

An Interview with
SUSAN H. NYCUM
OH 432

Conducted by Jeffrey R. Yost
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Susan H. Nycum Interview

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Abstract

This interview focuses on law and the criminal justice side of computer security. Nycum discusses law school, her work managing and helping to manage major academic computer centers (at Carnegie Mellon and Stanford), her roles with various pioneering IT-related and law groups/associations (including ABA Science and Technology Section, the Computer Law Association, and the ITC Law Association), efforts with the law and computing within ACM, her influential collaborative research with Donn Parker on computer crime and computer criminals (including interviewing prisoners), and her work with law firm Chickering and Gregory.

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Yost: My name is Jeffrey Yost from the University of Minnesota, and I'm here today in Portola Valley, California, at the home of Susan Nycum.

Nycum: "Ick". Nick-um.

Yost: Sorry about that.

Nycum: That's okay.

Yost: To interview her about computer security for CBI's NSF-funded project, "Building an Infrastructure for a Computer Security History." So I'll begin with a few basic biographical questions. Can you tell me when and where you were born?

Nycum: I'll tell you where but not when. That's still something that I keep quiet because of the fact that for many, many years I was far too young to have the responsibility I had, and now I'm far too old. [Laughs.] But it was in Pittsburgh, Pennsylvania.

Yost: And did you grow up in Pittsburgh, as well?

Nycum: Yes I did.

Yost: Who were your greatest influences in childhood and adolescence?

Nycum: My family has been very, very important to me. And as I think about it, I think it's because of that gene pool that I was most influenced to do what I have been doing. My grandmother on my father's side was college educated as a chemical engineer in the 1800s and that was quite unusual. And she had a very great interest in almost anything you could think about. That's on my grandmother's side. On my grandfather's side, my great uncle is Edwin Hubble who has the telescope named for him had a tremendous interest in thinking outside the box. My father, Dean Hubble, had hundreds of patents and his tutelage was extremely important to me because he would say things like, I don't care how everybody else did, you have to do the best that you can. About his colleagues, the most negative thing that he would say is that Joe Blow hadn't had an original thought in 30 years. So it was important that one, again, think and not just do what everybody else was doing. So those, basically, were the people who influenced me except for a wonderful woman who was my eighth grade teacher. She had a one-room school and in that one-room school in Pittsburgh, by virtue of geography, we had people who were Mellons (Mellon Institute, Mellon National Bank, etc.), and then we had people who didn't have running water because we were near a mining company town. And those people had come from all parts of Europe, but basically from Eastern Europe. And then there were a high number of people who were, we call them now African-Americans. She was very, very demanding of us but she was also very, very much of a supporter of each person to do the best that he or she could and if you were gifted, you had no slack cut. You had to do extra assignments. And if you were struggling you got a lot of help. So it was wonderful. The only down side was she gave me an "F" in conduct once because I had, quote, 'wasted other peoples' time as well as my own.' So the roof descended on me

at home when I took that home. But it was such a wonderful learning experience and I would say those are my key influences.

Yost: Were there particular subjects in primary and secondary school that you especially enjoyed or had a special aptitude for?

Nycum: I just loved everything. But the problem was that I learned it a little too fast for the class and so spent half my time standing in the hall or in detention. Until finally they moved me a whole class grade ahead, at which time I became a little more respectful of the fact that I was a whole year behind the other people. But I loved it all, except plane geometry.

Yost: You attended college at Ohio Wesleyan?

Nycum: Yes.

Yost: Did you know what you wanted to study when you arrived there and what ultimately did you come to major in?

[BREAK]

Yost: So, Susan, you were talking about Ohio Wesleyan and what you focused your education on.

Nycum: I assumed that being female at that time that I would study something in the liberal arts. It was expected and that seemed to be the right thing to do. So I expected that I would study English literature or be an English major. And I found instead that I was drawn to political science. I also was drawn to languages because in my prep school we had language training. And then I was drawn to the fact that we had one of the best programs in speech. So I got three majors: political science, French, and speech. But the people who graduated didn't get paid much in those areas. One of my friends who hadn't done as well academically got paid much, much more by going to IBM as a person who'd majored in math.

Yost: As you were in school and finishing up your undergraduate degree, what were you thinking of in terms of a career?

Nycum: Oh, you also know or have heard that ladies of that time, their career was to marry and have children. And they could be nurses or teachers or secretaries until they married and had children.

Yost: And when you graduated, what came next for you?

Nycum: I haven't said anything about my mother, but my mother was always the practical brain in the household. And she said you can't do anything with that degree and you don't have a husband, so I will enroll you in — it was like Katie Gibbs, only it was in Pittsburgh, where you learned to be a secretary. So that's what I did. I stayed at home and

I took the course to be a secretary, which consisted of basically typing and shorthand. I met, there, another person who was fortunate as I to have a reasonable mind and we finished the course I think in 25 percent of the time that had been allocated. And then we got jobs.

Yost: And was that in Pittsburgh?

Nycum: It was. It was for an engineering company, a German engineering company. That was the time I realized that it wasn't just my family whom I considered marvelous people, but that I liked technical people generally, as long as they were smarter than I.

Yost: How long did you work there?

Nycum: [Laughs.] Well, I met my husband through family friends, and he said he was going to law school. He was a Ph.D. in psychology and he was teaching locally at the university, Duquesne University. And he said you know you could do this too, and have your job. And that might be interesting. It's fine that you enjoy the people that you're with, but your function is a secretarial function and this might not be as good long term. So he and I married after the first year in law school and continued in there. We had our child after the second year of law school. And after she was born, I did not work any longer until she was six years old and in grade school. The funny thing was after I graduated and was admitted to the bar, my boss at the engineering company offered me

my job back, which was very sweet of him. He'd held it all that time because he didn't think that law school was really, you know, a full time effort.

Yost: Can you talk about law school? Did you enjoy the curriculum?

Nycum: Oh, I loved it! I loved it. In college, I had taken everything there was to take. I had been in everything you could join extracurricularly. I'd done very well academically and I was a member of Mortarboard, which was the senior women's honorary. The wonderful thing about law school was that it was all about one subject so you could focus on one thing. That was terrific; thoroughly enjoyed it. I was the only woman in the class and the men were so much fun I realized — the best story I have from there is that the last year, as a senior, we were studying together and they started talking about when their children were born. And the key question was: were you in the delivery room with your wife when your children were born? And they turned to me and said, were you in the delivery room when your [laughter]. That's how much 'one of the boys' I was. It was so neat. And I did very, very well in law school and I attribute most of it to the fact that they were so scared that I'd give birth right in class that they were frightened. And it was a cumulative scoring throughout the year, so they all didn't do as well as I because I knew I was not giving birth just then. But it was neat. And everyone was so kind. When we graduated, my daughter was brought to the graduation with one of our good friends who was in practice locally, and the school stood up when I got my diploma. I thought, well, I don't know what's so special about what I had done. But they were very, very kind.

Yost: Were there particular subject areas or courses in law school that you especially enjoyed?

Nycum: This is going to seem totally off the wall for what we're here about, but real property. And, of course, I've spent my life in imaginary property, but at the time, real property. Didn't have any of the subjects in which there's an interest here. It didn't exist. My father said he saw his first computer in 1935 but the rest of the world didn't know that. So the things I liked were fairly traditional like property. Anything that had a mathematical part to it I really liked.

Yost: Did the engineering company that you worked for as a secretary, did they have a mainframe computer?

Nycum: No.

Yost: Were there any courses that related to, maybe not computing, but technology and the law?

Nycum: Oh no. You've hit a really important vein because one of the things that I realized — my father, of course, was at the Mellon Institute for Industrial Research, which was first of all at University of Pittsburgh, then it moved to Carnegie Mellon. All my family was very technical. On the other hand, all my friends and all the law school people were not. By design, I mean. So my father's friends, including my father, thought

that lawyers were sort of a blot on people who did really good things. And my friends in law school thought those people were — we called them nerds. So I felt kind of strange because here I was, on the one hand, a blot; but on the other hand, I loved the people who didn't love the blots and I didn't think they were nerds, I thought they were just exciting. So I began to think of what I knew or could know that would be helpful at this intersection of the two fields.

