

An Interview with
JAMES BIRKENSTOCK

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Conducted by Roger Stuewer and Erwin Tomash

on

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Abstract

From his perspective as advisor to the president and subsequently as Director of Product Planning and Market Analysis at IBM, Birkenstock discusses the metamorphosis of the company from leader of the tabulating machine industry to leader of the data processing industry. He describes his involvement with magnetic tape development in 1947, the involvement of IBM in the Korean War, the development of the Defense Calculator and the 701 computer, and the emergence of magnetic core memory from the SAGE project. He then recounts the entry of IBM into the commercial computer market with the 702. The end of the interview concerns IBM's relationship with other early entrants in the international computer industry, including litigation with Sperry Rand, its cross-licensing agreements,

and cooperation with Japanese electronics firms.

JAMES BIRKENSTOCK INTERVIEW

DATE: 12 August 1980

INTERVIEWERS: Roger Stuewer and Erwin Tomash

LOCATION: Stamford, Connecticut

TOMASH: This is August 12, and Roger Stuewer and Erwin Tomash are here with Jim Birkenstock to talk a little bit about the early days of the computer industry.

STUEWER: I think that you should state that we will be supplying a transcript of this interview to you, Jim, for your review and comments, and that you really have full control over the contents and the disposition of the transcript. That's always part of the arrangement.

BIRKENSTOCK: Thank you very much.

TOMASH: I don't know if you have a thought of where you'd like to start, Jim. If not, I think it would be informative to just start with when and what kind of computing first emerged on your personal horizon.

BIRKENSTOCK: Well, my recollection of my first involvement with what, in those days, was called "tape processing machinery" was relative to the conclusions reached by a task force of about 18 men assembled by the IBM company to evaluate magnetic tape as a medium for data processing.

STUEWER: What was the approximate date?

BIRKENSTOCK: The approximate date was in the fall of 1947.

TOMASH: And when you mention tape, you mean magnetic tape?

BIRKENSTOCK: At that particular time magnetic tape was not plastic based. My recollection was that Univac had a magnetic steel tape. And it was my role as Manager of the Future Demands Department, rather newly appointed to that assignment at IBM, to evaluate the results of this study. The results were, as I recollect, that there was about a vote of 14 to 4 by the task force group that evaluated the engineering development. 14 to 4 against any commercial feasibility.

I was a doubting Thomas as an evaluator of the results of the task force as to the validity of this conclusion. Also, in my role as Manager of Future Demands, and later as Assistant to the President of IBM, Tom Watson, Jr., it was my responsibility to keep abreast somewhat and keep watch on what our competition was doing. And I was therefore both mindful of the progress that was being made by Eckert and Mauchly in the ENIAC program and the BINAC program, and others, and believed that electronic computers had commercial feasibility and that they would be a competitive threat to IBM's tabulating machine business, as it was called in those days--electric accounting machines.

My perusal of competitive developments was intensified as time went on and I had the support of my boss, Tom Watson, Jr., who shared my concern. We both felt that a new era of technology applicable to the IBM business was dawning. It was the era of electronics. Tom Watson, Jr. took a leadership role in the company of seeing to it that the IBM engineering force was transformed from an electro-mechanical engineering--R & D effort, to electronics. He made the command decision and the directive that a certain percentage of our R & D hirees have doctor's degrees in electronics. Thereby IBM began to build a high order of electronic capability.

TOMASH: You were saying that the transformation of the engineering process received the attention of Tom Watson, Jr.

STUEWER: And that a specific decision had been made to hire a certain percentage of Ph.D.'s in electronics.

BIRKENSTOCK: That is right, and as this program gained momentum in IBM, there was a corresponding capability developing along the lines of enhancing the electronic development of the tape processing machine, which was of course a significant successor to the SSEC (Selectronic Sequence Electronic Computer). In parallel IBM was developing the NORC (Naval Ordnance Research Computer) program done by these now emerging electronic scientists, and there was developing at that time a bit of rivalry within the IBM company between the electronic scientists and the electro-mechanical scientists hired in a different era.

