INTERVIEW WITH
ED ROBERTS
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Sloan Oral History Series

B: Bob McKersie
A: Alan White
E: Ed Roberts

B: The place to start is to tell us when you first came to MIT, and how you were located within this organization.

E: I came in September 1953 as a freshman…

A: You were from Chelsea, is that right?

E: Yes, I commuted as an undergraduate. In my first semester, freshman year, I had one elective and I took 14.01, which was first-course Economics. It was 1953, and we used Samuelson's textbook, which was I think published in 1947.

A; Do you recall who taught the course?

E: I don't. Somebody in Economics, I think.

I liked it so much that in my second semester I took 14.02. So that got me on the dual pathway, because there was no question I was going to be in electrical engineering. I started, in my sophomore year, overloading in the management school and taking elective subjects here as much as I could. I typically was taking two overloads every semester, more than I was supposed to, and being yelled at by my faculty advisor. But I did it. So I was taking all the undergraduate courses in the Sloan School while I was moving ahead in EE.

A: Was it the Sloan School then?

E: No, the School of Industrial Management (SIM). And it was a very different kind of place. In a way, it was a glorified industrial engineering department.

A: What year was that when you were a freshman?

E: 1953. But the first courses I took in the Sloan School I took as a sophomore, so that would have been September 1954.

So all the time I was an undergraduate and graduate student – because I got into Course 6A, which was the co-op in EE, so that was 5 years for 2 degrees. So all the time that I was registered in Course 6, I was taking subjects in Course 15 as well. Therefore I began observing things about the School, and seeing people, while I was an undergraduate. But I had nothing else to do with the School.

In one class in my junior year at SIM, there was an instructor (I'm sure he wasn't a professor) who made some comment. In those days, an elective here in management would probably have half engineers in it, not just people registered in Course 15. He made the comment, "You guys think you're so smart – we've got the guy who invented the computer coming here now as a faculty member."

I poked the kid sitting next to me and said, "What in the hell is John Von Neumann doing coming to this place??"

And he looked at me and said, "I don't know."

So I raised my hand, in my – as you might anticipate – in my not terribly reticent manner – Ed Schein could testify to that because I was in the first class that Ed Schein had ever taught. I was one of his students, and he remembered that I was not a reluctant participant in class discussion.

So I raised my hand and said, "Who is this guy that invented the computer that's come here??"

And he says, "Jay Forrester."

Well, of course everybody in Course 6 knew who Jay Forrester was, so I poked the kid beside me and said, "Well, Jay Forrester didn't invent the computer…"

So class was over, I had a break in my schedule, and I said, I'm going to find out what this guy's doing here. So I went up to the 4th floor, went into the Dean's Office, and said, "Could you tell me where Professor Forrester's office is located?"

And whoever was there pointed down the hallway and told me where to go. I went down and introduced myself to his secretary who was Cathy Brownell and who stayed with him for many, many years. I said, 'My name is Ed Roberts, I'm a junior in EE, and can I possibly meet Prof. Forrester?"

"Well, what do you want to talk about?

I said, "I just would like to find out why he's here and what's he planning to do."

So she said, "Just a minute," and five minutes later I'm in Forrester's office and we chatted.

So the short of it is that I then went back to Forrester 2 more times during the next two years to tell him that I was interested in what he was doing, what he was planning, etc. So therefore my aggressiveness was getting in on the ground floor of whatever he was up to.

In 1958, Forrester decided he was ready to move ahead with System Dynamics. I was finishing EE, and he hired three of us who were graduate students in EE, to come over to Sloan and become his full-time research assistants. (Jay had worked for Gordon Brown as his assistant during WWII in the MIT Servomechanism Lab.) The three of us were Will Fey, Jack Pugh, and me. Jack Pugh was a doctoral student in EE at the time; Will and I were just finishing our Master's degress. And the 3 of us became Jay's first RAs to create Industrial Dynamics.

So that was my entry. That was 1958. Since I was here, I said, "What the heck, I might as well finish my Master's degree in management." I didn't need many more credits. And as a full-time RA, you could take 2 courses a semester. That was a status that doesn't exist today around here. Full-time RA. So I took 2 courses free. So I finished off. I came in September 1958, and I got my Masters from SIM, the School of Industrial Management (I think it was still SIM)—in February 1960. So it took me 3 semesters to finish my Master's degree at 2 courses a semester.

Then I had decided I was going to stay another year, maybe, because I thought industrial dynamics was interesting and it might be good to hang around another year before

leaving for the real world, likely to become and engineering manager, I thought. The management school didn't have a Ph.D. program yet so I decided I ought to enroll in a Ph.D. program. I had actually been thinking ahead, so instead of taking regular courses in economics, I was taking Economics Dept. courses in economics. So basically I already had met all the core economics courses. I applied and got accepted to the Ph.D. program in economics, which I ended up finishing very quickly. I came in in 1960, and I finished in June 1962 with my Ph.D. in economics, again just taking 2 subjects each term.

My Ph.D. was on applying System Dynamics to R&D management. My committee, because the Economics Dept. would not accept Forrester as chairman of my committee but they let him be a member, was Forrester; Don Marquis, who was now a senior guy in the management school without portfolio as yet; and the chair was Frank Fisher from Economics. It was supposed to be Bob Solow, but he left, just before I got my proposal in, to become part of the Kennedy Council of Economic Advisors. As far as I was concerned, that not only broke my heart but I figured I was done; I was never going to be able to get a Ph.D. because nobody had Solow's open-mindedness or interest in technology and innovation. But in fact I sailed through rather quickly with Frank Fisher, based on a challenge -and - response approach to a dissertation. I'd write a draft of the next chapter, he'd challenge it, and if I responded satisfactorily I could move on to the next chapter.

Beginning in 1958, we had started creating the field of industrial dynamics. Nothing much had been done previously. Jay had an undergraduate do a very crude simulator for him prior to that, which he used to write his first article in HBR. But we had no underlying technology; we didn't have methodologies of coding or model development in any meaningful way, so we were starting from scratch. Jay brought in from Lincoln Lab 2 senior guys: Jack Arnow, and Richard Bennett. Bennett became in charge of development of computer systems for industrial dynamics, and I worked for him on programming for our first simulator, which we named SID – Simulation Industrial Dynamics. When we got around to our next generation language, I named it SIMPLE – Simulation of Industrial Management Problems with Lots of Equations! Forrester hated the name, but traditionally programmers retained the right of naming.

I don't know what Arnow was supposed to do except he was a smart guy. Then Forrester had hired, somehow, two assistant professors. They were economists. At least one of them came out of the Harvard Economics Dept. One was John Enos. Enos later did some very distinguished economic work on the petroleum industry, published a major book on the economics of petroleum.

A: Were these appointments in the SIM?

E: Yes. So Enos was one.

A: But they must have been a bit controversial in the Dept. of Economics?

E: I have no idea. I'm not sure how Forrester got them. I don't know what decision process went on to give him slots to hire 2 assistant professors. I would bet that Eli Shapiro had spent time talking to Jay about the kinds of models he wanted to build, and ended up concluding that maybe the best kind of people he could get would be somebody who had done some kinds of economic dynamics (which meant totally different things) but nevertheless might have been an approximation. The second junior faculty member was Joe Yance.