Yost: And can you tell me what year you got your J.D. or would you rather not say that?

Nycum: Well, it was in the 1960s.

Yost: What was your first exposure to computing?

Nycum: So exciting. Let me think how it worked. I'm a bit of a social person and so I became head of the Allegheny County — which is where Pittsburgh is — Lawyers Wives. And through that, became active. Also I was very active in the Pennsylvania Bar. It's not integrated, in other words, you have a choice to being a member or not. In California, everyone is. And so I was very interested in what was going on and people knew I was interested in this area where I'd just expressed an interest; that was all. I can't remember how this came about. Maybe something as simple as a request to the bar association. At the University of Pittsburgh they had a group called the Health Law Center and they were computerizing with grants and so on, the statutes, that's the legislative materials, from as many states as they could possibly do in the U.S. I thought

this was a wonderful opportunity so I applied. I was not thought to be old enough to be a senior person but I tried. So this was a wonderful experience and I had undergrads working for me, and some graduate students in law working for me. And it's the first time I'd ever learned anything about information retrieval. It was the first time I'd ever heard about the IBM Corporation. And it was absolutely breathtakingly fun. So we were working with the technology of the day, which was most primitive, and we were the forerunners of LexisNexis. That's an ideal way to figure it out, time wise. And I just loved it. The company went public. The Health Law Center became Aspen Systems Corporation and it went public. But after it went public there was a requirement that they become more business oriented. And I got a little note from the president of the company and founder saying, Susan, put your brain in jeweler's box, we have to be selling and making money. So I went off to New York to sell our services, and I did so to some of the very, very outstanding lawyers in the U.S. and the world. They're household names of that vintage and they said, we don't understand a word you're saying. We don't understand why we'd want it. We don't think there's any need for it. And would you please just go away. I realized then that I had to appeal to something in them. Fast forward that thought to working with Donn Parker, because the only thing that would reach people is either fear or greed. They hadn't realized at that time that information retrieval, the lexises and all that form of legal research, was going to: one, be cheaper in the long run for them to use; and two, saved from embarrassment because they'd missed something when their competitor had found it. But anyway, we didn't make many sales. Then there was an ad for someone to come to Carnegie Mellon and work in their computer facility. So I was very lucky and even though I was totally incompetent, I was

interviewed by a lady whose name is Jan Fierst. And Jan Fierst I'll never forget because she had the kindness and the insight to say, you shouldn't work for me, I want you to meet my boss who runs the center, Dave Nickerson. And I'd like you to be my boss, not me be yours. Why? Well, turns out, she knew all the stuff she needed to know, but she didn't any of the stuff that I knew and I needed hers. So we became very much of a team and Carnegie Mellon taught me by learning on the job.

Yost: How many years were you at Carnegie Mellon?

Nycum: Almost a year, but I worked for Newell, Simon, and Perlis. They were not bosses, they were customers. And I ran the people interface, we called it User Services. I know Minnesota had really good ones — we knew who the smart people were in the world. And we had people who weren't interested as much in the interstices of the technology as they were the interaction with the technology and the customer, or of others. And so those people, who were also very, very bright, would come and work with me. They knew more computing than I did, but I had worked a little bit longer and knew more people. So I had gotten more, and more, and more responsibility there. I got an offer from Stanford to come be the assistant director, and I asked Allen Newell what he thought about it. He said well, you know, Susan, you've been here all your life. Why don't you try it out there, that's a little different. He was on the faculty at Carnegie and the Board of Visitors for Stanford Computer Science so thought that it might possibly work out. Dr. Perlis had no projects to offer because he had lots of challenges with space wars and all kinds of stuff like that, that were boring but had to be done. And Dr. Simon

was very busy with things that had no application. Alan Perlis had a sign outside the door that said don't ask me to fix a problem I know nothing about. I thought oh, that's good news. That's one of those bywords. Anyway, so I went to Stanford.

Yost: At Carnegie, what computer system did they have?

Nycum: It was funny. We had 1108 at the time, but did we have some DEC stuff? I don't know if we had anything other than an 1108. Not sure. At University of Pittsburgh, we had a 360. A 1410, which was found to be good for text manipulation, data manipulation. So I had to learn about the 1108. What I was contributing was the fact that they had come with a problem with the supplier, and they said to me, can you figure out what our recourses are? I said well, how did you buy it? Where's your contract? Well, we have a purchase order. Oh? And what did it say? Well, I'll show it to you. It's a purchase order for buying pencils. So it had nothing that would help anybody who had bought a newfangled piece of gear that possibly hadn't been tested, or had problems of any kind at all; no warranties with pencils, and on, and on, and on. Anyway, that was interesting. The outside lawyers for the university were people who were personal friends — they're a very, very large firm that exists today and they have offices around the country — and they didn't know anything at all. So they were saying I guess you're on your own. Some of them were neighbors and friends of mine, so they said nyahh, this is not something that we can help. That showed me that there was a nice opportunity. But it was an 1108, and Stanford didn't have any 1108s.

Yost: Yes. Sperry Rand made a UNIVAC 1108. At Carnegie, was there any facility for time-sharing?

Nycum: Oh no, which was too bad, because we had a library application that would've been wonderful if there would've been time-sharing. But no, there was not. There was some remote computing. There were, I think, four remotes in schools. And it was the first time that I saw a bad thing happen with computers. Somebody stole one of the terminals. But we had an answer back feature, so if the person stole it, it was answering from where it was located. [Laughs.] So we just went out with the proper authorities and knocked on the door and just said, you know, I'd like to have my terminal back. Well, these are big things; you can't hide it the way you can hide something in your pocket. That was the first time I knew that not everybody was behaving properly with computers.

Yost: That was at Carnegie or Stanford?

Nycum: Carnegie. But it was a thing they took so there were no legal problems because it was a piece of solid thing.

Yost: You initially were hired in 1970 at Stanford to be was it second in command of the center?

Nycum: Yes.

Yost: Who was running the center then?

Nycum: One of the men was Rod Fredrickson — a wonderful man and he taught me an awful lot. The reason he hired me instead of the 500 or more other applicants who wanted the job was because I was complementary to his skills rather than replication. And the difficulty was that he was a bit of a person who rubbed people wrong, particularly those who were peer level or higher.. And Rod Fredrickson went from Director at Stanford to down at RAND. I have met some of his people who worked for him and there is a pattern. Rod was below average stature and a little bit shy, and these were all tall ladies. So we got to laughing about — you've heard of Charlie's Angels — well these were Rod's angels. But anyway, he was a very, very bright man and his boss was Ed Feigenbaum. Well, first of all it was Paul Armer. And I guess there was some problem that I knew nothing about, was destructive to his management. At the same time, we were having difficulties with IBM so one of my assignments was to look at the contract and see what we could do, and then, of course, there are all the issues of resolving the problems and the rest of it. And the way that was resolved was IBM gave the university x amount of dollars and supported research in the law school. I think, at the time, one of the law professors there, another marvelous man, before he became head of the Antitrust Division of the US government which, looking back on it you can see the wheels turning there — but he was somehow acquainted with IBM and they figured out a way that they could compensate for something that they had not done. [Laughs.] Yes.

Yost: Can you describe the center when you arrived, the systems in place at Stanford, as well as who were the largest users of the facility at the time?

Nycum: The facility had just shifted before I arrived, from the B5500, which everyone loved, to the next generation in the world, which was going to be an IBM 360/67, which no one knew anything about. Including, it turns out IBM development people. A family member of mine was running the whole program to put time-sharing on the 67 — I didn't know this — while we were trying to put our own oracle on the 67 with just a few people. He had hundreds. Anyway, there was IBM, there were some DEC's. I don't know, PDP-8, PDP-11, and what else? We had Control Data — no, sorry, Control Data was back at Carnegie Mellon but it was fading out of the woods as CDC 1600, would that be right?

