Oral History of Richard Canning

Interviewed by:
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Richard Canning

Conducted by Software Industry Special Interest Group—Oral History Project

Abstract: Richard Canning, one of the early electronic data processing pioneers, recounts his personal background, education and Army Air Corps experience. He describes his initial work at Globe Wireless and IBM and his family's decision to move to California where he then became interested in job shop scheduling and simulation modeling of factories. He joined with Roger Sisson to form Canning, Sisson and Associates in 1954 and reviews a few of their consulting assignments before they closed the company and went separate business paths. He talks about the EDP Analyzer which was his principal business activity over the next 23 years and the Data Processing Digest which he and Roger started and was continued by for many years by Margaret Milligan. He talks briefly about some of his professional activities in the computing industry.

Background and Education

Burton Grad: I'm Burton Grad and I'm interviewing Richard Canning, usually called Dick Canning, and this is part of the Software Industry Special Interest Group oral history project. It's March 27, 2007 and we're at the Computer History Museum in Mountain View, California. We have some reference materials available, which we will be not repeating during the interview. These materials include an interview that was done by the Smithsonian Institute in 1973 and another one done by Jeff Yost of the Charles Babbage Institute in 2002. Both of these oral histories are available and can be obtained from those institutions. Dick, I'd like to start fairly early on from a family background standpoint. What did your parents do and what were your interests when you were growing up?

Richard Canning: My dad worked for the Long Lines Division of AT&T, which he thoroughly enjoyed but it did mean that we moved around the country to a fair extent. In my senior year of high school, he was transferred from the Cleveland office down to Cincinnati and decided that since we had to move, we'd spend the winter in Florida, which was a very pleasant thing to do, and then we went to Cincinnati. I had to go back to Aurora High School to graduate but then went down to Cincinnati and started in the University of Cincinnati in the fall.

Grad: As a teenager, did you have any hobbies or anything that related to electronics?

Canning: No.

Grad: Of course, this was in pre-computer days.

Canning: Those were radio days, and no, I was doing nothing like that. My dad felt that since I was fairly proficient in math -- although not a mathematician, I could handle most of the high school algebra and trigonometry and so on – he remembered a man who made a very good living as an actuary, so he thought that was the work for me. Well, I entered UC, University of Cincinnati, to be a major in math, but had no idea whether I wanted to be an actuary at that point. A little later on I had firmly decided that no, I did not want to be an actuary. However, the math major turned out to be very useful and got me eventually into radar and electronic training.

Grad: Did you get your degree from the University of Cincinnati?

Canning: Yes, I got a BA, major in math, in 1940.

Grad: That was before the United States got into the Second World War?

Canning: Yes.

Grad: Did you take any graduate work at that time or later on?

Canning: Yes, I've had a fair amount of graduate work, none of which added up to a degree. I was drafted and then eventually applied to be a communication cadet and became a second lieutenant, because of my major in math. I wanted to go out as a squadron communication officer, but no, they wouldn't accept that. I had to go to Harvard and MIT and I've forgotten the name of the program; it was strictly a wartime program.

Grad: Is this the V12 or equivalent to the V12?

Canning: No, it was something like three months at Harvard and three months at MIT.

Grad: Tough duty?

Canning: For Harvard, they pulled together professors from around the country to teach electronic engineering as it would apply to radar, so we weren't getting electrical engineering and power transmission; instead, it was the use of vacuum tubes for radar. The Harvard part of it was unclassified, although we weren't really supposed to talk much about it. The MIT part was very much classified and we were not on the MIT campus, we were at the Harbor Building right down by the harbor where they had some of the old radar sets installed. Those were the days

when radar was so new that there weren't any extra radar sets for us to learn on. They were going strictly into the airplanes for the Army Air Corps.

Grad: So these were the airborne radar?

Canning: That's what I was involved with, airborne.

Grad: Let me skip ahead now. You were in the Army Air Corps until basically 1945-46?

Army Air Corps Experience

Canning: Yes. After some specialized training on a radar bombing set I was sent to Kansas. In Kansas, the B-29s were just coming out. We weren't supposed to talk about the B-29s.

Grad: What you did in the Army Air Corps? Were assigned to B-29s?

Canning: I was assigned to the B-29s and I was sent overseas, from Kansas to India. I went by ship. Most of the radar operators that I was in charge of flew over, of course. The funny thing was that none of the men that I knew in Kansas ended up in India. They were replaced by other people. However, it worked out all right. We were one of four bases in India of B-29s with forward bases in China and had to fly over “the hump.” We would have several ferry missions carrying gasoline to China, to build up a supply of fuel before flying a bombing mission to Japan.

Grad: Were you actually flying then at that point, were you in the planes?

Canning: Yes, I would fly as a radar operator on occasion. I would check out a radar set and fly it over the hump. I remember on one trip, I wanted to check a set that had been working very well but unfortunately we followed the Army's procedures that every so often you should do a complete check of the vacuum tubes, so we had pulled all the vacuum tubes out of the set to check them and of course the set didn't work very well after we put them back in. So we learned from that. However, on this particular trip I was operating the radar set and I would talk to the pilot and I'd say, "I see a mountain ahead,” and finally I'd say, "I can see a echo just beyond," so that meant we were above the mountain. However, the pilot could see it himself, so he wasn't depending on me. But it wasn't a particularly good radar set. Unfortunately, the next trip after the one that I went on, the plane crashed into a mountain and everybody was killed. I’m pretty sure, from what I was told, that turbulence caused the crash.

Grad: Glad you weren't on it. Okay, you told in the Smithsonian interview that you were then sent back to the states in 1945?

Canning: Yes, all of the four groups were switched from India to Tinian and Guam. They had been captured by that time and the air bases had been built. I was sent back to the States for training on a new bombing set, but the war ended while I was home and didn't have to go to Tinian.

Working for Globe Wireless

Grad: You've covered that in the other interviews, so let me move ahead. You then end up getting discharged. Were you married to Peggy by that point?

Canning: Yes, and we had a baby. Barbara was born by that time.

Grad: So that was in 1945?

Canning: That was the end of 1945.

Grad: You then go look for a job and again, you've covered some of this.

Canning: Peggy's uncle was a lawyer; I don't know if he was on the board of IBM.

Grad: What was his name, do you remember?