I remember what Yance called "economic dynamics" -- trivial kinds of little things that had nothing to do with what we were doing in industrial dynamics but that was economic dynamics. It would be interesting to see if Eli remembers why. All we knew, as graduate students, is that these guys were joining at the same time, and they were faculty.

B: Let me ask a question. One of the themes that have always been with us is: Do we have a way to connect with the Engineering School at MIT? And when we interviewed Jay, he saw his hiring as one way to make sure there was more traffic between engineering and what goes on here. And here you come out of engineering and mention 2 other people who were hired.

But as system dynamics developed, as Jay developed it, was there interaction with the Engineering School as a department?

E: No. None. And Jay would stubbornly say that only EEs were qualified. I used to argue with him, "What about chemical? What about mechanical?"

"No, no, only EEs understand OUR thing."

B: But couldn't there have been hires – was it, in a sense….

E: There could have been, and there were not. And when the first 3 of us were hired as RAs, no one else was brought in from the rest of MIT. All other later RAs were RAs from students in SIM. And they all reported to me, by the way, except for anyone working personally for Jay. After the first year, I was made in charge of all ID teaching of undergrads and grad students. Forrester taught the Sloan Fellows, which he liked for a few years until he gave me that course too, and the Senior Execs. But in general he didn't like teaching. So he turned over all of our new classes – we had a lot of sections in the first course in industrial dynamics, and they all reported to me as the senior guy – "senior" meaning I was one year older than they were.

A: Do you remember, it was Bill who made the comment about Eli – the reason he hired Jay was to bridge the school to EE. That was Bill's interpretation.

E: And did Jay tell you why he came? My understanding is that Jim Killian recruited him. Killian was president, and my understanding is that Killian recruited Forrester to come to the management school as, in a sense, Jay's next big thing. At the end of the war Jay took over the Whirlwind project and carried that forward as one of the first high-speed, major computers, and it was a very different kind of computer than the other projects that were going on. He was part of the Lincoln Lab founding group, with the Lincoln formation to create the SAGE system. Jay was in charge of Division 6, which was the computer division, and had systems responsibility for the SAGE system. So he was in charge of systems integration for the entire SAGE system. By the way SAGE stood for Semi-Automatic Ground Environment; it had intriguing implications as a name for protection of the US against mass bomber attack by the Soviet Union over the Arctic pole. But, certainly just a coincidence, the MIT VP of Research was Nat Sage. Must have been an accident!

B: He told us about going way out… to Alaska?

E: Yeah, absolutely.

A: Somebody should write a biography of Jay.

E; I suspect you'd find that it exists in tracks. Jay did a bunch of oral histories, did you know that? His oral histories of the Whirlwind project, that are accessible at MIT (and now he has been video recorded in the MIT 150 project – 2 sittings, I was told).

I think they were done as an IEEE project to document the early days of computers. I was watching recently – I happened to run across it while doing something with the museum, looking at stuff at the MIT Museum, because I helped them with this MIT 150 year celebration deal. So I was going through some stuff and I came upon this. I sat for about 15 minutes listening to badly taped videos where there was a panel of Jay and 3 others guys, including Bob Everett, who was his right-hand guy, talking about the early days of the Whirlwind project. They weren't talking about the SAGE system and Lincoln Lab.

But there were no other people brought into our ID group from outside after the very beginning, with the exception of a person hired to replace Dick Bennett. When Dick Bennett left to go out on his own and start a company, Jay hired a woman named Phyllis Fox. And Phyllis Fox didn't come from MIT or Lincoln Labs. She was hired from the outside, and she was a professional, highly skilled programmer. She came in to take over the next generations of our simulation language, which, with Jack Pugh playing a key role, became DYNAMO (DYNAmic MOdeling).

B: Well, anyway, Jay didn't gain status in Economics, and he didn't gain status in the engineering side of MIT, did he?

E: Gain status is a lesser statement than one could say.

A: Because they were quite critical.

E: Not engineers. The engineers knew nothing about whatever it was he was doing. I'm sure some people said, "Oh yeah, well, he's applying feedback systems to management" or whatever that meant. He aggravated the whole Management Science Group in the Sloan School and from there to the world. He aggravated the economists by the fact that from the outset he said that everything they were doing was worthless. And he said it repeatedly, loudly and with no qualms. That what they were doing was trivial and unimportant, that the models they were building were unrealistic, that they left out everything that was reality, that they weren't tackling the critical problems of the world, all of this.

By the way, that behavior is what caused me to start Pugh-Roberts Associates. I was a second-year assistant professor in 1963. I had five years' investment in industrial dynamics from 1958-63. Observing Jay and his behavior caused me to conclude that system dynamics would fail, and it would fail because of the fact that he was so hostile to everybody else. I went to Jack Pugh and said, "Jack, if we do not start a consulting company to try to bring system dynamics to the outside world and help other people to try to turn this into real-world practice, then we will have thrown away the five years' investment that we've made in this and go off and do something else." Jack was a very quiet and shy guy but he was very skilled technically and I trusted him entirely. I also thought he would fail to finish his degree and

therefore at some point want to leave and be full time in our company which I didn't want to do, at least I thought I didn't want to do. As a second-year assistant professor you're doing a lot of guesswork as to what kind of career you're ever going to have. So we started the company.

When we agreed to do it, the next day I went to see Jay Forrester. I walked into Jay's office. I said, "Jay, I want to let you know that Jack Pugh and I have decided we're going to start a consulting company called Pugh-Roberts Associates," because we decided Roberts-Pugh had the wrong smell specifically! So it was the Pugh-Roberts Associates and it's going to be a system dynamics consulting company and we're going to try to teach the outside world and help the outside world to do real and good things." And he looked at me. He always sat behind his big desk, never got up. Total engineer, worst manners in the world. So he sat there. I was standing in front of his desk and he said, "Well, Ed. Some people will feel you're not serious about an academic career." And he turned back to whatever he was writing, ignoring me. He was always busy writing. And I'm standing there trying to argue with him.

"No, no, really. This is important and I'm trying to make our field successful." And I'm saying all this stuff and he's ignoring me. And after about 30 seconds' worth of being ignored, standing in front of his desk, I turned, I walked out of the office. He was on the fourth floor; we were all up on the fifth floor. I walked to my office, I closed the door and I called Nancy at home. And I said, "Nancy, I think I may have just shot myself in the foot."

She said, "What did you do?"

I said, "I told Forrester we were going to start the company and this is what he said."

She says, "So what are you going to do now?"

I said, "We're going to go ahead and start the company."

She says, "Do you think you should?"

I said, "That's what we're going to do."

B: That's a great thing.

A: That you did it! As a second-year assistant professor!

E: Correct. In that time; today if you did it, it would be looked askance at anyway, but not with the same environment because today MIT is in a very different place… I have helped MIT to become a much more entrepreneurial place. But in '63 there was entrepreneurship taking place but it didn't have the same environment.