Yost: The CDC 1604, is that what you mean?

Nycum: That could've been it, yes. Sorry. But they didn't know what to do with it, any longer, so I asked the president of the university if he minded if it just sort of went away to somebody's good use. He said, please, get it out of here. 1604, you're right, it is. So it ran one of the CMU engineer's train set. The 67, by the way, the IBM 67 went to live at the *New York Times*. It ran the *New York Times* when it was phased out at Stanford. Let's see, do we have any other...[I] wonder if we had an IBM over at Carnegie Mellon and I just don't recall. [There] might've been, because I think we probably had three going at once, which seemed to me to be really foolish. So we probably did have an early IBM but

I don't know. At Stanford we had a 67, we had a 50 over in the medical school, and then we had the one at SLAC, our big one, the big number cruncher.

Yost: How involved were the computer science and electrical engineering faculty at Stanford with the campus computing facility in the early 1970s?

Nycum: Well when I succeeded Rod Fredrickson as head of computing —

Yost: Do you recall when that was?

Nycum: It was earlier than I would've ever expected. It was way early, but I don't remember exactly when. My office was next door to George Forsythe. You have to understand that when I have a chance to be near a brain like George's — a nice, nice human being, and his wife a lovely lady — I mean oh, it was just like candy, right? So yes, they were close to us; they were pals. They were busy doing their own things, like founding Sun Microsystems, and things of that nature so there was plenty going on to keep them occupied. Later on, some of the graduate students had to come have a sit-in, things of that sort, to demonstrate what was important at the time to them. But Rod Fredrickson said that the thing to do was to be lean and mean. Everybody played multiple positions; you didn't have boxes you put people in. That was one of the fights that he had with management because traditional management had a lot of boxes and there were structures, and you sat in your box and you did your box thing. And if you didn't like it you went somewhere else. Well, the kind of people we liked couldn't stand boxes. So I

said, the university has decreed that everyone will wear shoes, so they all came in with shoes and no socks. They took off their socks. And then, what was the other thing. I mean, they found ways to express themselves that allowed the creativity to blossom. And of course, the university, part of the time, was run by people who really didn't understand that. So this was a skunkworks is really what it was, now that I know what a skunkworks is. It was marvelous, it really was. We did things that you couldn't do. And there are a lot of the people who had no training whatsoever. They hadn't gone to college; they were just bright people [pause]

Yost: What was the staff size at the center?

Nycum: Oh, teeny weeny. Probably maybe 13 people, something like that. When I was at Carnegie Mellon, I had 80 people and half of them were falling over each other. By the time we got the computer operators and those people, we were maybe up to as much as 40, with shift operators and stuff. But in terms of the core group, oh, yes.

Yost: I had no idea that Carnegie's operation, their center, was that large at that time.

Nycum: It was bloated, as I would call it, yes. But I remember there was an article announcing to the users of the Stanford center about me coming. Fredrickson wrote it, and he said this lady ran five departments. I was holding five different positions at Carnegie Mellon so he said hey, you've done things you didn't know that you could.

Alright, that's fine. But boy, the people at Stanford were sharp. There were wonderful people at Carnegie but there was also a lot of waste.

Yost: You mentioned Forsythe, are there others that were in computer science that you remember interacting with . . .

Nycum: Of course, Feigenbaum.

Yost: I had the pleasure of interviewing him.

Nycum: Oh, yes. So Ed and I had lunch one day — we often did because we just were pals, you know, and I liked his wife too — and what did he say? He said something about being careful to think about all of the ideas you could and then act on a few. And then Paul Armer said to me that the thing about Fredrickson was that he had so many good ideas that were good, he had to run with one or two of them. But I like the style of Ed and Rod; and Paul's a very, very nice man. He had been at RAND. I don't know if you've talked to Paul or not.

Yost: He was a member of the Charles Babbage Foundation, so I haven't interviewed him, but I've gotten to know him over the years.

Nycum: Well, I was too. I was a trustee. But I usually keep a pretty low profile, so, you know.

Yost: I was attending several of those meetings before the Babbage Foundation evolved to the IT History Society in the early 2000s so those are really the only Babbage Foundation interactions I had.

Nycum: Paul is different from the other types that were running around there at the time. Paul was a humanitarian. I don't know if you've done any these studies of personality types, but he is. At one point he was thinking how are we going to get money? And I said, well call up that guy at IBM who's been so successful and get some money from him. He's broken off from IBM and he's [Ross Perot] just running this EDS and he's got a ton of money. Why don't you call him? And he said no, Susan, I won't, but never stop thinking big. He was a nice fellow. I think there was a little difference between him and the other guys. They were sort of all out of the same mold.

Yost: At Stanford, was there time-sharing when you arrived?

Nycum: We were working on it. We had Wilbur, remember Wilbur? Well, Wilbur was wonderful, and he did some wonderful things that hadn't been done. And then there was Orville, because Wilbur and Orville were brothers, right? Fredrickson named these guys. And then there was Ralph, that was the I/O guy, handler. Never could figure out how he got his name. Then there was Susan, who was the mother of Wilbur and Orville — had nothing to do with me at all. And I remember them explaining to me how time-sharing works. I really didn't know squat. It wasn't our strongest suit, frankly, and I'm not sure

whether it just was not possible to do a good job, in those days, because a family member on the IBM team was having some real difficulties.

Yost: Do you recall if there was any discussion in the first half of the 1970s there with regard to security and privacy in the building of the time-sharing facility?

Nycum: No. That wouldn't be an issue the first — oh, oh, you have to hear about Bill Miller. Of course you know Bill Miller, I mean, anybody who's breathing knows Bill Miller, right? Well, Bill Miller has one of the most creative minds I've met in a long time and he's, what, 87 or 88 now? And he's still shooting out ideas in all sorts of different ways on different things. He was worried about this when I was there so he started a privacy committee at Stanford. Was he provost then or was he something else? He was head of us, and then he got to be vice president of research, and then he got to be provost. Then he went to SRI, then he came back to the business school. So that's how it sort of worked. And one of these times he decided that there was an issue university-wide, not just with us. So he put me on the committee; he put the professor of Constitutional Law at the law school who became dean of the law school later, Paul Brest; and he put on the head of admissions and the head of alumni relations; and all sorts of people. We had something published, that he published, called the "Headless Document" which doesn't have your name but you can find out about the person by searching and [we] found that there are a lot of databases at Stanford that were awful. For example, alumni. Don't call on so and so after 10 o'clock in the morning, he'll be fried by drink. Things like that. Bill was very concerned but the rest of the world was pretty much oblivious.

Yost: You mentioned that IBM had to come through on certain obligations and hedged.

Do you think the exchange there was [pause]

Nycum: It was alleged that they had not followed-through; not done some things. There was no admissions.

Yost: They provided some funds.

Nycum: Yes.

Yost: Those funds were, in part, for research?

Nycum: Well, it was in the law school.

Yost: Was that the origins of you becoming a Law and Computer Fellow at Stanford?

Nycum: Yes.

Yost: How long after you came to Stanford did that happen?

Nycum: When did that happen?

Yost: Yes, and was that concurrent to your ongoing responsibilities with the center?