Canning: Yes, it's Lamar Hardy, Lamar Hardy. And I think that he'd been district attorney for the southern district of New York. I think he was an influential person, and so he talked to Mr. Thomas Watson, Sr. but I didn't get a job at IBM, I got a job at Globe Wireless. IBM at that time was producing a product called Radiotype. I was with Globe Wireless, I was supposedly overseeing the production of some quantity of Radiotypes that IBM was producing, turning them over to Globe Wireless and then they were washing their hands of the product. It was too big a competition with the telephone company, which was a good customer of IBM's punch card machines.

Grad: I think your Smithsonian interview covers that in some detail.

Working for IBM

Canning: Yes, I think I pointed out that when that production run was finished, I didn't want to move to New York with Globe Wireless, so IBM gave me a job in Endicott.

Grad: In Endicott, New York, the same place where you had been working for Globe Wireless?

Canning: That's right.

Grad: Let me skip ahead a little bit. In your time at IBM, what were the two most interesting assignments that you had there?

Canning: Well, clearly the most interesting thing was an evening course that I took on using the punch card machines for manufacturing control. In the course of this -- it was something like 8 or 10 or 12 evening sessions -- the instructor said that they didn't have a manual or textbook. So I took pretty good notes and after it was over, I spent evenings and weekends writing up a textbook based on those notes. I turned it in and indicated to the education people, "Gee, I would really like to work on this." The use of machine technology to help improve production and manufacturing control, intrigued me. I wasn't particularly interested in how to wire the plugboards. That could've come later once I knew what I wanted the machine to do. But at that early stage, I just saw the outline of how you'd use data processing for manufacturing control. But because I was an electronics engineer, they said, "No, I could not be transferred into education or into manufacturing control, I was going to stay put in engineering."

Grad: That was a question I was going to pursue. You have this fine engineering training, you have electronics training and yet on the other hand, had you ever written much before, had you done any manuals or anything like that when you were in the armed services, when you were in the Air Force.

Canning: Oh yes, two times. In the Army Air Corps over in India, I wrote a manual the operators could use, what to do if the radar malfunctioned while they were on a flight. And then at Globe Wireless I wrote a manual, a service manual, on how to fix these things for the maintenance people out in the field.

Grad: Your writing style has always been very clear, very simple, very direct. I find you one of the most direct writers in that the sentences are very straightforward. Did you have that then or is that something you learned since then?

Canning: Well, I think I had it then but the thought that comes to my mind was my poor communications ability. For that manual I did for the Air Corps, I heard that there was a cartoonist on the base and I figured that two or three cartoons in this would help a great deal, you know, lighten it up a bit. So I went to see him and I said, "Now, all I want is two or three cartoons, but here's a bunch of ideas. Now, I don't know which ones are going to appeal to you." The message he got from my comments was that I wanted about eight of these cartoons, so clearly I wasn't very good at communicating.

Grad: That was oral communication?

Canning: Yes, that was an oral communications error.

Grad: That's interesting, because you've spent a significant time of your life writing, right?

Canning: Yes.

Grad: It becomes the central part of your career, rather than engineering type of work. But were there any of the engineering assignments that you remember at IBM that were of particular interest?

Canning: At Endicott, I was in the department that would get reports from the field of problems, not the new development of machines but what was wrong with the present machines. The collator that did the merge and match function was the one machine that used vacuum tubes at that time. I believe that it used power amplifier tubes. We started getting reports from the field that indicated that these tubes were going bad at an alarming rate, and I remember working on this. I was asked if there was such a thing as cathode poisoning? Vacuum tubes in general use then were for amplifying signals and driving the loudspeaker so that they were constantly conducting current. There were greater or lesser amounts of current always flowing. In the IBM use, however, they were on or off, and the point was if they were off for an extended period of time, was something bad happening internally, chemically probably and I said, "Oh no, I didn't think so." But it soon became apparent that oh yes, that was exactly what was happening. And I can't quite remember the end of that project, but I think that we pretty well solved that the same way we later solved the problem of acceptable vacuum tubes for the 604 electronic calculator. And that was to have the vacuum tube manufacturer inspect a hundred percent of the tubes, not sample check but a hundred percent, and the tubes that they didn't want for radio use had the features that we wanted for IBM use. That same thing happened on the 604 vacuum tubes where there were over a thousand 6J6 vacuum tubes, TV amplifiers, and RCA put them through a hundred percent check and those that failed were exactly what IBM wanted.

Grad: Isn't that an interesting story? That's a fun story. And you mentioned in one of your interviews about going on tour with the 604 and how well the vacuum tubes worked.

Canning: Oh yes, we went from city to city to city, with the 604 being trucked around, and that whole time I think only two tubes had to be replaced.

Grad: That probably may have helped give IBM confidence that they could go ahead with a vacuum tube computer, because I remember working on the 604 and it was a very

reliable machine. I'm going to skip ahead now. Did you leave IBM to go to work at the Naval Air Missile Test Center at Point Mugu? What was the reason for the move?

Moving to California

Canning: Oh, I don't think Peggy and I were very attached to living in the northeast. I had met her in Tucson when I was stationed there. During the winter of 1949-50, Barbara, our oldest little girl, was in kindergarten and she would go out in the snow, and it was not real cold snow, it was sort of wet snow, and she'd get soaking wet, catch cold, stay at home for three days getting over the cold and then the process was repeated. And we said, "This is not the way to live." And I think I probably mentioned in an earlier interview that we asked our Congressman how I could get a book called Climate and Man published by the Department of Agriculture. Two weeks later here comes Climate and Man with compliments of Edwin Arthur Hall stamped all over it. We searched in there, where it had weather data for every county in the United States. We searched for what the weather was like, summer, winter and all the rest of it down the east coast, Florida, up through the Gulf states, across Texas, New Mexico, Arizona, California, up the west coast, Oregon, Washington and included Nevada and Utah. There was just no competition. Southern California had the best climate, no competition. So I began searching, writing letters and finally got an interview in New York with people representing the Naval Air Missile Test Center, at Point Mugu, California.

Grad: That's when you decided to leave and go out there? You've been in that area ever since then, haven't you, from 1950 on?

Canning: Yes. That was 40-50 miles north of L.A. and now we're 100 miles south of L.A., so that's where we've lived since then.

Grad: When did you move to Vista or the area near San Diego?

Canning: We moved to Vista in I think it was early 1959. Roger Sisson and I decided to end our partnership in the fall of 1958 and as soon as that occurred, there was nothing that tied me to Los Angeles. So we started searching and picked Vista. It was the first town south of Los Angeles that was independent of Los Angeles and was about eight miles inland. I wanted to be far enough inland because the weather was a little better.