There was another thing that affected this. The fact that I had completed my Ph.D. in economics very significantly influenced me because the Economics Department to me was an absolute model of scholarship. It was to me inspiring in terms of how intellectual questions were the center of focus. And whether or not it was realistic… And I would be very critical. I 'd be in Bob Bishop's class tearing apart what he was saying about microeconomics theory and saying how foolish it was and that it had this, didn't have this. All of those things were true. I criticized them all. But I looked at the way they behaved as faculty, and I thought that they behaved with a commitment to rigor, to focusing upon data, to focusing upon careful analysis and the like. And I took that education that I was getting, while I was starting and helping build system dynamics.

I was sitting there being quite conflicted about what system dynamics was doing. And I was very bothered that Jay brought an engineer's attitude which was, as he interpreted it,

that the only thing that counts is tackling important problems and doing something in the real world that mattered. And that he had no academic commitment, he had no academic rigor and to me that was destructive of how he related and how system dynamics related to the economics profession and how it related to the management science profession. So I would see all of these people who were my colleagues basically being very skeptical about things I was doing because they would be listening to Jay's pronouncements. That just bothered the hell out of me.

So I figured, "OK, if we created an independent company, we can have our own values and we can have our own standards and we can do our own work and then we can be judged on a different basis."

B: Well, a couple things I'm going to ask in a minute. I'll give you a chance to eat.

We heard from a couple of people about how important were the early days of the school with that department you mentioned where Jay Forrester's office was. And we've heard in that same corner of the fourth floor was Doug Brown and Doug McGregor and Jay Forrester. And the implication was that they were all sort of interacting across intellectual traditions.

E: They did sometimes.

B: And that was seen as a good thing in comparison to the departmentalization that has occurred over there.

E: I suspect that was Eli Shapiro's wish.

B: To have that kind of mixing up of perspectives.

E: So did Jay tell you that in fact something meaningful came out of that coincidental office relationship?

B: No.

E: Did he tell you about how he got into urban dynamics? Walking out of his office one day at lunchtime, Doug McGregor was walking out his office. Oh, no, that wasn't urban dynamics, that was organizational dynamics.

So Jay always went for lunch, he was very big on eating lunch on a timely basis. Turned to Doug, "You headed up to lunch?"

"Yeah, sure."

"Well, why don't we sit together?"

Well, here's the story that we learned afterwards! They went and they sat down and had lunch together and Jay said that he'd been talking to Doug McGregor, he said, "So what are you doing now?" And he said Doug described the fact that he was working with the Sloan Fellows and that he was now in X week of the semester and working with them on T- groups. And that this week is the low of their attitudes and the like and it will be getting better beginning next week. And things will really work out by several weeks from now.

And Jay says—and he repeats this afterwards as a great story—he said, "Now wait a minute. How can you say something like that?"

And Doug said, "Oh! I've seen it all the time. It always happens this way, same pattern always. If you compress the whole experience by half, it will happen in half the time."

And Jay said, "Well, wait a minute. If you really believe that, you must have an underlying systems theory as to what is taking place in the group."

And Doug supposedly said, "Well, I never thought about it that way but I guess I sort of do have a theory." And he now explained to Jay what he thought was going on in group formation and in group behavior.

And Jay said, "That's really intriguing. It would be interesting to put together a group to model that."

And McGregor said, "Hey, that might be interesting to do."

And Warren Bennis, as the number two guy and clearly the OD guy in the group, joined with Doug and Jay, and the group became exclusive, they wouldn't allow anybody else in. The rest of the system dynamics group was not allowed to participate. There was a weekly meeting of Forrester, McGregor, Bennis, and a master's student named… Fillmore McPherson [L. Fillmore McPherson, III]. He was a system dynamics research assistant. And he was the one documenting the meetings and trying to put together the model. And he ended up doing his masters thesis on modeling the dynamics of organization change. And that came out of Jay walking up with McGregor. Now I think it's the only thing I ever heard of that was how the linkage of space affected them. I'm trying to think, how did urban dynamics come about?

A: John Collins.

E: Well, John Collins got involved but I don't think that Jay had met John.

A: Somehow I know he came over to MIT and then he left here. I don't know how that happened though.

B; A good man.

E: Well, one of my neighbors at the Heritage is a guy named Joe Slavet. Joe Slavet was an early director of ABCD, Action for Boston Community Development. Joe was on Collins' staff. Joe remembers clearly the seminars between Collins and his staff and Forrester and whoever was working together. He said, "We used to come over to MIT once a week for meetings." He said he remembered Cathy Brownell, Jay's secretary, bringing in tea and cookies every afternoon. He said it was very nice and very lovely. And they had weekly seminars around urban dynamics. How it started I don't know, but I know that that was the process that then…

So that happened with very heavy involvement. Jay decided at that time that he wanted to try to educate John Collins in system dynamics. So he had several of us come and talk to the Boston group, this Collins group about system dynamics. I was working on heroin addiction at the time, so I came in and I told them about what I was doing working on with NY City and what I was doing. And Collins listened to me and was very upset. He said, "You mean to tell me those hippies on the Commons are not all going to become heroin addicts?"

And I said, "The evidence is quite clear that marijuana use is a frequent predecessor of more intense drug use. But there is no evidence to indicate that there's a causal linkage between use of drugs like marijuana and getting to the point of drugs like heroin." And he was arguing with me and he listened. And it turns out that by the time we published our book,

"The Persistent Poppy," John Collins had become a good friend, clearly understood my heroin work, and wrote the preface of the book.

A: He was a good man. I liked him.

B: He was wonderful man.

A: When I came to the school I was asked to be the program manager of that Urban Dynamics Program for Urban Executives.

E: Oh! For the Urban Execs!

A: So I was working with John Collins doing that program.

E: But John was muscling all of his buddies in other cities to be sending people into the program.

A: It was a good program. It was a fun program.

E: Weren't you coming in to run the Sloan Fellows?

A; No, I came in to do the program for Senior Executives. Peter was doing the Sloan Fellows, and I was the deputy for Peter with the Sloan Fellows. That's what I was hired to do, yeah. Michael Scott Morton actually had more to do with hiring me than just about anyone else because he fired the other guy. Michael fired the guy before me who was doing the Senior Executives. Bill Cohen (???) said, "Well, you can fire him but you've got to hire somebody." So that's how I got hired.

B: Next question. When you arrived at the School, it had the label "Management." We still have the label "management" and not the label "business." And you've done some things in the health area. You were just talking about your work on drugs and you had a hospital program at one point?

E: We had a lot of things later.

B: Yeah. So I'm just trying to understand, because one of the things that has come out in some of the other interviews is while we call ourselves a School of Management, we have evolved into something that's quite similar in terms of the degrees for the group, the MBA now, to the other flagship business schools.

So it would be really interesting to understand – when you came to the school, was there an appreciation for the fact that we could be looking at nonprofits and hospitals etc.