We're now in the time frame of 1950. IBM had made some significant strides in building its electronic R & D work-force. And the Korean War erupted. Because of this Mr. Watson, Sr., made the decision that an IBM effort should be reactivated along military products lines, an operation that had been dissipated following World War II during which IBM had made some significant contributions of an armament nature. I was assigned in mid-1950, by Mr. Watson, Sr., at that time Chairman of the Board of IBM, to organize a military products division of the company for the purpose of serving our government with products useful to our nation in a military sense.

At that time, Mr. Watson's son Tom saw this as an opportunity for IBM to become involved with the government agencies as a supplier of special purpose electronic computers. So he asked me, as I proceeded to negotiate contracts with the government, to build and organize a military products division of IBM, with emphasis on electronic computers and to see if we could not undertake to develop special-purpose electronic computers for various government agencies. So I set about on this assignment, conferring with the engineering side of the IBM house, particularly the new cadre of electronic engineers that had been brought in, which under Wally McDowell was led by Ralph Palmer, Jerry Haddad, and Nat Rochester; and there were a number of other prominent IBM engineers; Charlie Bashe was also involved. By Havens from the NORC program played a role. We first set out to ascertain how many special purpose electronic computers we were capable of building for the government. And it was concluded that we had the R & D resources to do about four such projects.

So the next part of my assignment was to go out and determine where we would find sponsoring agencies within the government for such four special purpose computers, and to ascertain this I enlisted the aid of Dr. Cuthbert Hurd who was the director, I think at that point in time, of the IBM Applied Science Department. He was a very competent, very astute individual from the standpoint of ascertaining what the scientific computational requirements were out in the field; what the prospective customer would require in the form of a product to satisfy particularly their scientific computation requirements.

So, Hurd and I set out to visit many government agencies. My recollection is that we visited throughout the United States some 22 government agencies, all the way from the just then emerging facility that later became Cape Canaveral, to Los Alamos, and many of the other facilities.

As we assessed the requirements of these prospective customers for electronic computers, it began to dawn upon us that to attempt to solve the total requirements of a particular government agency by means of a special purpose computer was the wrong approach--that of the agencies that we visited there were almost all--maybe 90% of their scientific computing requirement--had a great deal of similarity.

STUEWER: Across the agencies.

BIRKENSTOCK: Yes--across the agencies. And therefore it would be far more productive for both the prospective users and for IBM if we could achieve a computer design that would satisfy the majority of the scientific computing requirements of these agencies, not totally satisfying the requirements of any agency. This would be in our judgement a greater contribution to national defense. It was also our opinion that we should not be thinking about an engineering model of a computer that would satisfy the total requirements of a specific designated agency or prospective customer, but we should consider building a production lot of a computer designed to fulfill not all the requirements--but most of the requirements, or shall I say a majority of the requirements--of the customer community

that was serving the government as a defense contractor; and those customers who were government agencies or departments.

STUEWER: Do any particular visits stand out in your mind among these 22 agencies as being most important in leading you to this conclusion? Or can you give us some background or insight into the military personnel that you were talking with that led to the interplay that led you to this particular conclusion?

BIRKENSTOCK: Well, it would be hard for me to really designate at this point one agency over the other. Los Alamos was important as was Aberdeen and Naval Research Labs. I also remember Wright Field as important, Monsanto as a contractor to the government, and Boeing, and so fourth. They were all important. I don't think one stood out particularly predominant at that point in time. By now we realize that it would probably be more productive for the IBM company, best for its customers and a greater contribution to the Korean War effort - the military threat at that particular time - if IBM were to produce a production lot of electronic computers rather than several special purpose computers. We explored this with Ralph Palmer and the people in Poughkeepsie to see what they could do relative to devising systems architecture that would satisfy the majority of the computational requirements that we saw in the field. Dr. Hurd because he was much more capable than I of ascertaining systems requirements of a scientific computing nature worked closely with the Palmer group and they came forth with a design, a block diagram, and cost estimate. If my recollection serves accurately, they estimated that \$3 million would be required to produce a production model of a scientific computer which we called the Defense Calculator. It was called the Defense Calculator for political reasons, really, to fit the assignment that Hurd and I were given to recommend a program involving electronic computers that would be contributory to the war effort. Politically also, we were not intruding on the major product planning effort of IBM that was at that time electro-mechanical oriented and had a wide cadre of support within IBM. The majority opinion was that the IBM future was best served this way rather than the electronic way. So we chose that name, Defense Calculator to gain support in IBM and to take the political path of least resistance. Dr. Hurd and I sold Tom Watson on the program of building 20 production models to this block design.