Grad: Terrific decision. Let's talk a little bit about your pre-Canning, Sisson days then. I want you to focus on a couple of things. You did some early work in the simulation area. What kind of things were you looking at? What kind of applications were you considering?

Canning: While I was working at Point Mugu Naval Air Missile Test Center, I still had this hankering for data processing. And I heard about this project that Mel Salveson was setting up

at UCLA. So I went down and interviewed Mel, told him my background. And one of the things I hold against Mel is that he called the Navy right after I talked to him; he called Point Mugu to find out something about me and I thought, "Hey, you know, in private industry I could be fired for something like that." But anyway, I was hired and it was clearly a research project, on how to manage job shop production for efficiency.

Grad: Was this a dispatching problem or something different from that?

Canning: The problem is that there are thousands of individual orders to make: here's an order for making 50 of this part, and here's another for 75 of some different part, and they each follow a different path through the factory, drilling, cutting, bending, painting, all that. And the thing is that you would never know, in advance, when a department would suddenly get overwhelmed with jobs flowing into it from many sources, while next to it was a department that had nothing to do. And finding the optimum solution is almost an unsolvable problem, I mean, it's so huge. When you get to a fairly good-sized job shop like an aircraft factory, even when they're making planes for the airlines, because it turns out that every plane is different. For the military they might be making a whole series of planes that are identical one to the other. Anyway, the fact that all these differences can occur meant that production management was just a huge problem. I think we recognized early on that the optimum solution would not be found in our lifetimes, but if we could just improve things, that's what we were seeking.

Grad: Who had the idea of doing a simulation in order to check out the ideas? This was called a job shop scheduling problem if I remember correctly.

Canning: Well, the thing I remember was I wanted to find out a little bit more how this phenomena worked where a section of the factory would suddenly get overloaded and the only computer we had access to was the SWAC, Standards Western Automatic Computer, which was programmed in machine language, by the way. I tried a little bit to program it and saw that this was not my strength. We found that Roselyn Lipkis had the skills needed. She had to leave the Institute of Numerical Analysis of the National Bureau of Standards, when she had a baby, but at home she could do programming and so we got her to do the programs for the very early simulation on the SWAC.

Grad: Okay, but the idea that you could actually create a model in the computer, where did that come from? That was a new idea, wasn't it? It's modeling a factory floor. I think that's when it was first done, in the early 1950s?

Canning: Yes, I guess so. It just seemed to me that that was something that we had to look at to see what were the characteristics of these service facilities as jobs flowed into them of different runtimes or production times and one just didn't know when they were going to arrive.

Grad: Was Alan Rowe there then?

Canning: Yes, I think Al was there.

Grad: How about Roger Sisson?

Canning: No, Roger was not there.

Grad: So you had Roselyn build the model and then you tested or used that model to see what would happen?

Canning: It was so elementary that I wanted to expand on the model and went to the fellow who was in charge of the Institute there, a good administrator and a mathematician, and he said, "Here is what I want you to do." Because machine time was very valuable, he just didn't want to turn it over to anybody, so he said, "I want you to study queuing theory and make a survey of queuing theory, and see if you can't solve this problem with queuing theory." Right off the bat, because I had studied enough of queuing theory to know that the restrictions that you have to put on it, the limitations, meant it was just not suitable. We wanted to have alternate routes through the factory and so forth, if you run into a bottleneck here, what can you do to get around it and queuing theory just didn't do that, and simulation is what I wanted to do.

Grad: In your notes here, you indicate that Roger did join the project somewhat later on.

Canning: Yes, that's after we set up Canning, Sisson.

Grad: So you continued to be interested in the simulation area for quite a period of time?

Canning: Yes, but I'd have to say that Al Rowe picked it up and he's the one that carried it on.

Grad: Now, I knew Alan Rowe when I was at GE, and he was working with us at some point in time. Was he an employee at GE at that time?

Canning: No, he was not. He was on our UCLA project. The next thing I knew he was down at the University of Southern California, USC.

Grad: I think Alan Rowe ended up doing work at Rand if I'm correct, did. He was well known at the time. He got his doctorate in this area on job shop scheduling and dispatch rules

and things like that. I know at some later point, I'm interjecting here, but GE did work with Cornell on simulation models and I believe the man's name at Cornell was Conroy who did the simulation models there, but by then we had the use of more general purpose computers.

Canning: Yes.

Grad: The SWAC machine was a relatively limited machine if my memory serves me correctly.

Canning: Yes, the SWAC model was so kindergarten that it was really just the first step, and I wanted to expand on that and in essence I was stopped.

Grad: Okay, let me move ahead then. I want to look at your seminar work briefly. Was the first time you did a real course was when you were at UCLA?

Canning: Yes, I gave an evening course. I don't remember the original title, but it soon was titled Electronic Data Processing for Business and Industry.

Grad: Where did you get the term electronic data processing from?

Canning: From IBM.

Grad: Was that the term that they had been using?

Canning: Yes, I started out saying electronic data handling machine, but processing sounded much better, so IBM created the term, as far as I know.

Grad: So EDP was sort of the generic.

Canning: EDP was the term.

Grad: When was the first book you wrote, was that 1956?

Canning: Yes, Electronic Data Processing for Business and Industry was published in 1956. Wiley beat on me after that was published as I had agreed to write two books. The second one, Installing EDP Systems, was published in 1957.

Grad: And you wrote those by yourself?

Canning: I wrote those by myself.

Grad: Again, some of these things are starting to pull together: your interest in manufacturing control and in job shop scheduling; your knowledge and interest in computers; your work with simulators; and your ability to write. These seem to pull together in a sense. Are those the kinds of things that drove you to starting your own consulting business or did you just not want to work for anybody else?

Canning: Giving the course at UCLA led to consulting assignments in the Los Angeles area with aircraft companies, North American for one. I don't think I did work for Lockheed, North American stands out mostly in my mind.

Grad: What were you doing, what kind of consulting were you doing?

Consulting and Starting Canning, Sisson

Canning: Well, in the case of North American, you see, this is essentially the area that Mel Salveson's research project, Management Sciences Research Project, MSRP, that's what we were working on. We had mathematicians seeing if they could see the mathematical structure of the problem that was amenable to solution, and I was supposed to be working on to use a computer to attack this problem.