E: No, the opening to nonprofits came about by, I would say, random interventions. It turns out… but you're skipping an important stage we can come back to, which is how we got into technology and innovation. But let me deal with what you say here. It turns out that accidentally Jack Rockart was working on hospital information systems from an IT point of

view. Jack was an IBM salesman who got his MBA from Harvard and was a really good faculty member in IT. One of the areas that he had some interest in, and in fact wrote maybe his very first academic paper on, was something to do with hospital IT. So he was doing a little bit of work in the public sector.

Glen Urban had gotten involved in doing some education modeling. How, I don't know, but he was. I was running my advanced systems dynamics application course, met an old classmate of mine who was working in MGH, got into a discussion with him, and that led me to meet the new head of Beth Israel Hospital and to decide that I was going to add a hospital project to my class that was project oriented, industrial projects oriented.

So in February of 1967 or 1968, I announced in my 15.582 class, Applications and Implementation of Industrial Dynamics, "This semester in addition to the industry projects we're going to do, we're going to do a project at Beth Israel Hospital. So we'll break into teams. Here's what our options are. How many want to be in this one, how many want to be in that one?"

A: Is that Rabkin?

E: Yeah, Mitch Rabkin. So Mitch Rabkin was six months as head of BI at the time. The guy who introduced me was one of my MIT classmates, Steve Lorch, who knew Mitch because Mitch had been chief resident of internal medicine at MGH. He had worked with him at MGH, and he said, "This is a really good guy, much better than doing a project at MGH which is crazy. Beth Israel is small and he's nice." And when I went with Lorch to go see Rabkin in January of that year, I told him I wanted to consider bringing a team of students in to do a project. He said, "What are you going to do?"

I said, "I've been in this hospital three prior times to have three children here. I don't know anything about what goes on in a hospital. So I don't know what we're going to do. We'll have to come in and try to figure out something."

He looked at me and he said, "Oh well, a team of graduate students from MIT can't hurt us that much."

So come February, we started the project. And I started doing much more work on health stuff coming out of that project.

Glen, Jack, and I started talking together about the fact that we were individually doing stuff. And we said, "You know, wouldn't it be interesting to create and co-teach a course on nonprofit modeling?" We went to our Dean, Bill Pounds, the three of us, and we said, "We'd like to create a course. We're not saying we want to be relieved of anything, we just want to do it on our own and we're going to co-teach and we'd like to teach a course on this." We had no knowledge that Bill Pounds had a sister who was a nurse, married to a doctor and about to go back to medical school. So we told Bill that we wanted to do something on health and education and Bill says, 'Why not? That ought to be a good thing." We had no courses in the school that related to the public sector until Bill said, "Fine, go ahead." The three of us co-taught for probably two years. Glen dropped out and then I pushed the health side and started really elaborating programs.

I created a course that was a parallel of the evening seminar of the Sloan Fellows. But we didn't do that, I think, until… No, we did it early. So I had this course and it was called Seminar in Health Administration. The first class, the very first time I taught it, there's some older guy sitting in the back of the room and he's asking all kinds of questions during the class.

And the model was the Sloan Fellows model—you bring in a guest speaker each class and the students have to write up essays and do something.

The end of the first class this guy comes over to me and he says, "It's clear to me what you're trying to do and it's a good idea but it's clear you need a lot of help." OK. And he introduced himself. "I'm Dr. Norman Stearns. I'm a cardiologist at Tufts and I just finished running the Tufts medical area at Boston City Hospital and I'm here on sabbatical leave."

"Really? What are you doing?"

"Well, they've given me a semester off; I decided to spend the semester here studying management."

"Oh OK." And since Norm said I needed a lot of help, I accepted that, and he and I co-taught for 16 years. He just died two months ago. I think he died of heart failure maybe, but I mean what he really died was he died of lung cancer. He had Parkinson's for a long time, was getting worse and worse and worse for a long time. But then he contracted lung cancer and he decided he didn't want to do anything about it. He said, "What am I going to do? Am I going to stretch out my life for another week? It's foolishness."

B: So during the 16 years he still had his full-time role…

E: As Associate Dean of Medicine at Tufts Med. The whole time. We did a lot of stuff together. We wrote a lot of papers together. He did a lot of innovation. He created a joint medical school/management course. You name it. He created seven different joint degree programs between Tufts Med in different fields. He had a broad vision. He had been in charge of continuing medical education as a side activity, so he was very into teaching and learning as process. And he was a very nice person. He had a lot of spunk.

B: Well, we don't have anything today that carries a medical name…

E: So what happened was we took off like bandits. In those days we had concentrations. We had a master's concentration in health, which I launched.

A: We had the health management in Sloan Fellows.

E: Right. Were you running that, or was Peter running that?

A: Later on I was. Peter was at first.

E: So I went and talked to whomever it was—Peter makes sense—into admitting 10% of the Sloan Fellows class a year, that was our target. And we said initially five doctors out of the 55 Sloan Fellows. And we took some nurses as well. But basically five was the magic number. That those five would be freed of the requirement to take international economics and instead would take health economics, which was taught in the Economics Department. And then in addition to the seminar in administration of the Sloan Fellows, on the adjacent night, scheduled explicitly for non-interference, they would take the seminar in health administration.

A: And the first woman came to that that night, right?

E: Yes and a later one married. Who did you say you went to Israel with?

A: Santagati (?) .

E: Not Santagati but close to that. There's another professor from mechanical who Mary, one of our early women…

A: Yeah, I forgot who that was. I know who you mean.

E: Also an S. It's an S she married, and she was in the program. So we had this what we called "the Sloan Fellows Health Management Executive Development" program. That was in the Sloan Fellows.

Then we launched an interdepartmental Ph.D. program with political science and economics. So it was Sloan, Political Science and Economics. We had Ph.Ds. in Health Policy and Management, and I headed that program. We launched a thing called the Laboratory for Healthcare Studies. I hired Stan Finkelstein as an assistant professor.

B: Stan is still around.

E: Stan was Director of our Laboratory for Healthcare Studies. When the Whittaker College got started, not the Whitehead, it was supposed to be the Whittaker College of Health Science and Technology. Howard Johnson was president. I was asked to make a presentation to the visiting committee from the Pew Foundation, which was discussing whether they would fund this because the Whittaker money was OK but it wasn't the key money. The key money was going to be from the Pew Foundation if they gave it. And by that time, we were big guns in the health field.

Dick Beckhard and I co-ran the Management Advancement Program of the Association of American Medical Colleges (the AAMC). And we did it for ten years starting in the early 70's I think. Ran it for ten years and we taught every dean of medicine in the country. Two-week program at Endicott House that was the one from the Dean's program.

The Dean's program then got followed by what we called the Phase II program and Phase III program in which we started working with the medical schools. Then we started working with the teaching hospitals. So we were doing a lot of health management efforts at a strategic level.