Nycum: No, sequential. Remember we had at Stanford Computer Center, this was the wonderful time when the students were rioting. And although it has nothing to do with computer abuse, except that it was abusing the computers [laughs], I was thoroughly briefed on what we were supposed to do if they came. I was to call the police immediately and as soon as they came, I was to turn over responsibility to the police. So I was thoroughly briefed, except the police never came, and the students came late. I had been schooled by my father, you know, the captain of the ship. So I went into the computer room when they were coming and a couple of the guys wanted to stay with me and I said, I prefer you not. But no, we can't leave. But other than that, we were alone and no support. The students and others came storming in and I met them at the door with a big smile, and I said, "I think you're here to find out what goes on here." They were so gentle, in comparison with what goes on now with guns and horrible things, but it was pretty spooky then. So I took them on a tour and I showed them all the things that we did, and the rest of it, and they were fascinated. We were all getting along sweet as pie and all of a sudden, in riot gear, come these police who'd been someplace else on campus. And of course, it was just awful, but the "visitors" got out in about two minutes. I said [whispering], "Get out! Now! Take your fight somewhere else, please!" So they did and the only thing that happened to us was that a couple wires were dislodged. But, of course, they were key wires. So then the lawyers got into the act, later. First of all, they had to remove me from the scene of the place because it was too dangerous, which I thought was bullshit. And it was. But anyway, the thing that the lawyers said was, now how was

it that the computer ceased operating? Was that because one of those perpetrators sat on the console? A wire was dislodged. So anyway, it really didn't cause any damage at all. We were lucky.

Yost: So if the authorities in riot gear hadn't come, everyone was fine.

Nycum: Fine! Not only fine, we had new friends. I was so mad. Oh, was I mad! And I was really mad when they said Susan, you may not go back into the center, it isn't safe. Pardon me, where were you . . . ? But those again were days when ladies were protected. But that's a form of computer abuse, beating up on computers, pulling wires.

Yost: When you became a Computer and Law Fellow, what were your initial plans for research and what was the first research that you did?

Nycum: I thought that what I was going to really want to do was do the work that had been interrupted at Carnegie Mellon. Take on what I had done at University of Pittsburgh and move it forward, because we did have Jacques Vallée, who you may know, was working on information retrieval. He's a good friend today; he's a VC out here. So I thought I might work with that. And I might work with the interface for lawyers so that they could handle it better because I remembered that my staff — I don't think I fired the guys, but it was pretty close when the dean of the law school came over and had trouble working the card reader, and they laughed at him. Hee, hee; you can imagine. You never do that. Ever embarrass anyone. So I thought I'd make it easier for the lawyers but that

was not very productive. It turned out that two things were very productive. One was working on the protection of software, which was a different issue from ours; intellectual protection of software, which is brand new. And the computer security thing with Donn. And that, the interest came when there was an attempt to clobber our Volume Table of Contents on the 369.67 and it failed because the shift operators were alert. It was a remote from one of the offsite colleges. And then that's when I called up the telephone company and said I had the following thing happen, now, what would be my recourse? What laws have been broken? And they said the only one we know that could be used was the obscene or harassing telephone call. Oh, my goodness! So Donn and I got together. We were motivated, probably from different directions, but he came to my office. I'm very, very fond of him and we worked well together

Yost: And so that was at the start of your research connection?

Nycum: Yes. When I was over in the law school, I had time to focus on that because I could drain the swamps rather than fight the alligators of the viruses that were constantly burning at the center and that were no longer my job.

Yost: Can you talk about the beginnings of the research that you did with Donn and who were the funders of that?

Nycum: As I recall, it was NSF. It was very hard to get people to understand what we were talking about, but ACM understood. NSF really, really understood. And some of the

people who had been graduate students at Carnegie Mellon when I was there, were over at NSF which is helpful because they could understand that there was a sort of a nexus of the two, because I had been visible about it and they probably worried about some of the same questions. Yes the National Science Foundation. You can't imagine — maybe you can — but people just couldn't understand what we were talking about. And later, the U.S. government, there were legislators who didn't get it. I've been a Republican for generations, but the person who got it the best is Joe Biden. He said, yes, duh. Isn't that interesting?

Yost: Yes.

Nycum: So, who supported, well, NSF was the basic one. We did the work from grants. You couldn't get a grant — I would get my grants through the SRI connection and then I did a study. The law school doesn't do studies, you do studies *at* the law school. This was explained to me by the then dean that you get your grant, and you get everything ready, and then you go get together with one or more of the professors, and they agree to work with you. But it's *at* the law school, not *of* the law school. But SRI, it was directed by SRI.

Yost: And can you talk about the research methodology for that first project studying computer abuse?

Nycum: When we went running around talking to people? Yes, perps. [Laughs.] You did a 360 interview. You interviewed, obviously, the bad guy; you interviewed the law enforcement people; you interviewed the legal system; and you went, in many cases, into the prisons to talk to the bad guys. That was quite interesting. I'd never been in prison before. Very interesting. It was good that there were two of us. What would you like to know about it? I'm sure Donn's told you in great detail.

Yost: Yes, but one thing we like to do as historians of oral history is get multiple perspectives, as you did those 360 interviews to get different perspectives. So how forthcoming were the convicted computer criminals?

Nycum: Very. A lot of times it was to justify what had happened. "I did it to show that there was a weakness." "I did it because I had an unmet, unfulfilled need that I couldn't fill any other way." Occasionally, to show off, "I did it." But it was usually some need or a theoretically patriotic reason for showing there was a weakness and "I never intended to hurt anybody." Oh, but some of the stories! I remember a district attorney talking to me and he said Susan, these kids are spooky, they're trying to play star wars with real airplanes. They don't have any connection between the fact that they can bring down a plane and that there are people in it. It's like a computer game. I was shocked. So there was a disconnect in some of their minds about what they did and having any hurt associated with that for anybody else.

Yost: Your initial research in this area predates personal computers.

Nycum: Oh yes.

Yost: Were these generally people that were working at companies or within government, that had access to computers?

Nycum: Sometimes. Sometimes they used social engineering to get what they wanted, like numbers and access codes, which were on the mainframes. And sometimes they were just stupid. I think the most stupid one was the fellow who he knew he could get into the printing area of the machine, and he hit the repeat button on the printer for his paycheck, and so he had multiple copies of his paycheck. But he took a fistful to the same teller. Now, come on! [Laughs.] We didn't catch everybody but I'm sure we caught the bottom of the barrel. And then we saw some stupid security things, too, like — oh, Donn was not involved in this one — I was asked later on, we'll get into that. I was auditing the Social Security Administration, and auditing the IRS, and I did that alone. But boy, oh boy, some stupid things; which makes me think the really smart guys never get caught.

Yost: In talking to Donn about this a while back, he really seemed to place emphasis on the people and that computer security really was a problem with individual people, it wasn't something that could easily, or perhaps, should be solved by technical means.

Nycum: You know Donn is not as deep a computer systems expert as some of the other fellows and those other fellows — of course, everyone with his own blinders — those

other people, some of whom are very close friends at SRI, would think it was all a technical issue. But, of course, I wasn't technical and wouldn't pretend to be. I think Donn was more on the cusp, so that he could see that it was — a computer is like any other kind of device: it can be used appropriately, it can be used inappropriately. So it's the man behind the gun, person behind it. And I tend to agree with him and I also tend to agree that the level at which protection was most successful was at the data level because you could get through a lot of walls, and if the data was protected you were secure. But if the data was hanging out, forget it. Or if people were careless or stupid at the outside level, and very careful about the data, then you were alright. Now I'm just wondering about cloud computing as I speak to you.

Yost: When you started doing research with Donn, did you get to know a number of the computer security researchers at SRI at that time, like Karl Levitt and Dorothy Denning?

Nycum: Dorothy Denning is a sweetie pie, she's as sweet as they come, and is talented and skillful as can be. She has no ego, she's just solid accomplishment. I admire her totally. I'm very fond of Dorothy.

Yost: And Dorothy, of course, is someone who focused on security of data, security with databases.

Nycum: We think alike, yes. And, of course, Peter is more technical. Not Peter Denning, he is too, but Peter Neumann is more technical. All the people interested in the other forms of security, such as encryption, are good pals as well.

Yost: Did you get to know Martin Hellman?

Nycum: Sure. Marty Hellman and those guys, sure. I just love technical people and they've always been very tolerant.

Yost: What were the greatest challenges to doing the research presented in that first computer abuse report that you did with Donn and with Stephen Oüra [final report to the NSF published in 1973]?