Grad: So you were working with mathematicians as well as with the people who had the problem, the people in the manufacturing shops?

Canning: Yes, and of course to make it realistic, we were as best we could being in contact with job shops around the Los Angeles area that would talk to us. And then, since the UCLA project was supported by the Office of Naval Research, Alameda Naval Air Station said they wanted help from our project, so this was another source of information. Alameda was a job shop for sure but a completely different kind of job shop. They'd bring an aircraft into the facility, tear it down, find out what had to be manufactured or be replaced and then put everything back together again. So that workload was completely unpredictable. You didn't know what was going to be worked on. So, these were the sources of information that we used for attacking the problem.

Grad: So you're saying by having done that course though, that sort of opened your eyes, you got some consulting work and you saw the opportunity then to have a business in that area?

Canning: Roger and I kept in contact. I had left Point Mugu to work at UCLA. I think Roger was working for the contractor that hired him and me. I had had to switch to civil service, but he didn't. He stayed with the Electronics Engineering Company, moved back to Los Angeles and then was I think a little unhappy with the work that they were giving him and went to work for NCR. NCR opened up a division out there to work on computers. I'm sort of vague on this, but I'm pretty sure I'm about right. And we kept in contact and somehow got onto the discussion, "Hey, should we go into business for ourselves?" And there was no consulting firm that I knew of on the west coast that was doing business data processing type of consulting, so we just started up, not knowing what we were getting into.

Grad: Did you need much money to start the company?

Canning: No, we just tightened our belts. That first year was pretty severe. I mean, we were having our problems, but, you know, we survived.

Grad: So 1954 is when you actually started.

Canning: The fall of 1954.

Grad: Now, relatively soon though, within a year or so, you start to have a significant number of high level clients?

Associated Merchandising Project

Canning: Yes, and I don't remember what got us the Associated Merchandising job, but that's the Higbee job that you were talking about, the department store in Cleveland. The Associated Merchandising Corporation was a buying organization for non-competitive department stores. That is, in a city only one store or chain of stores could be a part of AMC. And they thought they were interested in computers. And the stores had decided to get into a joint project; they'd each contributed money and in some cases personnel, and they picked Higbee's as the guinea pig, Higbee's was willing, and they picked RCA as the supplier of the computer. One of the important areas that they were after was how to improve the sales and the profitability of fashion merchandise. You get all these different new fashions in and you're not sure which ones are going to sell, and the earliest indication you can get that here's the one that women desire most, you can get your reorders in for that ahead of the competition, and that was a significant thing. So RCA built a transaction recorder. The one I remember was in the men's furnishings, but there must've been something in women's furnishings too.

Grad: You speak of the transaction recorder. What do you mean by that?

Canning: When I as a customer would walk in and suppose I wanted a pair of gloves, and I'd search around and maybe the salesperson was helping and then finally I got a pair of gloves that I liked, I'm going to buy them, and in the past, you know, they write out in sloppy writing a sales slip, and ring it up on the cash register, and the sale is consummated. And if it's a charge sale, then a copy of that sales slip has got to go upstairs into the files and I'll get billed for that at the end of the month.

Grad: They used pneumatic tubes to move those things around?

Canning: Well, they sometimes used pneumatic tubes. But the identification of that particular pair of gloves, the style, the color, the size, all of that was lost. There was no recording of that. It was just one pair of gloves, whatever the price. With the transaction recorder, they could identify each of the items sold. I think this was done with the help of the manufacturer who would put on it a code that would identify style, color, size.

Grad: Is that like an SKU number would be in the manufacturing area, similar to that?

Canning: Yes, that type of thing. So that there was a little ticket that was attached to the item; they would put the little ticket in the recorder. I've forgotten the details of this.

Grad: My memory is that it was a Dennison tag. Is that the right name in that time period?

Canning: Well, Dennison was a big tag manufacturer. As I say, this was 50 years ago, so it's hazy. I would have to say that the goal of the transaction recorder was to take things right down to the stock keeping unit, SKU. Style, color, size level was a level more than systems were able to handle in those days. What they wanted to do was not only detect what new trends in what was selling in fashion merchandise, but also for all the merchandise they sell, and on credit charges, they wanted to get away from sending back copies of the sales slip to the customer along with the bill. They just wanted to have descriptive billing. And in those days all they could say was, "You spent 50 dollars in men's furnishings" and if I don't remember what I bought, I might say, “I surely didn't buy something for 50 dollars.” But if they could say, "You bought a pair of gloves in men's furnishings," that I would remember.

Grad: So this became what's been called a point of sale recording project? And there was some specialized hardware that RCA constructed to do this?

Canning: Yes.

Grad: What was the software content of that? Were you involved in that part of it?

Canning: No, I was not. We got in at the tail end really. When they had put these systems on the computer at Higbees, they went out to most of the computer manufacturers, IBM, Univac, RCA, on down the line, I think even Control Data, to get bids of what the manufacturers were proposing for a department store of 500,000 charge customers and so many billing cycles per month, I think it was 20. In other words, they set up what they considered a unit store and the manufacturers were to bid what equipment they thought would handle it. What Roger and I were hired to do was to audit their proposals.

Grad: So you were not actually involved in the design process?

Canning: No. Not at that stage.

Grad: Did that come later?.

Canning: Later on. What we said was, "Hey, you know, the manufacturers in their proposals haven't allowed for any time on the computer for debugging programs, for maintaining programs, for developing new programs, for reruns." So we got statistics from other data processing installations, roughly how much time on the computer that's going to have to be allowed for these different things, and how many programmers are you likely to need and how big are these programs likely to be? Now they did have some information. They already had programmed sales analysis, billing and inventory control, things like that, so we audited the proposals and it just knocked the daylights out of the economics of the computers. A good number of the department store executives from around the country got together after January, in February or March. As I remember their fiscal year closes January 31st, so it was after that. And the results were presented about what were the economics of computers and some of the department store executives were furious. They'd put all this money into this big project and it was no panacea. What they wanted to do was cut cost and detect fashion trends, those were the two big things.

Grad: I'm assuming it would've helped significantly on the fashion trends, the early discovery of hot items. Is that correct?

Canning: I don’t think that it is a correct statement. I'm not sure that it ever showed up as a great detector of fashion trends that could compete with the woman buyer walking through the department and saying, "Hey, you don't have any of that today." "Well, we sold them." Boom, she's on the telephone and she is ordering some more. That was awfully fast.