I go to make a presentation to this visitor group who is representing Pew. I walk into the room, and I suddenly realize that I know 80% of the people in the room. So I walk around the room shaking hands with all my dean ex-students. The Dean of Harvard, the Dean of Stanford, Chicago. I knew them, these were all my students. And I said, "Hey, as long as so many of you really know about us, let me forget about the slides I was going to use and talk to you differently about what would happen if you put together this proposed Whitaker institution." And I reminded them of Tom Allen's work, which we had used in the Dean's course, to talk about space and communications. And I said, "Look at the concept of this. You're going to bring together the engineers, the scientists. You're going to bring together the economists and the management people and you're going to do it in the same building. There's an opportunity here of having such an interaction of disciplines that things are going to take place here that could never have taken place before, any place in the world." And so we have this

session which goes wonderfully. Great pitch. No slides because now I was with my guys, OK? I'm at home that night, and Howard Johnson, then President of MIT, calls me at home. Howard had just finished dinner with the Pew visiting committee. They were all excited by my talk, and proposed that the Whittaker College be the Whittaker College of Health Science, Technology and Management! Howard asked, "How do you feel about that?"

I said, "Well, if they want to do that, that's fine."

He said, "What could we do to help you out?"

I said, "Help me out?"

He said, "Yes."

I said, "Well, Howard if we could have 5,000 square feet of space for our Lab for Healthcare Studies, and if we could have a place for our Ph.D. students in our growing program, that would really be nice."

Howard said, "I'm sure we can work the design of the building and the programs to accommodate that. I'll let them know that you've agreed that this is a good thing, and I think that they would probably need a paragraph, maybe two or three, that they can include in the final proposal." Great. If you go to the building and you look outside at the concrete, the concrete now says, "Whittaker College of Health Science and Technology." If you look inside at the bronze plaque with Uncas Whittaker's profile on it that was done at the dedication of the building, it says "The Whittaker College of Health Science, Technology and Management." I was one of the three Associate Directors of Whitaker – one for science, one for engineering, and me for health policy. "Management" got dropped when we closed down all of our programs after about ten years, when we basically had no internal demand in the school. Whoever was dean at the time, probably it was Abe… It must have been Abe.

B: What year?

E: I don't know. It could have been Glen. The issue was, whoever was dean called me in and said, "Come on, Ed. You got all these health courses that we're giving to students from the Harvard School of Public Health, the students from the Kennedy School. We've got hardly any Sloan School students taking our courses and it's ridiculous because we don't have any internal demand for this stuff any more."

And I said, "Yeah, you're right." So we closed everything down. The last to die was the Laboratory for Healthcare Studies because we had gotten a very big grant. Glenn Strehle was treasurer at the time, and I fought with Glenn about segregating our money so that we could be managing our money separate from the MIT portfolio. And he was reluctant. In those days they would set up separate accounts if you were special. We only were getting $2 million so he wasn't so sure we were special, but I said, "Look. They're willing to pay us up front the whole money if we undertake responsibility for management of the money because this is part of their foundation management process." "All right. All right." It afterwards became Glenn Strehle's heyday. He invested our $2 million at the peak of the bond market. Was getting 22% return on our money and consequently Stan Finkelstein got supported out of that money for years and years going on, just because the endowment had become so large on our segregated funds.

But we closed down everything. Again, if I had energy and interest—I don't have either, I have plenty of energy but I don't have any interest in it—I would restart most of those health programs today.

A: Now Rebezen (?) is talking about this stuff.

B: He's in operations management. He's got an informal group.

A: Well, he says they're doing this work at MGH on operations management in hospitals.

E: You mean he's continuing what Gabe Bitran started.

A: Right. Yeah, he's an interesting guy, this guy Rebezen. He has a list of 21 faculty in the school who are working on things related to health one way or another.

B: I've been to a couple of meetings.

A: He did a presentation the other day. It's impressive what they're doing at MGH. But as you say…

B: It's not a center yet. I mean it's just a kind of network.

A: He's working in that direction.

B: It's a network.

E: Well, organizationally what we did was I was in charge of the Technological Innovation Group, something like that. And upon the hiring of Stan Finkelstein, I changed the name of the group. The name of the group was changed to Technology and Healthcare Management Group. So when we initiated doing work to the point of an additional junior faculty member, I was legitimizing that health was an area of activity. And we weren't a center, we just had health people in our group.

I learned a lot from the efforts to try to create programs. What I learned was you can't create programs in the school with untenured faculty members who are spread around the school. And what happened was Jack Rockart didn't get tenure. The replacements in the IT area had no interest in health. We had a young accountant who was doing health costs in hospitals who was part of our group, and we had a course in healthcare cost analysis and the like. He wasn't promoted and the new person they hired had no interest in health. And so on. So it was very clear you couldn't build programmatically with junior faculty unless you were owning the faculty slots and could hire replacement people who were going to come into the same area of interest. And since we were working multidisciplinary faculty, there was no reason in particular for any of the groups to be hiring similar people when they were replacing the slot. So it became too hard to maintain the program, and we weren't getting strong Sloan interest.

But I said before, that you skipped something more important than health, which was Technology and Innovation. That came out of a pure—I don't know, what do you call it?—Bluebird. It was 1961, early in the year. Jay Stratton was President of MIT and was also chair of the National Academy of Sciences. Jim Webb had just been appointed the Director of NASA, and NASA had just been restructured. They pulled together the Army Ballistic Missiles arsenal from Huntsville and pieces of whatever were there and Jim Webb was now the new guy. Jim

Webb had a distinguished career in public service and now was head of this. Jim Webb called Jay Stratton and said he would like to talk to him about possibly creating a relationship between NASA and MIT in the area of organization and management of large-scale programs, of which the space program was going to be a pioneering example. Stratton called Howard Johnson who was Dean, said, "Howard, you go down to Washington and meet with Webb and find out what he wants. But remember, we're not going to go undertake any consulting for any government agencies." Howard went down, met with Webb. Told Webb that this was very exciting and if we did anything we would have to be doing it as research not as consulting. Webb said, "What a wonderful idea." He'd like to do that. They decided on a process. The process was, a taskforce of Sloan School faculty would be appointed as consultants to Webb for the summer and we would research whether or not NASA had appropriate researchable questions on which to build a research program at MIT. The taskforce that got appointed were: Bernie MulletThym, senior lecturer, ex-McKinsey, teaching organization and strategy in the school; Don Marquis, who had been head of psychology at Yale and Michigan where the big research centers had started. (Nobody bothered to note that Marquis didn't understand about people or organizations, but he had been department head of these great places!) and John Wynne. John Wynne was associate dean.

A: Is that how he got here, John Wynne?

B: No, John was a Sloan Fellow!

E: John was a Sloan Fellow, and became head of the Sloan Fellows program. When Howard became Dean of Sloan, Howard made John his deputy dean, associate dean for administration. And when Howard became president, John Wynne became vice-president of MIT. So…

A: John was sponsored by the Air Force I think.

E: Correct. Air Force Systems Command. So John, the three of them and me, why me? It was 1961. I was 25 years old. I was a doctoral student in the Economics Department. My doctoral dissertation on the dynamics of R&D was the only work going on in the Sloan School that had the vaguest relationship to anything to do with technology and innovation. So "the kid" got onto this task force and in June of '61 the four of us flew down to Washington to meet with Jim Webb and to kick it off. We spent the summer going all around NASA and in September we wrote a proposal to establish the Organization Research Program. That's what Marquis named it. He was the only legitimate academic in the group so that's what he named it.