TOMASH: This was Tom, Jr.?

BIRKENSTOCK: Yes, Tom, Jr. He was successful in winning the support of his father, particularly because the proposed project was a defense project. Now the question was: would the proposed computer be accepted in the field--could it be sold? So we proceeded next to take the engineering block diagrams and the cost estimates through the IBM finance department and priced a machine that IBM had never built--that really wasn't completely designed. Now having a price, the question was whether or not our concept was marketable in the field.

So Dr. Hurd and I took the block diagram of the machine and the price which was established for it--\$8,000 a month rental--to the various government agencies and government contractors to see the degree of interest that they might have in leasing such a machine. We were delighted and amazed at the reception that the program received in the field and Dr. Hurd and I came back after visiting these prospective customers with letters of intent sufficient to justify production of the Defense Calculator. Having proved our point that the field was ready for such a machine with such a capability, Tom Watson, Jr. authorized the production of it on a crash basis in IBM. And this program proceeded under the individuals I previously named and it was about a year after IBM embarked on this program that we came to realize how little we knew about the cost and the intricacies of building a production electronic computer. Perhaps a year later IBM reached a point where if we continued as planned, the program would be a financial disaster for the IBM Company.

STUEWER: The \$8,000 a month was completely inadequate to meet the costs of production?

BIRKENSTOCK: Totally inadequate. So Hurd and I had to put on our traveling clothes and go back into the field and acquaint the customers that had signed up, or prospects that had given us a letter of intent on this machine, to the fact that IBM couldn't produce the machine for a \$8,000 monthly rental and that the new rental price would be just double--\$16,000 a month.

To my recollection, all but one or two reconfirmed their original letter of intent. It's tough for me to dredge up exactly who dropped out, but almost all of the customers or prospective users of such machines stayed with the program. So the program stayed alive. Before the machine was actually delivered it became politically feasible for us to drop the name of Defense Calculator and rename it the 701. It was first produced with Williams Tube memory otherwise known as electrostatic storage. Later most of the machines were retro fitted with IBM magnetic core storage.

All of what I have described was a precursor to the IBM Military Products Division, a division formed 1955. Prior to 1952 the IBM Company began to see great potential for the Defense Calculator, and renamed it the 701 and therefore it never really became a part of the Military Products Division although it was an outgrowth of the early military products effort. In this same time frame another important activity was a relationship with MIT under the Project Lincoln. The Project Lincoln group was looking for a collaborator capable of putting an air defense calculator design--sometimes referred to as the Valley Project--into production. IBM became the successful bidder and was awarded a contract for the program, later renamed Project SAGE. IBM proceeded in parallel with the 701 and the SAGE computer, which had different engineering concepts in it than the 701. One of the beneficial fall-outs from the SAGE program was magnetic core storage. Due to our experience with it in the SAGE program we were able to rapidly retrofit magnetic core storage into the 701 as a substitute for electrostatic storage. Having enjoyed what we thought in IBM was a significant achievement of successfully putting an electronic computer into production, namely the 701 scientific computer based on the binary concepts, we immediately started working on the commercial, or the decimal digital version of the machine to satisfy the requirements of prospective commercial customers rather than the scientific customers or prospects out in the field.

And we were listening attentively to people like Dr. Brown. I think he's now at Cal Tech.

STUEWER: That's Harrison Brown, is it?

TOMASH: Maybe George Brown.

BIRKENSTOCK: George Brown. He was associated with Louis Ridenouer.

TOMASH: He's on our Board. He's at Irvine, University of California. He was--at Rand Corporation; he was the first head of the Rand Corporation computing effort.

BIRKENSTOCK: That is right. Also at that time. We were listening to Mr. Madden, the actuary at Metropolitan Life Insurance, and others out in the field, at the customer level, who said, "Yes, we have a requirement for a machine of this power to do actuarial work; to do large scale accounting programs and statistical programs, as well."

So then IBM embarked on its production of the commercial version called the 702. And at this particular juncture in time, I don't know whether you want--I don't want to make this a personal history--?

STUEWER: I think it should be--as personal as possible, actually.