Nycum: Steve Oüra?

Yost: His name was also on that report.

Nycum: I don't remember him; I'm not sure where his input was. It was probably inside SRI. Challenges. Well, everyone to his own. I had several. My job was not at SRI. My job was to practice law at a law firm, and have clients, and serve those clients so it didn't matter. When I first was doing this I was a baby lawyer. I mean baby in the sense of new to the law firm and I took the California bar between the time that I ran the computing and went over to the law school so I was having to build a practice and a reputation and

you didn't do it on computer security. I can tell you there wasn't any money in that. So time was a problem for me, and resources and support were very much a problem for me. That was a personal problem. The other problem was getting the attention of people who had better know about this. It's like everything else — I've got a paper here on climate change — people don't want to know about some things. And so we worked when I was still at Stanford, we worked on how to categorize what we were concerned about, and how it would fit, and how we would express it, and to whom we would express it. And in that came these ethical discussions. I'm sure Donn talked to you about the ethics studies we did, ethical and not unethical, and all that stuff. I'm very much a white-knuckler and I had to fly to Penn State through the mountains in a snowstorm in the era — I'll never forget that one! — and give an ACM talk, then get back that night. Hmph. Fortunately everything was fine. But there was a lot of getting people to acknowledge it was an issue. And then once you sold it to the technical people, like the ACMers, then you had to take that and convince the decision makers in the legislatures, and so on, that there was a problem. So it was not easy. And so, again, that's when we used fear and greed.

Yost: How long were you a fellow at the law school before you joined a law firm?

Nycum: One year. At the end of the year, I had offers from IBM; I had offers to be a vice chancellor at the University of California system; I had an offer from a local law firm that was international and was representing a Saudi Arabian who was trying to buy the international bank system here, none of which I knew. But they would allow — see, I was a single parent — so I could stay here. The vice chancellor offer was down south;

IBM was in Armonk [New York]; and here I could stay, so I took that one and had an amazing experience working in the international group of that sort. And then I went to the oldest firm in California, where I worked in banking. [Laughs.] And what they liked about that was that I knew about such things as ATMs and I'd heard of Diebold. Anyway, I'm being facetious, but it's true.

Yost: So, were you just following an interest by continuing this research or were you thinking more strategically with your career? That computing is taking off, computing law is going to become increasingly important and you were preparing yourself to becoming one of the early pioneering experts?

Nycum: I WAS one of the early pioneering experts. I was, by virtue of the fact that I was already on the ground. I was already an expert before. I was an expert back when I was at Carnegie Mellon because I was doing this use of computers in the practice of law. I was already an expert when I was back at the University of Pittsburgh because of that. So I just built and built and built and I morphed from the use of computers in law, which gains you no respect from the law profession, into the use of law of computers, which gains you respect from both sides. And there was plenty to do there, awful lot to do there. Still is. It's getting more and more and more, but it's different all the time. I was supposed to be on a conference call this morning from 7:00 to 8:00, international one, about trademarks in the cloud and so forth, and I said no, I think I better get ready for this. But it's an indication of which had legs.

Yost: Do you know when the American Bar Association started the Science and Technology Section?

Nycum: Yes, because I was one of the starters.

Yost: When was that?

Nycum: I was chairman of that section so long ago I can't remember when we started. I'd have to check it out. But it was real early. . I think it was in the 1960s. There was a turf war with the patent section, so we were allowed to have our own section as long as we didn't do patents. And now we're huge, incredibly large, and we have a whole cyber committee, and all kinds of stuff.

Yost: Was computing discussed or was it a part of interest for the start of that section?

Nycum: Yes, there a couple of us, maybe four or five or us. We were interesting people. One was the dean of the law school at Notre Dame, one was a principle of one of the large, large, mega firms in New York, one was out here in Seattle and he had — still has, I think — the record for single engine flight around the world. I have some photographs of the days when we would go places and have our meetings. One of them, we went down to San Juan, Puerto Rico. I remember that one well. But there were just a few of us.

Yost: And what about the origin of the Computer Law Association?

Nycum: I was not a founder of that one; I was the second — let me think. There were two men who founded it, then there were the rest of us who came in. It was Roy Freed, and Bob Bigelow. This is the first year I haven't had a Christmas card from Bob and I hope he's okay. They both live in Massachusetts. I was president of Computer Law Association. I was the first person to be president of both organizations.

Yost: And when was that started? In the 1970s?

Nycum: Yes, I'm sure it was.

Yost: While you were still at Stanford?

Nycum: Probably. Probably. I kept a fairly low profile. There were so many people who said what are you bothering with this stuff for? We don't want you to do it. You know. Thank you, I'll be good; I'll be good. [Laughs.]

Yost: What was some of the early work done by the Computer Law Association?

Nycum: Well, what we did was we would sit around a room, and we would help each other with problems we had that we didn't know how to solve by ourselves. That's what we did, and then occasionally, we would give a little symposium to see if anybody came. I organized one in the Stanford Law School, and that's when somebody accused me of

being a dilettante. Why don't you just do something? One thing. Stop wasting time on these organizations and things. But oh, they were good. All kinds of things were being discussed for the first time, like how would you protect software? What is software? Is it a thing? Is it an idea? Can it be patented? Etc, etc, etc. And I would testify to the CONTU about [it], and they'd say, okay, backs to the wall, what form should we take? I'd say, frankly — thank God I said this — frankly, it depends on what the software does, what it's about. Some things can be patented, some things are best copyrighted, and some things you just keep secret, and some things forgotten. It turns out to be the truth. We had the Privacy Protection Study Commission that we had to testify to as well.

Yost: That was co-lead, or lead by Willis Ware?

Nycum: Yes. Willis was a wonderful man, really fun. Kind, smart as can be. I said Willis, what a lucky time I've had, and he said luck comes to those who are prepared. Just a wonderful man. And Paul Baran, do you have Paul Baran in there?

Yost: Yes, we've done an interview with Paul Baran. He was a brilliant, wonderful, generous, and kind-hearted man.

Nycum: I adored Paul. My car came from Paul. Paul said oh, my ashtrays are getting full. How long before you need a new car? I don't need a new car, Paul. Oh no, I think you do; my ashtrays are filling up. He was just so smart, so able, could do anything. Really. Once I applied for something I wanted and I asked him if he'd write [something

in support], so he said — I treasure this — he said whatever he said, and then he said Susan is smart, very smart. I nearly croaked because he's an awesome super intelligent man, right? And so kind and generous. Some of those Nobel Laureates I worked with — wow — they are sort of self-focused. But not Paul, he gave credit all over the place.

Yost: You brought up the Privacy Protection Study Commission. Do you recall in your testimony what you talked about?

Nycum: Oh, yes. I used to represent the United States at these conferences, councils, etc, internationally, and the Europeans didn't like us very much. In fact, at one point, they put all the ladies from all the countries, at the head table except me, as a smack at the United States. I thought that was quite — I didn't mind — but I thought it was not cricket. But, yes, I took a position that they didn't want because what was really going on was that the Europeans didn't want to share their data. And they were afraid it would all come to the U.S. and we would use it. And all the companies would send their data here, and it could be freely used here, and they wouldn't get the benefit from it. So that was the political agenda. You didn't check your biases at the door, at all. So I learned for the first time about the fact that there is advocacy truth, as well as scientific truth in scientific diplomacy..

Yost: On a different project that relates a bit, but not a whole lot, I'm writing a book on the history of computer service industry, doing a case study chapter on time-sharing. And I learned from that research that their opening of the Paris office of Tymshare was

important, in part because of data and the notions and predilections of the French toward privacy and not wanting to rely wholly, or part, on the data facilities in the United States. The French, and in general, the Europeans have been more proactively trying to protect privacy [pause]

Nycum: Sweden took the lead. Jan Fraser was the first commissioner of privacy or whatever in Sweden, or something like that. A fine fellow, no question about it, and well-intentioned and just doing his best. But some of the other agendas were different than his. In the U.S., we give away privacy at the drop of a hat. Do you want a cell phone? Tell me your social security number. Okay, here it is.