It took until February of '62 before it got approved. Why? Because we asked for so much money. We asked for $580,000 for 18 months. And that was considered by Webb's staff to be so outrageous that they continuously delayed and delayed. And finally Webb said, "The hell with it. I approve it and it reports to me." So in February '62 we established the Organization Research Program which was the first research program in the Sloan School in history. There was no prior research program, We now had a center, it wasn't a center, it was a research program. Marquis was in charge. It quickly became clear that Marquis was the last person in the world who should be managing a dollar of anybody else's money. So suddenly, by then I was now a first year assistant professor. I was made associate director of this program.

You know how we treat junior faculty today? No responsibilities for anything? Right. Lots of luck. I was associate director and in particular Howard said to me, "Ed, I'm making you responsible for watching the books."

E: So what Marquis was, is Marquis was an absolutely spectacular encourager of junior people. He was, without question, one of the finest inspirers, coaches, encouragers that I've ever encountered. If you walked into his office, you would want to relate to him. He was gentle, he was warm, he was interested. Whatever it is you wanted to do, he was interested in.

He was also irresponsible in money. He was very free with money so you could…Bill Pounds will forget, probably. He funded Bill Pounds. He funded anybody that walked into his office and said, "You know what you guys are working on is interesting. I want to do this."

And Marquis would say, "Well, maybe we should give you $10,000 to take care of some summer stuff and whatever it is." So Marquis was very good that way and that wasn't entirely bad, except you ran out of budget. So we had to quickly go back and try to, and we doubled our money very quickly and then we started getting other money. But we basically started and created a group. Tom Allen heard of our group while he was in the Mechanical Engineering department on leave from Boeing, doing graduate studies. He came over, met with Marquis and heard what we were starting to do and decided he was leaving what he was doing in the Engineering School and he was moving over. And entered into a doctoral program in the Sloan School. Now the doctoral program had just started maybe a year before in the Sloan School. Anybody ever talk to you about the evolution of the doctoral program?

B: No, not that I recall.

E: I was offered the first Ph.D. in the Sloan School. I was finishing my Ph.D. in economics and Paul MacAvoy, who later left the school to go to Rochester as a faculty member. I think he eventually became Dean of Rochester. An economist who looked like a Kennedy. He had a perfect Kennedy-like Irish face. Very nice guy. He was first chair of the doctoral program. I forget who else was involved. He came to me to say that they would like me to be the first recipient of a Ph.D. from Sloan. And I said, "What are you talking about? I'm not registered in Sloan. I'm in Economics."

"Well, we can arrange for that. We'd like you to be the first Ph.D. because you're going to finish right now and that would really be great and kick off the program."

I said, "You want me to give up a Ph.D. from the most prestigious economics department in the world to take a Ph.D. from a startup activity in a place that has no academic track record at all??"

And he said, "I'm beginning to sense that you're not going to be very approving of this."

I said, "You sense right. Not in your life. I'm finishing my degree in the Economics Department."

OK. The guy who got the first degree in the Sloan School was a guy named Anderson, and Anderson wrote a thing that later became a pocket book. It was on the upheaval of the cities and the management of urban development. When the pocket book came out, the cover showed a bulldozer with a big blade turning over buildings all over the place. And I forget what the name of the book was, maybe "The Urban Bulldozer", but that was his doctoral

dissertation. And I think he later on became a strong right-wing economist with the Hoover Foundation. I don't know what he did in his career.

B: Was it Paul McAvoy?

E: Paul McAvoy, yeah. So Paul was the first chair of the Ph.D. program and Paul came to me to offer me that great opportunity which I rejected. That was '61.

We started with NASA. Tom Allen came in, entered into our Ph.D. program. Tom eventually finished his Ph.D. at Sloan and we hired him right away into our group. So he was the first hired into the Management of Technology Innovation, whatever we were called at the time. We might not have been called anything different. I don't even know what we were called. But Marquis was head of it. Marquis died very early. Marquis died I would say less than five years later. I'm sure Marquis wasn't alive when I came up for tenure. So he must have died 1965 maybe and I took over running the program then. And we went from there. But that's how we got started.

In 1964, this I remember explicitly, Don got a call from a professor of aeronautical engineering. We were the first organization research program funded by NASA. The Aerospace Department, the Aeronautics Department was the first Aerospace Research program funded by NASA at a university. So they were aerospace research center #1 and we were organization research center #1. NASA numbered sequentially the centers they funded. So this guy whom we didn't know, called Don and said he was having a political problem with NASA that he thought we might be able to help on. Could he come over and talk? So Don said sure, set up an appointment. And I went with him and we walked across campus, sat with this guy. This is '64. NASA was only three years old at most. The problem was that NASA headquarters was insisting that his research program do something relating to technology utilization and how technology coming out of NASA was going to affect mankind. And he said there's nobody in his department that would know anything about this and he thought maybe somebody in the Sloan School might be able to help.

Don and I sat with this guy and brainstormed for an hour and a half. We mentally went through the faculty of the school thinking about everybody, what kind of research they might do, and whether or not research we could imagine somebody else might do could possibly be relevant, and we struck out! We couldn't come up with an idea. So this meeting is coming to an end. We are standing to leave and apologizing that we haven't been more helpful. About to leave and I turned to him—it was in September 1964, so I was 26, and beginning my third year as a faculty member—I said, "You know, can I ask you a dumb question?"

And he says sure.

I said, "Look. Don't I understand that some people leave your labs and set up new companies?"

And he said, "Oh sure."

And I said, "Now wait a minute. If they leave your labs, don't they take with them things that they were working on while they were at the lab?"

He says, "Oh yeah, uniformly."

I said, "So I must be missing something. But isn't that an example of technology transfer? That they take the stuff they worked on on NASA programs and Air Force programs and they bring it with them when they go set up outside companies and they do things with it."

He looks at me and he says, "Yes, absolutely. That's a very good example."

I said, "Well, I don't know what I'm saying but that's interesting to me. And if you thought it was OK, I'd be willing to start a research program to study those people, what they do in setting up their companies, and in the process I'll trace the movement of technology from your labs out into the companies, to the market."

And he looks at me and says, "How much money do you need?"

Don and I take off our coats and sit down again, literally take an envelope and Don is now coaching. So Don says, "Ed, put in a month of summer salary. You'll want a couple of research assistants. You'll need $1,000 for computer time." In those days we bought batch processing. $1,000 for computer time. "Put in a little bit of travel money." We add it up and give him the total and we came to $16,900 for the first year. This was the total.

He says, "You've got the money. When you go back to your office, send me a paragraph."

OK, great. Thank you. Shake hands all around. Don and I go out. We start walking back from Mass Avenue, Building 9 or whatever, next door to the entry to MIT in the corner building. As we walk out the building, Don says, "Ed, that's a terrific idea. That's really interesting. How are you going to do this?"

I said, "Don, I don't have a clue!" I had not done any organizational research until then. I had not modeled it.

