about the past presidents collectively?

WHITE: We use them in two major committees of the ACM. One role is to chair the Nominating Committee right after you've been a sitting past president. This model works well because the past president knows who has been actively involved in the ACM and who, therefore, might be a good candidate for a position.

The other role is to participate on ... and eventually chair ... the Fellows Committee. The procedures for this committee call for having at least one past president on the Fellows Committee at all times. The Fellows Committee and program have become a big deal. The ACM Fellows Program is highly regarded, and it's increasingly difficult to become an ACM Fellow. So we do use past presidents.

NORBERG: But that's just individual.

WHITE: Yes. Collectively, you're right. The past presidents are one of two groups we do not use effectively. The other group is the collective Fellows of the ACM.

These days, we're not much into big celebrations of our anniversaries. In the past, general meetings around the 25th or 40th or 50th anniversary are times we would bring past presidents together. I can remember Adele Goldberg at the 1987 Fall Joint Computer Conference, the one that we co-developed with the Computer Society, using part of the meeting to celebrate ACM's 40th anniversary. I remember there was a section where there were a number of past presidents that got up and talked about the history of ACM. We don't do those kinds of things anymore. To be honest, by the time you've done six years of helping lead the ACM, it's time to get back to your real job without the time commitment required by ACM. That said, we should do more with our past presidents.

Part VIII: Xerox PARC, Again

NORBERG: Speaking of your real job, what were you doing during these years? I mean we talked about Xerox PARC up until about 1985.

WHITE: In that story I told about PARC, I said I started to move into management as an area manager and then associate lab manager. I became associate lab manager about the time I was elected ACM vice president, and I had the support of Xerox PARC to take the time needed to be vice president and then president. In fact, it was considered of value to PARC. I remember saying this when I received the ACM Outstanding Contribution Award ... saying that PARC took seriously their responsibility to contribute something to the profession. So I had PARC's support, and I had moved into management, so I didn't have a personal research agenda.

Then in March 1992 my career at PARC kind of turned on a dime when I was asked to, in addition to being associate manager of the Computer Science Lab, take over direct management of a small group. The group was a fairly tight-knit, seven-person research group that was really good at systems and imaging and was involved in building the software systems to do amazing printing on Xerox high-end printers on networks. Xerox, as a business, had figured out the mechanical and electrical engineering issues in producing very big printers for data centers, printers that would in those days print at 120 pages a minute, 300 spots per inch. These printers were plugged into controllers that were plugged into mainframes that were running tasks like printing American Express bills.

The printing business was, however, changing and Xerox was about to have their lunch eaten by Kodak because Xerox had no high-speed printers to put on a network. The Imaging Systems Group at PARC had been doing research on high level imaging and network systems, and they felt they could take a commercial SUN workstation and build a system that would enable you, on the one hand, to connect this controller to a network, and on the other hand, connect it to a high-speed Xerox printer and print postscript files at speed on demand ... things that seemed impossible to do at the time. Certainly the company was struggling to figure out how to do it, so this group became the complete engineering development team for a major Xerox product ... which was unheard of since major printing projects like this usually had engineering teams of 200 or more ... not 7. By about 1997 DocuPrint, the name of the product line, was a billion-dollar business for Xerox. I used to sit in my office and say "Okay, Xerox's revenues are \$18 billion. Let's see ... \$1 billion is DocuPrint. That's done by the seven of us. What are the other 90,000 people in this company doing?" [Laughter] It was an exciting time and really exciting work.

About this time ... that is about 1996 ... Mark Weiser stepped down as lab manager, and I was invited to manage the Computer Science Lab. At that point I was completely out of ACM volunteer work. As Manager of CSL at PARC I helped develop a research agenda that was very focused on electronic document systems and services. When I learned about the ACM position, one of the things that intrigued me was that ACM had just launched its Digital Library and I felt I had something to offer in terms of visions and experience related to electronic document services and systems architectures. As a result, when I joined ACM, the Digital Library was a major point of interest and focus for me.

NORBERG: So did you end up giving major amounts of your work to the Digital Library development, or was it just overseeing?

WHITE: It was more oversight. Remember, I've never lived in New York, so I'm in and out of ACM headquarters. In those early days when I was in New York, which would at least be once a month for a week, we had a series of meetings with the core developers on the DL and others. At these meetings we would keep everyone up to speed on developments, share visions, and think about what was possible. It was great. We didn't worry too much about what the competition was doing. We just said, "What's possible? Oh wow. We can do this, this, this, and this. That will be great. Can we really do it? Yes, we can ... so let's go!" We fairly quickly delivered several versions of the DL over the 1999 to 2001 period. We were agile. We were out in front in terms of what a digital library was and what it could do. It was fun.

NORBERG: Very good. I never leave an interview without inviting the interviewee to indicate to me what subjects I missed. There's always some subject that gets missed.

WHITE: Yes. You've been good enough to let me ramble on about many subjects as I remember them. But one thing we didn't discuss directly is: "What is it that makes ACM fun? Many people give a lot of their heart and soul ... a lot of their time and energy ... to this organization. For me, I was a good researcher but not that well-known, but the path into the ACM through SIGPLAN was just amazing. That there was a path that SIG elect their officers rather than appoint them provided me a chance to do something within ACM. Moreover there was a place for almost everyone in ACM to do something worthwhile if they were so inclined. Despite all of the ranting and raving during some of the crazy days of the Council, we did produce a steady stream of things like *Communications of the ACM* as well as a whole series of *Transactions* and run some great conferences. Despite a lack of strategic vision and discussion at Council in those days, we did not lose the research community ... luckily. And I think that's mostly because of our SIGs and our Publications Board. They really kept the research community and ACM together.

NORBERG: I remember when I interviewed Dan McCracken, he would say it was fun, and finally I had to ask him what he meant by fun, because it didn't seem to be my definition of fun. He then elaborated on it and was quite good about it. What do you mean by fun?

WHITE: I mean that it was fun to work with the other volunteers. It was fun to work with headquarters staff. It was fun to go to conferences and see how ACM worked and see what you could do with ACM. There were a lot of people involved, I think more so than today. At these week-long sets of meetings you would run into all kinds of people, and then see them six months later. You would interact by mail or the telephone in between. And yes, I enjoyed it. So when the opportunity came to be ACM's CEO, it represented a step that was pretty seamlessly connected to the very positive experience I'd had in my professional career.

NORBERG: Well, thank you very much. I appreciate all the time you've given to me.

WHITE: Oh, you're welcome. You're very patient, and asked a lot of good questions and did good research prior to the interview.

End of the Interview