BIRKENSTOCK: Near the conclusion of the assignment given me by Tom Watson of getting IBM involved in the military effort, Tom, Jr. asked me to turn my direction toward figuring out how IBM came so near to missing the boat on the electronic computing field. What went wrong with our task force which evaluated the IBM? How could they possibly have overlooked the market potential for the electronic computer, these 18 men who comprised the evaluating "task force" voted as I recollect 14 to 4 against the commercial feasibility of electronics.

Early in the study of what happened, I concluded that really it was the lack of professionalism on the part of the evaluators, the fact that they were basically salesmen who were pulled out temporarily from their field assignment, and not having the proper credentials and experience to really do a--truly creditable market analysis job and a product planning effort based on both present and future market requirements. I suggested to Tom Watson, Jr. that what

IBM needed was professionalism in this area and we ought to organize a product planning and market analysis effort across the board for the IBM Corporation.

TOMASH: Do you remember the time?

BIRKENSTOCK: This was 1953. The 701 and the start of the 702 project was in the time frame of December 1950 up to 1953--mid-1953.

TOMASH: Jim, may I interrupt you now--so when you mention the commercial version, you have in mind the 702.

BIRKENSTOCK: That's right.

TOMASH: On the tape you mis-spoke it when you called it the 701. This is the first time we've mentioned the 702, but really that will correct itself when we edit it. I just wanted to be sure.

BIRKENSTOCK: The recommendation that was forthcoming from this one-man study of what IBM needed to be able to meet the requirements of the future was that we develop professionalism and a sophisticated across-the-board product planning and market analysis department of IBM. IBM was now still a highly centralized company. It had just begun to experiment with some divisionalization.

Mr. Watson, Jr., liked the organizational concept of dedicated people assigned to product planning and market analysis independent of engineering; he approved of the concept of our going out and hiring experienced professionals for this purpose. Having accepted the concept he said, "Well, this is your recommendation and your idea. I support it. Now I want you to implement it." So I became the first Director of Product Planning and Market Analysis in the IBM company, and organized this department for the purpose that I outlined, and from that point on, that department worked in parallel and in harmony with the engineering people to better pinpoint what the field

needed and what the market was for proposed products. This new department in IBM functioned well until late 1956. And in this period of '53 to '56 I remember some of the significant programs that were planned and developed such as the Airline Reservations System; It became Project SABRE, for American Airlines. The RAMAC Project--Random Access Memory Accounting. This development was done in the West Coast laboratory of IBM. The planning was done by the Product Planning and Market Analysis people to satisfy some of the requirements of the wholesale grocery field to give us in-line processing capability to supplement batch processing capability, a need pinpointed by our Product Planning and Market Analysis requirement studies. This department survived until mid or late 1956, or until IBM undertook a massive re-organization.

STUEWER: During the time 1953 to 1956, your division must have been in almost constant conflict with the electro-mechanical people. Was it--or-?-

BIRKENSTOCK: Not really because this division had cognizance over the electro-mechanical development as well as the electronic development. It, as I tried to describe--it was really a staff function, although we were not yet on a line staff basis. It was a department that cut across the entire corporation. The responsibility for product planning and market analysis encompassed electric accounting machines and electronic data processing, electric typewriter, the time equipment development programs. We did the product planning and market analysis for all of the product development areas within the IBM company.

STUEWER: So you didn't--I perhaps drew an incorrect inference then, that the analysis didn't reveal that the electro-mechanical arm was in fact in a decreasing market situation.

BIRKENSTOCK: Not at all. The electro-mechanical arm--its market requirements and its market opportunities were growing and proliferating as well as--in parallel with the electronic, and we also saw the relationship between the electro-mechanical or the tabulating machine equipment from the standpoint of supplying the peripherals necessary to make the electronic computing-data processing market still more successful. We were able to visualize that even in

those days, I recall, that the peripherals in support of the main frame, the printers, the card-readers, the tape drives, the disk files, and many of the other peripherals would have a market potential equal to or greater than the market potential of the computer mainframe. And therefore, one of the strengths of the IBM Company was to harmonize and develop from a total systems architecture point of view--the electro-mechanical capability in harmony with the electronic capability of the newly emerging electronic engineering resources of IBM. All of this took product planning to develop products to a market requirement instead of building engineering curiosities looking for problems to solve.