Grad: So you weren't able to say that there was a great additional value from this early detection scheme? That wasn't enough to overcome the economic deficiency?

Canning: My recollection is that the transaction recorder just for inventory control would be great for staple goods, for things you should never be out of, and yet they are frequently out of something. I remember one case where the wife of one of the vice presidents came into the downtown store and she wanted something that they should always have, but they didn't have it. So she said, "Well, that's no matter, I'll stop in at such and such a branch on my way home." As soon as she left, the woman there in the department got on the phone and called the same department out in that branch and said, "Have you got such and such, because Mrs. so and so is coming." But they didn't have it either. So, they went out to a competitor and bought it and brought it back to the store and held it there until she got there and they could give it to her.

Grad: That's a wonderful story. We may follow up on some of these areas later on. Let me just pick up one or two more items. Were there any other major consulting projects you did during the 1950s or early 1960s, work with GE, work with B&O, some of those?

Other Consulting Projects

Canning: Well, I was thinking of Ryan Aeronautical in San Diego as an example, and I've used this same approach at several places, at Capital Research in Los Angeles, which is a mutual fund group, American Funds, for example. At Ryan, they wanted to improve their data processing and finally one of the vice presidents was very much behind this, and working with the data processing manager, we decided that the best way to handle this was to have an a one week off site meeting of several key department managers, to determine what direction they wanted to go in doing their data processing. And this was a job shop manufacturing control example with all the features, engineering and inspection and quality control and all the rest of it, and I remember that the managers, their first reaction was, "I can't be gone for a week." It meant going to a downtown hotel a couple of miles away and taking a room there, a conference room, and spending most of the workday down there. Oh, they hated it. But the interesting thing was that by about the third day, I won't say fights were breaking out, but managers were significantly disagreeing about whose fault such and such was. It was becoming clear that there were problems that they now could all see and focus on and I won't say we got everything mapped out by the end of the week but we got quite a bit accomplished, that yes, this is the direction to go. And most of them thought that it would require new computers, but the economics of the present business situation wouldn't support that. The interesting part of it to me was that once this road map had been laid out, from then on the data processing people, the programmers, they knew what was wanted, so when they were working on maintenance, they used these ideas. They actually got about I think they told me something like 80 percent of the benefit of what we had mapped out just from the maintenance that they were having to perform on the existing programs. I thought that was pretty interesting.

Grad: I see, so that was sort of an incremental approach as against a throw out everything and build a new one kind of thing?

Canning: Yes. There was just no way that management was going to authorize a big project but the maintenance had to be done anyway.

Grad: Is that a principle that you think applied later on or should've applied later on, this more incremental rather than the break the mold kind of approach?

Canning: My inclination is yes. I did this at Capital Research and at some others also.

Grad: But I think the EDP Analyzers, when you were writing them, recommended evolutionary types of change rather than recommending revolutionary approaches. You were very much a person suggesting a step by step approach rather than a throw out the baby and we'll start all over again?

Canning: Yes, yes. Jack Jones of Southern Railway was a very successful manager, and that was his approach. And he delivered everything he promised. He didn't believe in this big project overdo everything. It was step by step. He had a goal out here and he would work toward that goal, but it was on a step by step basis.

Grad: To my mind, that's a very significant principle, and I think a lot of what you did in your books and what you wrote was saying, "You don’t need to throw out everything and start all over again, but you can work your way toward your goals on a step by step basis."

EDP Analyzer

Canning: Yes. I guess I should make a comment about the EDP Analyzer. What I had found out was that when we wanted some writing help on certain issues, if I used somebody who was primarily a technologist, I just couldn't use the material. The description of the technology was great, super, but there was no idea of how it was going to help the business. And I feel that was perhaps why the Analyzer closed down because I didn't detect that usage focus in the Analyzer after we sold it, and after Barbara was no longer the editor. And I think that might've been the problem, but I never did write to the new owners about that; it was not my business to tell them that.

Grad: How many years did you do the Analyzer?

Canning: Twenty-three years, and Barbara did it for three more years.

Grad: Very much practical stuff. You worked very hard though on collecting information that you were going to use in future issues.

Canning: Yes. I always had folders that I'd put together on what I'd collected.

Grad: Where did the ideas come from on what you wanted to cover in the Analyzer?

Canning: Oh, that's a great question. I remember one of the writers of Computerworld asked me that, and I had a hard time answering. He thought I was holding back on him, and he got mad. I told him (I think Ron was his name), "You know, I've never thought about this question." Barbara and I were constantly out in the field; we'd go to conferences, we'd visit companies and somehow, by osmosis, I guess, Barbara and I'd get together and try to identify subjects that probably were of interest. Then if one of them appealed to me for my next job, that's what I would work on.

Grad: How old was Barbara when she first got involved with you?

Canning: Let's see. She was working for Rand Corporation. She had graduated from college.

Grad: So it's got to be late 1960s, maybe?

Canning: Yes. She must have graduated around 1968.

Grad: So you started the Analyzer in 1963 and you did it for some years by yourself?

Canning: Yes. And then the first things that Barbara did, we had an arrangement with a magazine in Paris, sort of like the Analyzer, a little bit anyway, and what Barbara started out doing was she would take several Analyzers on a general subject and pull from them and create a new report, and we would provide that to this magazine in Paris and then that sort of led to her creating new issues.

Grad: And she eventually became a real partner with you as far as creation of issues and started writing some.

Canning: Yes, near the end there in the early 1980s she was writing, I'm not sure if it was half the issues, but a significant number.

Data Processing Digest

Grad: Just to summarize, it seems to me that in your career, the work with education and with the seminars that you developed helped to build your consulting practice, and then you turned around and from the knowledge you gained in the consulting practice, you wrote your

books and you did the Analyzer. How about the work that was done on the Data Processing Digest? That was a different sort of thing, keeping up with the industry.

Canning: That was Roger Sisson's idea.

Grad: Oh, that was Roger?

Canning: It was his idea. He said, you know, "We're having a hard time keeping up with the literature; let's create something that reviews the literature."

Grad: That was basically picking up what other people had written?

Canning: Yes, and Margaret Milligan was the editor.

Grad: She just donated a complete set of Data Processing Digest to the Charles Babbage Institute.

Canning: Good, great.

Grad: But the Analyzer was much more educational. It was teaching people, telling people how to do things.