Yost: At the time, what was your opinion of the 1974 Privacy Act?

Nycum: Well it was watered down. It was negotiated, of course. And it was positioned with the other one, which is the FOIA, Freedom of Information Act. So, the two of them were — there was tension. So I was always having to explain to people that this tension was the way this country works best, where you have an equal opportunity to get things to work. So it was the best job we could do, at the time, and of course, applied only to the federal sector. A lot of the abuses were not in the federal sector, but we had to start somewhere. Now, of course, you can't get your child's grade; well, that was true when my daughter was in college, too.

Yost: Do you recall when roughly you became a member of the ACM and when they first started to get involved in issues of computer security and privacy?

Nycum: I got involved in the ACM either at the University of Pittsburgh or Carnegie Mellon, one or the other. So that was 1960s. I've been chairman of the lawyers committee there; I'm the chairman of a number of different committees. I'm a fellow of the ACM. Have been forever. We even had a user services committee that was fun because we could all share the horrors that we had when we were interacting with the customers. And what did I do? They had a Hall of Fame, of which I was a member.

Yost: Do you recall when the lawyers committee was first launched within the ACM?

Nycum: No, it was in the 1970s, but I don't know. A wonderful man who knows a lot about this sort of thing, and I'm sure Donn has mentioned him, Oliver Smoot, Oliver R. Smoot. He was head of CBEMA.

Yost: How do you spell his last name?

Nycum: S-M-O-O-T. He's in San Diego. He was with the Bureau of Standards, after that. He's a lawyer. Oh, he's the one — the Smoot marks on the bridge in Cambridge between Harvard and M.I.T. Those Smoot marks are painted to keep them fresh. Well they came about because Oliver, who's five-feet-eight, was picked up and put down, marked; picked up and put down, marked; when he was a freshman. Oliver is 70, I think,

and they're still being painted. And it's been mentioned in the *Wall Street Journal*, every time they paint the Smoot marks. Oliver is marvelous; Oliver is one of our close pals, of Donn and me. Oliver would often have us over when he was at CBEMA. I don't know what it's called now. It has a new name, but it used to be the Computer Business Equipment Manufacturer's Association.

Yost: Would you have his email address? He sounds like he'd be a good person to interview.

[BREAK]

Yost: We took a short break, and one thing you mentioned off the recording was what prosecutors wanted. You interviewed a number of prosecutors. Can you tell me a bit about their perspective in the 1970s and early 1980s with regard to prosecuting computer criminals?

Nycum: Yes. First of all, I have a great deal of respect for them, particularly in the federal sector. They're very, very able and trying very hard to do their jobs well. What they are after is something that works, something that helps them get the job done properly. So when I would interview them, they would tell me that they preferred not to have a brand new law about computer crime, the big one, or as it evolved into computer hacking and so forth, that wasn't particularly useful to them. They needed to get a

conviction and so they needed to have all the experience of what you needed to do to get a conviction that came from the tried and true things like wire fraud, and mail fraud, and other related statutes that had been in place for years. And if that could be used to prosecute a computer crime they were very comfortable and they would never use a new computer statute, crime statute if they could use the old one that worked. So I thought that was very helpful information and a lot of people were arguing quite strongly that we needed to get something brand new, and so on and so forth. It seems to be a pattern when something new comes along everybody wants to treat it as if it's never been seen before by any of the societal regulations. But the truth is that it's much easier to treat it as though it's not a difference in kind, but a difference in extent and that would make it work better.

Yost: Going after computer criminals using some laws that have long been in place, such as wire fraud and mail fraud, were prosecutors able to get longer sentences compared to...?

Nycum: No, they were able to get a conviction. Because there are always holes in new statutes. For example, in the copyright law, the criminal aspects of copyright law, you had to, at the beginning at least, you had to have had financial gain. If you didn't have financial gain and you were just displaying or distributing copyrighted information just for no gain, no harm no foul. Well, there was harm and there was no foul. And so this is an example of a thing of that sort.

Yost: When you think of a crime, in general, there's obviously a very high percentage of repeat offenders when they get out of prison. Were you finding that to be true of computer criminals or were many of them—

Nycum: One-offs?

Yost: Yes, one-offs.

Nycum: There were REPEATERS, but there were JUST a few. There were some people who just happened — I mean, they had criminal intent and they were just looking for a way to exercise it in a new and exciting manner, or more effective manner. I think of one person in particular, who was a young person in Los Angeles, who I can't remember was convicted or not. But he turned up later doing some sort of Ponzi schemes and things of this nature, having nothing to do with computers. But he just had that bent to [him]. But mostly, they were one-offs, I think.

Yost: The trade association, ADAPSO [Association of Data Processing Service Organizations], began in the early 1960s actually for service bureaus but soon for the broader services industry and the software products industry. What were your earliest interactions with ADAPSO and what types of things did ADAPSO do to become involved with studying or influencing computer security and computer crime?

Nycum: I'm not remembering the origin of the relationship terribly well. I remember ADAPSO. In fact, the general counsel for ADAPSO was one of my pals in the Computer Law Association and he would come to these conferences at Stanford. He had been on the Nuremburg Trial Group as one of the prosecutors and is long gone to his reward, but he was very able, was a fine fellow and a nice guy. And then another friend who in fact lives around the corner here, was a head of ADAPSO. It was the chairman. I guess the chairman would change and the president would stay, I think is how it worked. I remember giving talks to ADAPSO at conferences, but Donn would know more than I about that. I'm sure if we gave talks there they must have been doing something with us.

Yost: In 1976 you published a book titled, *Your Computer and the Law* with Robert Bigelow. Can you tell me a bit about what led to this collaboration and why you decided to write this book?

Nycum: Bob is the one who I haven't heard from this year, and I'm worried, and I should get on the stick and phone him. Bob was active initially in the ABA [American Bar Association] Science and Technology section, but he was one of the founders of the Computer Law Association. He's a wonderful writer and a fine lawyer. And [he's] interested in this whole area, the intersection of computers and law but never played an active role in the business of it. So I knew that I, having run a couple computer centers and been principal in a third, I knew pretty much what computer center people and computer operations people needed to know and didn't know about it. And Bob was a real scholar in the law. He went — in fact I can just hear him say — to the college and

the law school, which of course, means Harvard. Just a fine, fine man. We collaborated and we would meet at all these meetings and sit down for several hours and go over lines and text, and all of the rest of it. And so he would bring to the party this wonderful ability to write, and I would bring to the party the knowledge of how it worked, so that's how we collaborated.

Yost: As you stated early in this book, the book is really focused on being useful to the computer manager.

Nycum: Yes.

Yost: What were the key differences or demarcations between federal and state law regarding computer abuse and computer crime?

Nycum: Nobody had any laws at all, as I said. The obscene and harassing telephone call, I think that was a federal law. But it doesn't matter, it was inapplicable. The wire fraud and mail fraud, those are federal statutes. So we started with the federal because the attention getter was there, and we testified a lot both to the House and to the Senate and received the support. As I said, Joe Biden *got it* — was very hard to find people who *got it*, even staffers were not as able to *get it*, even though they were considerably younger they were still not. They hadn't been exposed to this. Today, it's not a problem. For example, Sandra O'Connor and I were talking about the whole idea with the Supreme Court and about computers. She said, well I'm now learning because my law clerks are

now these super bright young law students who know about computers from when they were kids. But then there was none. There were some silly laws, some silly cases, because they just didn't know any better. So we started with the federal, thinking trickle down, also that's where the NSF money would be best spent. And then we got the attention of some of the legislators. Florida, for example, there was a gentleman in Congress from Florida who was very good. I used to go around the world, being invited, as I said. Jamaica now has just asked me for some help and it's all in this area. Now, Jamaica hasn't a cyber crime problem. They think they might. And have they needed to do anything all these years later? They suddenly say, oh!