STUEWER: And was this a major impetus, or maybe the major impetus for the re-organization then of IBM in 1956?

BIRKENSTOCK: Well, I don't think we thought about it that way. I think it pretty much evolved along the lines that I have described. But then as this evolved and as time went on, Tom Watson began to realize, IBM was not structured properly to adequately meet the future, so along about 1955 he brought Booz Allen & Hamilton in to look at the IBM organization structure. And they came forth with a recommendation that IBM become de-centralized and divisionalized; that the highly centralized control was not the best organization concept under which IBM could meet its future. And these--the Booz Allen & Hamilton recommendations--were adopted in mid-1956.

TAPE 1/SIDE 2

STUEWER: ...and unavoidable I think, and it's only, as Erwin says, through other interviews as well that some of the people that don't pop into your mind immediately will pop into other people's minds, and so a more complete picture will emerge. That's just part and parcel of the attempt to do an oral history.

TOMASH: And I'd like to encourage you at this first pass particularly not to worry about the names...later a name will pop into your head and you can just insert it in the transcript if you want to. The important thing is this stream of consciousness or some of these things you haven't thought about for a long time and to just get them out.

BIRKENSTOCK: Well, the thought came up--what we were referring to at the coffee break here--that some of this recital sounds rather egotistic and I don't mean it to be that way because it sounds as though this was one man's concept, result and success. And it isn't, intended, because during this time frame of really '48 in particular, or 1950, appropriately through most of '56, it was always a team effort. I worked with and enjoyed the collaboration and support of many individuals in IBM. On the Military Products side that I described in the period of 1950 through 1953, I had the able assistance of fellows like Ed Zollinger who's no longer living, Phil Coulter, Paul Whittaker, Glen Solomon who were a part of a small team and staff that assisted me in these programs, and of course, the very able and complete support of Dr. Hurd who headed up the Applied Science area of IBM, and Paul Knaplund and other key people on Hurd's staff were readily available to me. Almost anybody, organizationally speaking, was available because I was functioning as an arm of the President's office and as such I was given the support needed to accomplish the missions and objectives set forth by the office of the IBM President. And now I think at the coffee break just before, I mentioned that in the period of 1955 through mid-56 Booz Allen & Hamilton was conducting a study for the purpose of recommending a reorganization of the company. They presented their reorganization plan in mid-1956 and it was a far-reaching decentralization of the IBM company, setting up new divisions of the company to better address the opportunities of the future. Under the plan IBM set up a new division to handle both large scale computers, mid-size computers, and also tabulating machine equipment. There was also of course, the typewriter market where the possibilities of embryonic word- processing systems was beginning to emerge, and the time-recording market which subsequently IBM went out of by divesting itself of its TE Division in 1958.

Booz Allen recommended a line and staff concept with, and to a limited degree, autonomous divisionalization. All operations had the overview of a very strong staff responsible to the Executive V.P. of the IBM company--Mr. AL Williams.

At that particular point in time, it was only logical that the Product Planning and Market Analysis be divisionalized, and that each division create its own Product Planning and Market Analysis arm, and that the concept of centralized

Product Planning and Market Analysis under which I had been operating would be disbanded. I was in complete agreement with the Booz Allen & Hamilton report and recommendations proceeded to help in the implementation of a decentralized Product Planning and Market Analysis function in the IBM company.

At that particular time I had somewhat the right of election as to which direction I personally would go--whether I would continue in product planning and market analysis, heading up such an effort for one of the principal divisions of the company, or whether I would undertake to carry other responsibilities as a staff officer of the IBM company under the now-favored line and staff concept. I might say that even when I was director of Product Planning and Market Analysis I had other responsibilities of a staff related nature, such as being the executive responsible for IBM patent operations, for protection of IBM industrial and intellectual property, for IBM negotiations with other companies within the industry, for the implementation of IBM's open patent licensing program as prescribed under the IBM consent decree.

TOMASH: Were you involved with the policies that came out of that? Did you help formulate that consent decree from a business point of view--what IBM agreed to in that '56 consent decree?