EDP Analyzer (Continued)

Canning: Well, the first EDP Analyzer was a Canning, Sisson promotion sheet. Over the years, the issue that raised the biggest storm was called the "RAM Myth." This was in the early days of random access disk memory, and it wasn't being used all that effectively, so we pointed out some of the difficulties of using it. We were trying to interest readers in our consulting services by pointing out problems and pitfalls when using new technology.

Later when I was a consultant, I thoroughly enjoyed my consulting work, walking into a client and not knowing what they're going to throw at me; but on my eastern consulting jobs, I developed very bad insomnia and I knew, even with multiple sleeping pills, it wasn't working, so I had to find a solution.

Then in early September 1962 -- I remember it was September 9th, but maybe that's not the date -- but anyway it was very close to that, I got this idea for the Analyzer.

Grad: Did that end up becoming your primary income source for the next 20 some years?

Canning: Yes. Let's see, I wrote the direct mail advertising for it because I'd done some of this for the Data Processing Digest. It was mailed out, and I used all the money we had, $4,000, to send out some thousands of direct mail pieces the first of November. Christmas came along and the number of people who said yes they would like an issue and if they liked it they would pay us, and if they didn't like it they wouldn't, almost came up to the Go point that I had set. So finally I just said, "Oh, the heck with it, let's go, let's do it," and so the first issue came out in February of 1963, and it worked.

Grad: It was then monthly after that for 23 years?

Canning: It was monthly after that.

Grad: We're going to draw this to a close. There are a number of other areas I'd like to explore and we'll try and set up to do this by phone with you later on. And we can tape the continuation and then get it transcribed. Thank you very much, Dick. It's been a pleasure.

References

Richard Canning has had two previous oral histories and copies of them can be obtained from the organizations which conducted them:

Smithsonian Computer History Project: Robina Mapstone interviewed Richard G. Canning on August 10, 1973. A hard copy of this interview can be obtained by contacting the Smithsonian National Museum of American History.

Charles Babbage Institute: Jeffrey Yost interviewed Richard Canning on August 23, 2002. The transcript of this interview is posted at www.cbi.umn.edu.

Additional Questions and Answers [based on questions submitted and answered in writing]

Grad: Would you describe any experiences you had with John Haanstra?

Canning: As I mentioned earlier, when we moved from Poughkeepsie, New York (where I worked at IBM) to California, I worked at the Naval Air Missile Test Center, Point Mugu, in the Range Instrumentation Department. We were expecting a new, big computer that Raytheon was building, that would do missile flight data reduction (correcting for the known instrument non-linearities). While waiting, and not knowing when the computer would arrive, Navy management authorized us to build a fairly simple analog data reduction system.

About this time, our department received a letter from an electrical engineering professor at University of California, Berkeley. He said that a John Haanstra, who had received a masters degree in electrical engineering (computers) the previous June, and who was then working at IBM Poughkeepsie, was being recalled into the Navy as an enlisted sailor – and perhaps we would like to get him assigned to Point Mugu. We did indeed. The request was submitted and fairly soon John showed up.

It soon became apparent that John was an excellent electronics engineer, perhaps the best on the base. He played an important role in the design and development of the analog data reduction system. I remember one event. He had been designing an analog circuit, and set up some performance equations that he thought would solve a problem. He developed a proof for the equations. "That is the first time I have ever proved a theorem," he told me proudly.

John was so good an engineer that the Navy officers of the department suggested that he apply for a commission, which they would whole-heartedly support. But John declined. He wanted to get out of the Navy as soon as possible, and felt that if he were commissioned, that would hold him in the service longer. I believe he had been recalled for one year of service.

I should mention that all of us working on the analog data reduction system were fairly close, and had family social events together. John was married and had a baby son, so we knew his wife fairly well.

As the end of his service term approached, John started looking for a west coast job; he didn't want to go back east. He had just about decided to go to work for Hughes Aircraft Company (a misnomer, the appropriate name would have been Hughes Electronics Company) when it was announced that IBM was opening a new engineering laboratory in San Jose. That suited John just fine. So as soon as he was discharged from the Navy, he joined IBM in San Jose.

I kept in touch with John when he was at IBM and I was at UCLA. On a trip to the Bay Area, I phoned him and he invited me to the lab and later to his home, for dinner. At the lab, I found that he was working on the RAMAC, IBM's first random access machine. As I remember, it had a physically large disk storage, but it was the earliest days of disk storage so the data capacity was not great.

One other contact that I remember, several years later, was when he was a fairly high executive at IBM Poughkeepsie and I was a consultant (with Roger Sisson). I had just returned from a trip to Japan and thought he might be interested in what I had observed about computer printing technology there, so we had a chat on that subject.

My final contact with him was in connection with an AFIPS project, at which time was he working as the executive in charge of the GE computer manufacturing department in Phoenix. We were attempting to assemble a number of computer executives for a several-day workshop, and John was one of the desired executives. I had contacted him, but he was about to leave on a trip east and didn't want to make a decision until he returned. So I called him on the day he was expected back. I could tell that his secretary was crying, but could get no information except that John wasn't there. It turned out that for the trip east, he had flown his own light plane (which he had GE's permission to do), with this wife and son as passengers. On the trip home, he had encountered turbulence from a hurricane hundreds of miles away, but it was enough to cause the plane to crash. All three of them were killed.

Grad: Who were the primary audiences for your EDP seminars and what was the principal content?

Canning: The content of the seminars was the same as the content of my first book – *Electronic Data Processing for Business and Industry.* In brief, the message of the book was how to perform a system study in order to develop the requirement for the new system, and then the design of the new system to meet those requirements. My second book, *Installing Electronic Data Processing Systems,* picked up where the first one ended and covered some of the details of installing a new computer system (but for some long-forgotten reason I never gave a seminar on that subject). These books were written in the mid-1950s, so the whole subject area was brand new. I drew on my consulting experiences to a great degree, but without discussing specific client experiences, of course.

The seminars were five days in length, Monday through Friday, 9 to 4:30, at a nice hotel – for example, the Biltmore in New York City.

The attendees were normally company executives who would oversee the computer project. Sometimes the attendee would be a vice president, but often it was someone who reported to a vice president.

I think I have mentioned this previously, but it is worth repeating. I never tried to sell Roger's and my consulting services at these seminars. Instead, if asked, I would discuss what the services of the major consulting firms and accounting firms were like, in my opinion – what I saw as the strengths of each. And generally, in the course of the week, I would be invited to have a drink with someone in the late afternoon, and was further invited to stop by the company in the near future to see what I could do for them.