So Don laughs and he says, "Oh well, it will be a good research project anyway."

And that's how I started in entrepreneurship. I went back to my office, I sat down to write this guy a paragraph. The first thing I did was I needed a title. And I thought about it and I wrote my title. The title was "The Transfer of Defense-Space Technology to Commercial Markets via the Formation and Growth of Technology-Based New Enterprises". And I wrote two sentences and that was it. So that was 1964. And that's how I started researching entrepreneurship.

In 1963 I had started Pugh-Roberts Associates. So I now had a tiny taste of being involved in a company but we had no full-time people. We might have had our first job that we got from somebody. Jack and I were putting in our part-time consulting time on that. Or we might have had some graduate students doing work with us part time. But I already was doing entrepreneurship in that trivial sense. And beginning then I started researching entrepreneurship. So everything that followed for me in entrepreneurship started with that point in early fall of 1964.

B: That's a great story. Just one last question comes from something that Bill Pounds said. You know he spends a lot of time poking around MIT. And he's impressed at what happened in, say, engineering and to some extent science where they have to fund part of their salaries by getting grants and company funds. And it keeps them closer to some of these problems that interest funding agencies. And you have illustrated this in several ways, how you were bringing funds in and working on important problems, things that matter to practice. Bill, if he had his way, would like to have this be the methodology for the Sloan School.

E; That's how he behaved as Dean. In conversations I've had with him, he says he thinks that if he were dean today, he would be making many decisions dramatically differently than he made them then. He understands today much of what he didn't understand at all in that time period. That's what he says about himself. So I have never talked about this thing with him but that's one of his new awarenesses. When he was dean, he was very clear. He said, "We don't

get a damn thing out of you getting research funds from anybody else. The accounting differences are trivial. It's not worthwhile bothering to have you go outside. If there's something you want to do that's big, by all means go find yourself a source of money. If you only want to do regular faculty research, there's no reason whatsoever for you to have to go outside and find funds." That was his very clear attitude and policy. So, big? OK, we can't fund you. Go find a source of money. Not big? What do you want to bother getting trivial money for? What do you need to do? You buy yourself off for one semester? Foolishness. So I think there is something to the notion of, in the engineering case, they have a requirement that they do it because their budget structure is such that they need to do it. You could accomplish something similar if there were positive incentives to do it.

As it is, I think there are negative incentives to do it. I think that what people quickly learn is that they give themselves headaches by going after outside money. And this is such a negative environment for receiving money with respect to large overheads and the like, if you wanted to do an interesting side study, start with the economists and ask them, "Are you doing any research with grants that don't come into the Sloan School?" And the answer is that a bunch of them have grants coming in to NBER because NBER's overhead is next to nothing. NBER facilitates grant writing, report writing. Absolutely. So you could talk to Fiona Murray. You could talk to Scott Stern. You could talk to their pals and you would find that the flow of money to NBER includes lots of stuff that are absolutely legitimate research topics that they will write papers on, that we will gain credits for, but the money flow took place entirely outside. And it was easier, better, better helped and the like. I mean you take big money.

So a number of years ago we had this opportunity, which I followed up on, to go create a major program in the United Arab Emirates. That was very potentially controversial. Because it was so potentially controversial, Bob Brown, who was Provost, appointed a special interdisciplinary task force across MIT to look at what was the proposal and what were the potential relationships. We had a professor from Political Science. We had people from across campus. The guy who is now Deputy Provost, who used to be head of Humanities. Nice guy.

B: Phil Khoury.

E: No, no, oh yeah, Khoury! Yeah, yeah. He was on the task force. Big task force. We go through everything under the sun, they approve it. Chuck Vest calls me and says, "Ed, this is really in a way a brave step to try to do this. You really sure you're comfortable?"

I said, "Yeah, I'm comfortable."

"Fine, because I want to see if we can establish a place in the Middle East where you can really do business."

OK, fine. So we go ahead and we now are moving forward with our proposal and our proposal is going to be a five year program with Dubai, with the Minister of Higher Education and we are going to transfer entrepreneurship programming capability and the like but do it in the Sloan School way. Faculty coming here for us to train, us doing minimal amounts of stuff on a visitor basis. Nobody stationed over there. Not undertaking major programmatic stuff. Exactly the way that the school likes to do things. We're going to do all that, five years, $50 million.

E: So Dick Schmalensee and I had a deal because our calculations were that we were going to be producing, out of $50 million after the Provost took his piece, after all of the

generously budgeted expenses, our figures were that we were going to be producing something like $15 million worth of slack. Beyond funding one chair and whatever. And my deal was we basically had a more or less 50/50 split between the entreprenem (sip center and the dean's office and it would go into endowment in the school or endowment in the school but for the entrepreneurship center. OK. We go have a big conference in Dubai. Phil Clay comes with us as our lead speaker at the conference. Mahtoum (sp?) flies in, who is now the Sheik of UAE, who was then only the son of the Sheik, Zayeed was his father. He was really running the country because the father was sick. But we were delayed in kicking off our conference in the morning because the word was that they had decided to come in and attend the opening session. So we had to wait until the helicopters arrived from Abu Dhabi to Dubai.

In the meantime they were rearranging the whole conference center so that the first two rows were tall, royal chairs. And suddenly everybody is rising and a group of 50 white coated guys all come marching down, taking their positions in the front row. When everybody is now seated, the minister of higher education welcomes everybody, Your Highness and what have you. And starts the program off. Phil Clay gives the welcoming address from MIT as to whatever it is. And at the coffee break the whole entourage now leaves. And they're there. That afternoon, we are the front page of the newspaper that His Highness, Mahtoum, has blessed the presence of MIT in creating entrepreneurship for the UAE. All this kind of stuff.

That night, Phil Clay dines with him in the palace in Abu Dhabi and just Phil and His Highness discuss the MIT proposal. His Highness says, "This must go forward," and shakes hands with Clay on the deal. Does one need anything more from a ruler in the Middle East? $50 million bucks, five years, MIT. OK.

That's May. The proposal from MIT gets through sponsored research and sent to the UAE at the end of September. The proposal has no specific tasks outlined in it. It has a series of one-line payment schedules allocated into categories as to what will be paid quarterly over a five-year period of time. That's what the UAE gets from MIT. They are appropriately offended, massively. They wait three months before responding to us that they've been re-thinking their notion and have decided that this is perhaps not the right thing for them to be initiating.

Now that's an extreme example of how it's hard to do business at MIT related to getting sponsored research, or in this case, sponsored education. Just 10% overhead and the like.

B: Who was driving? What faculty member?

E: Me! Me! Schmalensee would not allow me to go over his head.

I said, "Hey, come on, Dick. Chuck Vest called me and said if I'm uncomfortable, I call him and the deal is off. That it was important. This is my proposal. I know how to go around the research office. I'll just go to the President."

"No! I don't want you to do that."

B: So who edited out all the content of what you were going to do?