BIRKENSTOCK: Yes. I worked on the consent decree and was directly involved in the settlement of the Sperry Rand litigation. The staff functions retained by me after Product Planning and Market Analysis, was decentralized were named Commercial Development. They encompassed, as I have previously said, the protection of IBM intellectual and industrial property, the technology transfer that began to emerge with the signing of the consent decree on January 23, 1956. And because of the relationship I had established within the industry in connection with administering IBM's patent operations and patent licensing program, I evolved into the role of the negotiator for the IBM company particularly with the emerging data processing industry. It was due to the contacts I had developed in this phase of the activity, that the company assigned to me the negotiation of the settlement of the anti-trust suit that was filed by the Sperry Rand Company against IBM prior to the settlement of the government suit against IBM. And in the period following the settlement of the government suit, in January of 1956, we were able to have successful negotiate and conclude an agreement with Frank McNamara and Harry Vickers of the Sperry Rand Company to

terminate the litigation. We reached agreement during the late summer of 1956 for a comprehensive settlement of the litigation including patent cross-licensing and some technological transfer and exchange between the two corporations relating to both the tabulating machine and the electronic data processing fields.

Out of this grew a sense of responsibility as to how IBM would conduct itself under a consent decree and under the Sperry Rand-IBM settlement. We had to be very careful to be absolutely impartial and non-discriminatory between the competitors that were beginning to develop in the emerging data processing field and who were desirous of having access to a license under IBM patents. It also was the beginning of an era where IBM was no longer self-sufficient in its own right under its patents as it had been in the tabulating machine era. Therefore, we had to recognize that others, both domestic and foreign, were contributing heavily to the newly and rapidly developing field of electronic computing and that if we were not careful, we would find ourselves locked out by the patents that they held on certain key developments, by the way of example, magnetic cores. The magnetic cores that IBM initially adopted came out of the SAGE program. SAGE pointed us in the direction of commercial feasibility. The first core storage I believe was used and adapted to the 701 computer.

STUEWER: The SAGE program was the program with MIT?

BIRKENSTOCK: Yes.

STUEWER: Who were the people who were the central people from the MIT side that were involved with IBM?

BIRKENSTOCK: Al Hill, Jay Forester, Norm Taylor were some that come quickly to my recollection. There were others; the current chairman of Digital Equipment--Olson, Ken Olson. Bob Everett, yes. And so forth. We saw the commercial feasibility--the engineers did, and the product planners did--of the magnetic core. The problem was that the magnetic core of that era was dominated by General Ceramics. When we went to General Ceramics for a patent license under that core because we saw that it was going to be so central to the structure of the electronic

computer--really the heart. We felt we could not be 100% dependent on a single vendor--that we'd be at a disadvantage if we were totally captivated and controlled by the storage technology of a single company--so we sought a license which would give us the right to produce part of the IBM requirement as well as being supplied by the General Ceramics company, the sole source under the SAGE program. Our request for a license was refused. We could not make a deal. So then we had to look for other areas of technology. Through our Patent Watch system, which we had implemented in IBM to give us competitive intelligence at an early stage as to what was happening out in the world--the technical world--that would impact our business or opportunize our business, we discovered that there was a development in Holland under the Philips Company that had the potential--of a different core formulation--had the potential of being developed into a successful core-memory core. And we went out to the Philips Company to seek a license, and to evolve a relationship which would remove the impediment of a dominant control of a single company over a critical item to the future of electronic computing.

We were able to negotiate a successful cross-licensing arrangement. We had the weakness of a lack of know-how on the composition of the core in IBM; we had the strength of a core testing program that evolved, out of the SAGE core program. So we traded the core test technology and related know-how to the Philips Company who lacked it in exchange for their know-how and a patent license under their magnet core composition patents. This was a wonderful quid pro quo. It solved Philips' problems because they wanted to get into the core memory business and wanted to be a vendor to the emerging computer industry in the United States and in Europe. This was the beginning of many such collaborations and technology exchanges and cross patent licensing agreements as we moved forward in the development of the electronic computer in IBM.

TOMASH: Jim, I'm particularly interested in the...core for another reason. Does the name come to mind of who would know the story of the development of that core test equipment within IBM?

BIRKENSTOCK: Well, maybe Ed Garvey would. I just can't-?-

TOMASH: Okay. I can ask Charlie Bashe.

BIRKENSTOCK: Charlie Bashe would; Ralph Palmer would recognize this. Nat Rochester probably would. Steve Dunwell would.