It is also worth mentioning that sometime in the 1970s (I forget the dates), I was made chairman of the ACM Professional Development Committee. This committee put on computer-oriented seminars around the U.S. I was made chairman just when it was revealed that the seminars had just finished losing a lot of money for ACM. So we picked some good subjects, sought qualified people and/or companies to present then, and signed up presenters. I always told the presenters not to try to sell their equipment or services, if they expected to get any business from the seminars. I always attended the initial dry run for each seminar, and again stressed this suggestion. Usually my suggestion was ignored, and as far as I could determine later, none of the presenters that did sales pitches got any business from the seminars.

But from the ACM standpoint, the seminars were successful. We ended the "money losing" days and entered the "money gaining" days from the seminars. Eventually, the ACM Council decided to tap our earnings for supporting other "more worthwhile" ACM activities (per one Council member).

Grad: Please discuss the Wiley Series on Business Data :Processing for which you were the editor. What were some of the books that were published and what was the purpose of the series?

Canning: Dan Couger and I were co-editors of the series. We suggested to the Wiley acquisitions editor (Gerry Galbo) subjects that we thought would sell, and Gerry did the searching for authors.

When authors were found and had submitted manuscripts, Dan and I would review them, and would also suggest the names of other reviewers. We would then review those reviews. Gad, what an experience. So often, the reviewer just wanted to show how much smarter he was than the author, and the review was almost worthless. Finding a good, objective reviewer was difficult. One person that I could always depend on for an excellent, objective review was Willis Ware of the Rand Corporation in Santa Monica.

Our series covered a wide range of hardware, software, and system subjects. To my great surprise, I think the one book that has continued to have reasonable sales over the years was on the subject of software maintenance.

Grad: Can you talk some more about what your activities were in relation to Codasyl, ACM, AFIPS and IFIPS? What specific roles did you play and what were some of the accomplishments and frustrations in Professional Societies?

Canning: I became active in ACM (Association for Computing Machinery, mostly professors and programmer members) in the 1960s when Tony Oettinger was ACM President. ACM had a special interest group (SIG) on business data processing (BDP – hence, SIGBDP) that was in trouble. The bylaws required that a new chairman be elected. The current chairman was at his wits end; he would send out ballots and practically no one would send back a filled-in ballot. No valid election occurred. Tony asked me if I could help.

The problem was that many of the members of this SIG worked in companies, and they could care less about the running of the SIG. They just wanted the literature and conference sessions on subjects of interest to them. And as far as the literature and conference sessions were concerned, their companies in general didn't want them to write articles for publication or give presentations "that might tip our hand." Any academic members, of course, were delighted to have their articles published and to be conference speakers.

So we appealed to the ACM Council, to change the bylaws to say that some SIGs could <u>appoint</u> their chairmen. That was done, a new chairman was appointed, and SIGBDP was on its way. One of the things accomplished was creating an attractive, useful publication, *Data Base.* B. L. Trippett, of NCR, was very active in SIGBDP, and he had his graphics people at NCR design a cover that has proved to be eye-catching – and is still in use.

I think our most impressive appointed chairman of SIGBDP was George Glaser. He not only helped SIGBDP improve its performance but also went on to larger roles in ACM and AFIPS.

Originally, I hoped that people from companies would write articles and give conference presentations. Some companies did support this, such as IBM. But, as mentioned, most companies did not. So by the 1980s, the university people had taken control of SIGBDP and *Data Base*, switched back to an elected chairman, and changed the name to SIGMIS (Management Information Systems), as was their prerogative. After all, they had the interest and the support of their employers in this activity. But I was always sorry that we could not generate interest in participating among the business community.

My SIGBDP activity, late in the 1960s, got me nominated to run for president of ACM. I had no illusions that business data processing was that important in ACM, or that I would be elected (in fact, I hoped I wouldn't win the election). The reason that I accepted the nomination was that I knew the runner-up in the presidential election would automatically become the ACM representative to the AFIPS Board (American Federation of Information Processing Societies – an association of societies, not of individual members) and <u>that</u> position I did want. The reason

I wanted this was to do what I could to obtain more and better sessions on data processing at the big AFIPS Spring and Fall Computer Conferences.

Fortunately, I was not elected ACM President (Bernie Galler was); I became the ACM representative to AFIPS for a year, and then was the AFIPS Secretary for a year. In my AFIPS activities, we sponsored a number of workshops (like the one mentioned above in connection with John Haanstra) and presentations. I remember one presentation I participated in. Several of us gave briefings to the Federal Communication Commission, to help the commissioners in a subject area they would be dealing with shortly

The AFIPS activity, in turn, led to an IFIP activity (International Federation of Information Processing). IFIP had an active special interest group on Automated Data Processing, with headquarters in Amsterdam, The Netherlands. I was asked to be the AFIPS representative to IFIP ADP. That meant two or three trips a year to Western Europe. I was glad for those trips, because I could also do work for EDP Analyzer, and share trip costs with AFIPS. This IFIP activity was mainly concerned with putting on seminars on computer subjects (in English), in various cities in Western Europe. I think my previous experiences with computer-related seminars was helpful, but we didn't put the world on fire. I know that I didn't understand the market in Europe as well as I thought I understood the U.S. market. But I did enjoy the activity and meeting and working with the representatives from the European societies. And the after-hours social activities!! I remember a dinner at Hamlet's Castle in The Netherlands, sooo different from the formal dinners in the U.S., and so nice.

Grad: Did you produce any other publications?

Canning: In 1979, our daughter Nancy expressed an interest in coming to work for Canning Publications, Inc. (publisher of EDP Analyzer). Her interests clearly were more in tune with small business than with large organizations, which EDP Analyzer was covering. So we decided to start a new newsletter aimed at small business, *Computing in Your Business*.

Actually, I think it was a good newsletter. It gave case studies of what a variety of small businesses were doing with computers. It sought to show readers multiple uses for their computers. But halfway through the second year of publication, we surveyed our subscribers about their interest in renewing. Result: Little interest.

Reason for that little interest: Most of the small business owners, who were the subscribers, had installed a computer to solve one problem they had. That problem might be inventory, or billing, or some other paperwork problem. Once that problem was solved, they had little interest in finding other things that the computer could do for them. Hence no interest in what we were attempting to point out to them.