E: The research office was busy deciding that if they put in our content, it could be interpreted by the Navy auditors as fee for service and that therefore it would have to come under our regular overhead structures and that therefore we would need an overhead recovery and this was a $50 million proposal and the overhead recovery was totally out of line with anything that

MIT would ever allow in terms of subsidizing the full recovery of overhead. And there was no way that this could be undertaken as an educational program in their interpretation.

Now even Donna Behmer—EVEN Donna Behmer—would have seen that yes, it could be done as education. That if there's any question you just make sure you write the right words about this that and the other thing, and it's clear education. I mean, we were educating them here. We were doing a little bit of education there. But anyway, that was it. That ended our episode of doing stuff with Dubai. We had one more small conference that we ran the next year and then after that Ken Morse did a lot of personal consulting, but no more activity.

That was before Abu Dhabi came in with this big whatever it is with _____ that is MIT related to some engineering school being created in Abu Dhabi. So MIT doesn't readily facilitate it. And the Sloan School, the attitudes for a long time have been pretty… not anti-research, anti research funding. So I don't know. If you were dean and you wanted more research rather than just you wanted research because you wanted involvement.

B: I think Bill's thinking it's research that is maybe a little more related to interesting problems. I think his feeling is that when faculty had its salary covered, they could go off and work on exciting things and it doesn't have enough connection to practice or policy.

E: So you know Bill's been going to seminars in the physics department.

B: Yes, he has.

E: And he's given them money. I am on the mailing list because of my donations to MIT. I now get mailings from every department at MIT, basically I get all their resource development mailings. So the resource development mailings for the School of Science, the most recent one, is a picture of Bill Pounds and the Dean of Science shaking hands and smiling because Pounds made a contribution to a special fund for the Dean to be able to fund innovative projects in the Dean's office, coming out of the Dean's office.

Bill is quoted in that thing, and I chatted with him afterwards. He said that the biggest shortage to a Dean is having open money that he can take new projects that are interesting and kick them off. So he said a seed fund for new projects is what he thought would be good for the School of Science. He sits in on the TIES seminars almost every week. The other day I showed up late for the seminar because I had appointments. So Bill was sitting there talking to some guy, and I came in and Bill says, "Hey Ed, you're the right guy for me to talk to."

I said, "Sure! What's the issue?"

He said, "These things vary all over the lot. Is there a central theme here?"

I said, "No. It is TIES, it's innovation, entrepreneurship and strategy. The seminar deliberately is inclusive, not thematic."

He said, "Yeah, but it's hard to see a common thread."

I said, "Absolutely. It's satisfying everyone's individual agenda. It's satisfying the different elements in the group by bringing in outsiders who are covering different topics."

He says, "Well, I don't know." And then he switched onto strategy because the speaker was… do you remember Sarah Kaplan? Sarah Kaplan was a Ph.D. student under Rebecca Henderson and she now has tenure at the Rothman School in Toronto. She went from Sloan to Wharton and was at Wharton untenured. And then I don't know whether she didn't get

it or wasn't going to get tenure, but she ended up going to Rothman three years ago as associate professor.

So she gave a seminar and Bill said, "She was interesting."

I said, "Bill, she had worked at McKinsey for a number of years before she came here as a doctoral student. When she came in, she wrote better than everybody else. She talked better than everybody else. She was far more clearly focused on big, organizational direction, strategy, questions than anybody else was, including her chair who was Rebecca." She wasn't analytically trained when she came in, except in McKinsey analytics. And when she was a doctoral student she learned a hell of a lot. She became academically rigorous. She now knows how to do academic research and publish it and the like so it doesn't surprise me that you say that she came across as being really solid.

He says, "Yeah. She was. I liked her." And then he said, 'I don't know. This whole strategy field is weird. Is there really a field for strategy?"

I said, "Well, wait a minute. Your mentor Ned Bowman invented the field at Sloan."

And he said, "Yeah, that's right."

I said, "You recall."

Now Bob, did he tell you that? Did he tell you how Ned Bowman decided to leave production and operations management and to become our first new kind of faculty member in strategy?

B: No, we did not cover it.

E: See, this is my memory. Almost the same time, a little later, Arnoldo Hax moved from management science where he was our manufacturing guru and moved into strategy. Right. Prior to that we didn't have strategy. We had policy. I think we had a guy named Christensen, not Clay Christensen but I think we had a guy named Christensen who taught corporate policy.

I remember when I was still an undergraduate and when I became a faculty member we had a guy named Holder Hudgins. And I have no idea if Holder Hudgins had any academic background at all. But Holder Hudgins taught corporate policy and whatever. Holder Hudgins was clearly old school. I remember black three-piece suits, which were very characteristic of this place.

When I was an undergraduate, we belittled our fraternity brothers who were registered in Course 15 because they had to wear jackets and ties. That was the requirement of the guru, the one who was department head, Erwin Schell. That was an Irwin Schell requirement. That if you are going to study management, you must look the role. And Holder Hudgins was a stereotype of what one would think was somebody who was management. Black suit, three piece, vest and what have you. He taught corporate strategy.

I'm sure it wasn't strategy. Something like policy, which was like the Harvard Business School's first year business policy course, that was the required course at the Harvard Business School until it got thrown out and the substitute at the Harvard Business School eight years ago was entrepreneurial management. Harvard Business School, not MIT Sloan School. Now entrepreneurial management meant something different than entrepreneurship.

B: Is that what you did with Dick Rosenbloom?

E: No, Dick Rosenbloom had already stepped over, or stepped on.

B: You did something with him on technology didn't you?

E: Yeah. Dick was the David Sarnoff professor and I was the David Sarnoff professor. And RCA required that the Sarnoff professors collaborate. So our deal, which RCA had accepted, which I negotiated with an associate dean of the Harvard Business School and the grants person from RCA. They wanted us to do joint everything and Harvard and MIT agreed we wanted to do as little together as possible. Our agreement was that one semester a year we would have a joint course, jointly taught by the Sarnoff professors. It would have 50/50 students from HBS and from Sloan. And we would rotate the location of the course between the two schools.

The first year Dick Rosebloom was appointed the Sarnoff professor. Don Marquis was appointed the Sarnoff professor, and the agreement was they would switch every week. OK? That each week it would be in the other location. That's how they approached it the first year. And Don Marquis died the first month of that course. And Dick Rosenbloom ran the course by himself with a tiny bit of help from me for the rest of the semester for the very first time. By the second year I was not yet appointed Sarnoff professor but I agreed I would co-teach the course with Dick. And we now agreed we're going to be a little bit more sensible. We'll switch places each year. So that the next year we said, "Because of ease, since we weren't sure of what was going to happen with the chair, since I wasn't picked, we'll go do it at Harvard and that will be easy, but he and I will co-teach." And by the next year, maybe, I was given the chair. That might be right. It might have taken about a year and a half before I was given the chair.

Jerry Wiesner was president. Jerry Weisner knew David Sarnoff. And Jerry Weisner didn't like me. Why, I don't know because I don't think I ever had anything to do with him. But maybe I did, I don't know. But Jerry Wiesner…

Note: Interview concluded because tape ran out, and people had talked longer than planned and needed to leave.