Yost: Do you recall when you first testified before Congress on computer crime?

Nycum: No, it was in the 1970s I'm sure.

Yost: And you did, multiple times?

Nycum: Yes, I did. Seriously, you don't want to use this but it's true. I didn't know anything about what you did when you testify. I didn't realize that sometimes there were people like you said, talking into a recording mask like thing and very distracting. Or whether there were typists or simultaneous translation or what was going on. That was really quite annoying because it would oftentimes be international or for the record and I didn't know how to make the best impression. There's a whole lot of stuff now about how women are running more and more of the world. My best friend is running the IMF

and she's just doing it perfectly, but I didn't know. My mother would say, wear something nice that you would wear to a nice event. Well that would, of course, not be a mannish-looking piece of attire, which the senators and everybody would be expecting because everybody else was lined up in a black suit, with a white shirt, and a red sincere tie. What did I have that would look like that? Nothing. So I began to wonder later if they were really going to hear what I had to say because I was so bizarre. [Laughs.] But apparently they did, and that was a good thing. But it is interesting, you know, just as a historical comment.

Yost: Do you recall any of the testimony that you gave on computer crime issues?

Nycum: Yes. It was usually pretty pedestrian because it had to be said quickly. It had to be said in sound bites, and so on. And it had to be said with animation but you couldn't use any automation because there wasn't any in the hearing rooms. No PowerPoints available. None of those things were possible so you had to use your own voice and wear your black suit with your white shirt. I remember one time I was on a plane coming into Washington, I was going to talk to the Senate, and the plane tried to land three times on the runway, and there was somebody always there and had to pull off. Being a white knuckler, this was very upsetting to me. So when I gave my testimony that day, somebody came up to me and said, what was the matter with you, you were so flat. I said well, ay-a-a-a-a! [Laughs.] Yes. It was usually a bit of a pattern. We would give examples of the four categories of computer crime, the kinds of laws that were available, the kinds of holes in those laws that were available, what needed to be done, and how you

would go about it. Sort of a template. But mostly, it was about questions. They were dying to ask questions and they *loved* examples, anecdotes.

Yost: And from your research with Donn, you had many to choose from.

Nycum: Oh my, yes.

Yost: One area of computer security that a small team of researchers at SRI did a great deal to pioneer was intrusion detection — Dorothy Denning, Peter Neumann, and Teresa Lunt — in IDES, the intrusion detection expert system. What impact did that have on identifying computer criminals and prosecute them? Did it have much of a real world impact that you were aware of?

Nycum: At the time we didn't know. Did not. I have a very embarrassing anecdote, and that has to do with the way that people got into Stanford Center. We were planning what we had to do to forestall intrusion. There had been a row of eucalyptus behind the center that was sacrosanct. It was the Governor's Walk, when the governor came to Stanford. They were proposing to cut those trees down because people could climb up those trees to go to the roof, cut a hole in the roof, and come down. I'm not kidding, this was really serious. How did they get in, really? Some numbskull had left the keys to the center on the outside of the door. So we were building steel doors and paper walls.

Yost: Always the weakest link.

Nycum: Sure. And that's 9/11 all over again. But if you had something that would show unequivocally how it happened and who did it, it's like fingerprinting and stuff. Sure that's useful in identifying but after the fact, but I still think it's weakest link. Can I tell you one thing that's another example, the Social Security Administration?

Yost: Sure.

Nycum: Wow. When I was auditing them, at their request to the national academy of sciences, they had mantraps and the whole nine yards, right? It's just huge. They showed with great joy everything that they had. Then I realized that there was a woman sitting out, controlling all of the access, and she was unarmed, and she was paid an entry level wage. She was the vulnerable point, not anything else, because she could be compromised and she had the override button under her control for all of this stuff. That's one. Then on another trip I was asked to audit the IRS. So we were talking about the bombing, going over Martinsburg, and dropping bombs, and things like that. All I did was walk through the front door of the facility, where all the tapes were, and asked if I could use the ladies room. Oh sure, it's down the hall. So I wondered around. I went through all the tapes with my pretend Degausser and the whole bit. Nobody after me. So that's why I think that there are an awful lot of silly things done in the name of security.

Yost: So just physically securing access to computing facilities is one of the core problems?

Nycum: One of the core problems. And still today you can walk by a lot of the Silicon Valley windows and see all the goodies on the blackboard, through the window. You don't need a drone flying over.

Yost: When you started working for Chickering & Gregory, how much of your work was involved in computer crime?

Nycum: If we got a grant and there was some money in that for the researchers, that went to Chickering & Gregory, my employer. Otherwise, it was my own time and I remember being invited by the associate review committee for salary increments. Now tell me, he said, just what is it you do? So it was a labor of love. It's a labor of interest. It's a labor of necessary for the world, and that is good things. But was it paid, was it part of my paid time ? Trivial.

Yost: Very few billable hours. Was a lot of your billable time on intellectual property?

Nycum: I did big, big studies for clients, which I looked to see what the law was around the world. And I did transactions, starting companies, that sort of thing. The other stuff came later because at the time, intellectual property, all you did was invent ahead of the other guy. You didn't protect anything, you just kept going.

Yost: There were a few incidents. I know Applied Data Research got an early software patent but not many software products companies were going that route, were they?

Nycum: No, because it was questionable whether they would patentable subject matter. And in fact, in 1974, it was a famous case in which they were turned down, the Benson Case. Later on, in 1981, Diamond v. Diehr case was the first time, and the US Supreme Court cited me, my work at the time on a case. But part of that [was] they were much faster at recognizing biotechnology inventions than anything that was — if you had a machine involved in it, you had to make the computer machine be the invention, by saying in a backhanded way that the software had changed the machine. But standalone software, no. That was another labor of love, a different one.

Yost: And what about copyright protection?

Nycum: Copyright protection, to this day, protects expression, but not the idea.

Yost: So just a different way of doing the same thing.

Nycum: Yes. But, internationally, there was a big fight over whether the expression had to have original [content] — Germany, in particular, had to be original. So it didn't help if there was no creativity, originality, inventiveness.

Yost: In the 1980s there were a number of high profile hacking cases. How did that change the landscape for how people viewed computer crime?

Nycum: It got attention, which is the primary benefit, I think. And it was “catch time” around the world and we always like to keep up with the Joneses. When they start looking like they were going to get us, why, we [pulled] our socks up. But I think it was primarily that there was so much attention and that the victims now were institutions who didn’t like it, and who had stockholders that didn’t like it, and so forth. And oh, our government, how about getting hacked when you’re — remember when NSA got hacked? [Laughs.]

Yost: Yes. I notice that you were also a past president of ITC Law Association. Can you tell me about this association, and its origins?

Nycum: It was then the Computer Law Association that we talked about earlier. Now just a couple of years ago, it became international and I went just a month or so ago to the annual meeting and they are really international now, delightfully so, and worried about many more sophisticated things than they ever were. But they’re missing one part that I’m doing a lot of work in now, which is dispute resolution. So I hope that they get more active there, that’s something that needs a lot more attention.

Yost: Can you tell me about the history of international law with regard to computing, when did that begin to take off?

Nycum: It was after we'd done it here. It got caught up by people who belonged to OECD and Council of Europe, and so forth. And then everybody else would get on the bandwagon. I used to go; I'd be invited by these countries. Canada, Brazil, Israel, Denmark, Germany, India, Singapore, Thailand, places like that. They were realizing they had a problem, they looked to see what they needed to do, and they decide they might have to revamp something. I'd say don't revamp at all, that makes a big project that would take another year or two. Look at what they already had and we'd talk about what they needed as gap fillers.

Yost: What were the challenges to prosecuting criminals from abroad? Can you talk about that aspect? That were attacking either U.S. companies or the U.S. government but doing it from overseas. Was it difficult to extradite and prosecute?