So we ceased publication at the end of the second year, and gave subscribers their choice of money back for the unexpired portion of their subscription, or a book we would publish. Some took their money and some the book. So Nancy and I authored a book, *So You Are Thinking of a Small Business Computer.* It wasn't a best seller, but it did make a profit for us.

Grad: Looking back on your lengthy career in the computer industry, what do you view as the most significant things that you were able to do and what do you feel were the most important changes over the years in the evolution of the industry?

Canning: Being asked to discuss what were the most significant things that I was able to do in my career is a very difficult question for a writer. Unlike someone such as Charlie Bachman, who could boast of Integrated Data Store, a successful data management system for disk storage, all I can point to are 23 years of EDP Analyzer, some books, and memories of seminars and professional society activities.

I know what I hope I accomplished, and that is, making the development and installation of new computer systems in large organizations go more smoothly and less painfully. That is what I was trying to do, with the Analyzer. Did I succeed? Who knows. I hope it did.

Every once in awhile, when I meet someone new, that person might say, "Are you the Dick Canning of EDP Analyzer?" When I answer, "Yes," they might say something like, "I looked forward to your issues. I learned a lot from them." As Victor Borge used to say at the end of one of his concert sessions, "That (laughter) was my reward. All the rest went to the government."

In ACM publications and conferences, management uses of computers have become more respected – not perhaps as much as computer science, but respected.

What has <u>not</u> changed? I still detect that technology people, when dealing with the management uses of computers, dwell on the power of the technology, with insufficient concern for what that technology can actually do to solve management's problems. I still detect staple items "out of stock" in local branches of drug and grocery stores, items that really should never be out of stock. It happens far too often.

Another area: application system development and programming. Yes, the technology has changed – but in a broader sense, the process has not changed. Even with the latest technology, I gather that the development of large computer-based systems is just as painful as it ever was. Of course, leased software systems and packages are in much more common use today than in the mid-1980s, so the development process has been off-loaded to supplier companies.

In one area, though, I can look back with personal satisfaction. EDP Analyzer provided me with an occupation I loved, all 23 years of it. I told our four children that working in a congenial job was extremely important in life, and not to put up with a job they hated. Fortunately, that has worked out for all of them.

That, too, is something that hasn't changed.

Summary Outline of Work Experience [prepared by Richard Canning]

1. Pre-Canning, Sisson

    a. Naval Air Missile Test Center, Point Mugu, 1950-52. Both Roger and I were hired by Electronic Engineering Co. (EECo), contractor to U.S. Navy, to work on Raytheon computer (under construction), to be used for data reduction and for real-time missile flight control. While awaiting the computer, we worked on data reduction system, Project Breeze. I switched to Navy employment; Roger stayed with EECo.

    b. UCLA. I went there in 1952, to work on what was eventually called the Management Sciences Research Project. Worked with Mel Salveson, Al Rowe, and others. My efforts included early work on simulation, on the SWAC. Roger left EECo to join NCR. After we created Canning, Sisson, he joined the UCLA project on a limited time basis.

    c. I kept working at the MSRP after Roger and I were in partnership, on a limited time basis. I was asked to find a location for a big computer that IBM wanted to give UCLA. Worked with Dick Hill on a recommendation that eventually ended up as the Western Data Processing Center on UCLA campus.

2. Seminars on EDP

    a. Developed and presented a one-semester UCLA Extension course, EDP for Business and Industry.

    b. This course, attended by DP people in LA area, resulted in some consulting assignments for me.

    c. University of Chicago, Business School asked me to present my EDP course as a 5-day course, at a high (to me) tuition price. Well attended. I learned that the course could ask and get a $200 price.

    d. I think I gave it once in NYC before Roger and I formed Canning, Sisson

3. Formation of Canning, Sisson

    a. I was at UCLA, Roger at NCR in LA area. We kept in touch – and began talking about forming a consulting company. We did so in the fall of 1954.

    b. Some clients: AMC (Higbee's, Lazarus, Bullocks, etc, mostly my clients), GE (both of us), B&O Railroad (Roger did this), JP Stevens (my client)

    c. Roger and I gave 1-week seminars in NYC, Chicago -- $200 tuition. Good source of consulting assignments – if we didn't try to sell our services in the seminars.

    d. When I presented the seminar (and Roger was doing consulting elsewhere), I would get a guest speaker for one afternoon. That is how I met Grace Hopper, and kept in touch with her for years. I think she was the one who got me invited to the first meeting in Washington that started the COBOL language project.

e. We teamed up with Felix Kaufman for some NYC seminars, so the two of us didn't have to travel east.

f. In 1958, we decided to go our own ways – Roger to a division of Ford Motor Co in Newport Beach, and later to Philadelphia, and I became an individual consultant and moved to Vista, CA. Initially, we kept Canning, Sisson's name for publishing DP Digest, and then in 1960 we sold it to Margaret Milligan.

4. Writing and publishing activities

   a. Data Processing Digest, 1955 – Roger's idea; he suggested Margaret Milligan as editor. We hired her. She did all the writing, Roger and I reviewed and made suggestions.

   b. EDP Analyzer, was a 1 sheet (2 page) letter to promote our consulting services

   c. Idea Finder was a thick compendium of DPD articles

   d. Later (1962), after we had sold DP Digest to Margaret and dissolved Canning, Sisson, I had idea for a newsletter, and got permission from Margaret to use EDP Analyzer name.

5. Professional activities

   a. ACM – initially became active in the Special Interest Group on Business Data Processing. Got George Glaser interested in being chairman of group, and he and I stayed in contact for years. In 1968, I was nominated to run for president of ACM. I didn't really expect to win election, but the runner-up would be the ACM representative to AFIPS, and that was the job I wanted. My goal was to get more coverage of data processing in the AFIPS computer conferences.

   b. ACM Professional Development Committee. I was named chairman of the committee, and almost immediately was told, "Your seminars have just lost a lot of money. What are you going to do about it?" We did get them back to profitability. Interesting brief story.

   c. Around 1963 or 1964, when I was publishing EDP Analyzer, I took the DPMA CDP exam, as something of interest to DP management. Passed it, and wrote it up in the Analyzer. Then I was invited to be on the Certification Council (I think this was its name).

   d. I was Secretary of AFIPS for a period. Was named as AFIPS representative to IFIP ADP group, with HQ in Amsterdam. Required several trips a year to Western Europe. Could do EDP Analyzer work on the trips so could split airline expenses with AFIPS.