Nycum: It depended on where it was, where they started. Also, to prove. The law, which law applied? Was it the place where the injury occurred, where the bad thing happened, where the computer was? Or was it where they started it, where they had the connection? Because these would be electronic connections, and so forth. And then the cooperation from the host country. And then all these allegations of picking on people.

Yost: In this year of ubiquitous computing, mobile computing, and much of the world connected to the internet, what do you see as the greatest challenges moving forward?

Nycum: So many. One is accessibility. Paul Baran and I, and others under Paul's direction, were thinking about how to make computing available over satellites to remote places so that people would be able to connect. So that's one thing. Related to that is the idea of money, and how that's transferred, and whether it's better or worse to have — the trend seems to be to going to non-coin money, and whether that's better or worse, because banks have been nothing but computer systems for years, although it's generally not recognized but it's true. But it'll be right in our faces when people transfer things entirely electronically, so that's a big challenge for computer security, unlike Brink's trucks. That worries me. I'm a little bit nervous about the lack of privacy. I think we pretty much have to agree that it's almost gone. [I'm] very much worried about intellectual property protection, but there was a wonderful article written years ago about what do you do in this case, where people can steal your presentation, totally. And the answer was that you don't sell that; that's a giveaway. Your book is a giveaway. What you sell is your knowhow, your consulting and so on. The problem with that is that the big money is in the mass replication, not in the one-to-one consulting, so I'm worried about that. I suppose there're a lot of other things I should be worried about as well but you can get paranoid if you spend too much time on it.

Yost: You just mentioned the different countries that you served as an advisor to. Can you talk a bit about the differences between some of those countries and how they view computer crime, and what particular challenges individual countries face?

Nycum: You know that we have in this country and in the common law countries both legislative and court-made law. In the civil law countries, it's pretty much the legislative. In other countries, it may be something different. So they have to find out what they already have and what the holes are, and the best way to address it. That's when you come down to the theory of we'll throw it out and get a new one, which works some places, particularly when there's not a whole lot of material. Or, for example Singapore, I went to the law library at Stanford to find out the laws of Singapore and my God, it was impossible to find them neatly, tightly organized. So sometimes it's better to have something brand new. And other times you're like ah, this is where you want something there's been a lot of experience with rather than something new, because it turns out that there's legal precedent involved and other countries don't necessarily have that. It basically boils down to how much law they've already got, and whether they want to start fresh, or whether they want to plug holes and how they go about that. But they have to understand what the challenges are first. In other words, what are the problems. Here is the law they have. What are the kinds of things they want to worry about. How do they phrase what they want to worry about so that it's going to be useful when something happens they never heard of before. That's fun.

Yost: I know that Donn was central to the formation of I-4. Was that something that you were also involved in?

Nycum: Not really. That was an SRI initiative. It's a for-profit kind of initiative for SRI.

Yost: One thing that I neglected to ask you earlier about your time at Stanford, in running the computing facility, was there either an informal or a formal organization to bring together top administrators of computing facilities to share ideas and best practices with regard to a) the operation of the facilities, and b) of course, the area of security?

Nycum: Limited. There weren't fiefdoms, but the administration that is running the money at Stanford and running the courses, they were COBOL shops. Eeeew. [Laughs.] Some of my friends were in charge of them and I see them out running, and I think about those days. But that's the truth. So we spent time with the other facilities that were doing academic or research. And that would be only ourselves — in my time — was only ourselves, SLAC, and the medical school ACME. Now, my grandson, whom you saw departing the scene for fame and fortune in Silicon Valley, he was very involved with the campus wide system now. And they have this huge [system] because it's all these PCs linked, and stuff, so I can't speak to it now, but I don't think so.

Yost: What about interaction between different academic center institutions, with Berkeley, both regionally as well as nationally?

Nycum: Oh, well of course, those of us who are in the highest echelon spoke only to God, right? [Laughs.] There was always this question at NSF — I was on this NSF committee — should we extend the ARPANET to additional schools? And we looked at each other and said, why? And then we said oh, naughty. [Laughs.] We did. Well you

know very well how snobbish academia is, it's horrible. And then of course, we'd see everybody at ACM, or at SHARE, or something like that.

Yost: Were you also at all active in the Computer Society or primarily ACM?

Nycum: IEEE Computer Society, marginally, very marginally. Even ACM after a while got so esoteric it was hard to understand the communications, and so we would work in the committees. Bob Bigelow was in the Computer Society; he was very active and still is, so he would tell me about it.

Yost: Did you attend the annual Oakland Conference, the IEEE Security and Privacy Symposium, that was for many years held in Oakland?

Nycum: I went to one. I remember that strongly because Richard What's-his-name came up. You know, from M.I.T., the open source fellow, computer left.

Yost: Stallman?

Nycum: Stallman. Wearing a big, black bat suit. I was standing there minding my own business, all of a sudden this black bat is coming, enveloping me. What?! So I did go to that. [Laughs.] I don't know that Donn and I went to everything we could go to because we had to work. So I think we basically went when we were giving talks, and things like

that, unless it was a personal love. You know, you might have a personal love for a particular place where you were a committee chair or something.

Yost: In your highly prolific career, I'm sure there are many things I missed. Are there topics that I haven't asked about that you'd like to discuss?

Nycum: That's an interesting question. I'll have to think about it. You will send me what we have so far and I'll see whether there's something burning I wanted to share and I forgot to. Some of the people I think are very important; George Glaser, and some of the great teachings from these folks. A lot of them were very personal, not just — I shared with you what Paul Baran was kind enough to say. And George Glaser asked me to write the Computer Encyclopedia that he was editing, the part on law. And I said something about I'd be honored, and he said Susan, from now on you are not honored, you are pleased. I thought wow, that's interesting. So I went home and thought about that one but isn't that curious? So there are lots of things that being with these wonderful icons, and just like Perlis saying he guarantees not to fix a problem he knows nothing about.

Priceless, isn't it? So, I think that overall, the best thing is those [people]. Oh yes, and then there was when I was the mother of a first grader. My little boy came home with an "F" because he'd colored outside the lines. And his father, who's in advertising, said not only did he color outside the lines, he made the ice cream cone purple, who's ever heard of that. Wow! [Laughs.] Yes. So I guess I'll think about it, if there's anything, because a lot of it was done with Donn but we didn't overlap totally. Oh, I didn't tell you one thing. The first time that computer abuse was ever brought to the attention of the legal

community I put together a proposal to the Practicing Law Institute that we discuss this. Now, the PLI is where lawyers go to get training outside their law firms and their law schools, and they're for practicing lawyers, and it's really for very high level. And I thought boy, there's a big hole here so I proposed that we talk about this. And I got Willis Ware and Donn Parker and some of the other leading lights to be there for a day and that was the first time. The lawyers were blown away and they asked for it over and over and over and over. Donn might not remember that but it was in the early 1970s.

Yost: Well, thank you so much, this has been wonderfully helpful and a great addition to our project. And [it] covered some new ground.

Nycum: Well, I'm sorry to be almost orthogonal to what you're doing but it happened.

Yost: It's really an important component and from the start of our project, we definitely envisioned the criminal justice side as a very significant part of the computer security project we wanted to cover, so this has been really wonderful. Thank you.

Nycum: Indeed. And you know about Don Ingram over in Oakland? I'm sure Donn Parker told you about him.

Yost: I think he's on our list.

Nycum: Yes, he's absolutely important. And I would put down Joe Biden. He probably won't even remember but he did get it.

Yost: Well, I'll see if I can get an interview with him. [Laughs.] That would be tough, if not impossible. Speaking of famous politicians, I'm trying to work on some people that might have connections to Ross Perot, to interview him for my computer services industry history book.

Nycum: Oh, he's a lovely man. Is he in good health and everything? He's older.

Yost: He is. I visited the IBM archive to do some research a couple weeks ago and their archivist had met with him fairly recently and he was in good shape.

Nycum: They're so nice.

Yost: Thank you so much, this has been extremely helpful.