TOMASH: Okay, that's enough. I don't mean to get you off. It's an interesting subject in its own right, and--this infrastructure that makes a basic invention become practical. Not the invention, but all this other stuff that's needed to make that happen.

BIRKENSTOCK: While we're in that vein, I can elaborate with another very interesting area of development of a media that played a vital role, if you wish, in electronic computing. And that's the magnetic tape.

STUEWER: I just wanted to ask you before we go on to this about Philips. And who again were the principal people from the Philips side involved in this? Was this the first time that IBM had gone out of the country, as it were? Was Casimir, for example, involved in the Philips development at this point?

BIRKENSTOCK: Dr. Casimir was, but not as much as Theo Thrupp and a man by the name of Schweers.

TOMASH: That's the name I was trying to think of. He was the co-manager-- became the co-manager of computers, and he was a rotund little guy. He was quite a...

BIRKENSTOCK: And...Spikerman from a contractual side of Philips. In the United States we dealt with an attorney by the name of Russ Pelton whom Philips relied on because we were seeking world-wide rights under Philips' inventions and Philips in this country was handled under the Hartford Trust, set up during World War II to protect the U.S. Philips interests, The Trust had an assumed degree of autonomy although those who represented it were receiving very direct guidance from Eindhoven.

TOMASH: I think the example of the tape, which I've heard a few pieces of, but not enough--I think that would be great and it relates to 3M and it's an interesting study.

BIRKENSTOCK: Well, the tape emerged in the following manner. In the very early days of electronic computing IBM engineers saw the desirability of enhancing the magnetic tape used for audio applications. What was needed was the development of an audio tape into a computer tape, of high reliability and error-free characteristics.

TOMASH: Just to interrupt for a second--they're both magnetic. It's whether it's a plastic medium or a steel medium. They're both magnetic tapes.

BIRKENSTOCK: Absolutely.

TOMASH: But--just so we all know and so that you understand the problem then is --could they make the magnetic tape uniform enough, of a quality enough. Audio tape has drop-outs when you come to record the bits, you'd miss them. Steel tape also had drop-outs but they could mark that by physically punching holes in it or something. If you punched holes in a plastic tape it would pull apart.

BIRKENSTOCK: So the engineers discerned all of these things that Erv just recited and--the desirability of a cellulose base substrate became evident. Probably the only people at that time, or the people with for sure the highest degree of capability in that field of cellulose base magnetic tape was the 3M Company. It was decided that we should establish a cooperative and a collaborative arrangement with the 3M Company who knew little about electronic computers at that point in time, and the IBM Company that knew very little about the black magic of making a cellulose base magnetic tape for computers.

T. Vincent Learson--who by this time had emerged as the principal IBM executive designated to coordinate the new 701-702 programs from a total management viewpoint--marketing as well as engineering. He became the executive in

IBM that was given the full thrust of responsibility for these programs. Vin Learson and Tom Watson Jr. went out to see 3M and to initiate a discussion as to whether 3M would be willing to embark upon a collaborative program between the two companies to evolve a successful magnetic tape for computers (and when I refer to magnetic tape now, it's entirely a cellulose base tape). It was agreed at this point that 3M and IBM would begin a collaborative effort. Since it was in my area of responsibility to arrange the contractual and technology transfer related to such a program and enter into the contractual obligations with this potential supplier, I was asked by IBM management to oversee this procurement program.

From the 3M side they arranged for a task force from 3M to study in detail the requirements imposed by the IBM tape drives on the magnetic tape, and thus evolved a fine and successful working relationship that enabled 3M to produce the tape. IBM marketed in these early days, the 3M supplied tape as a branded IBM product marketed under an IBM trademark. IBM's collaboration however with 3M did not prevent them from working with Sperry Rand or others and supplying them with tape. IBM had a degree of proprietariness in the type of tape they marketed for the 701 and 702 and other 704 and 705, and other computers, in that IBM developed a proprietary finishing process which eliminated all surface imperfections in the tape supplied to IBM by the 3M company and enabled IBM to guarantee a very, very high degree of accuracy. IBM actually built in the Minneapolis area a tape-finishing plant only a few miles away from St. Paul, to enable IBM to finish the product that they received from 3M, package it and ship it directly to IBM customers.

As time went on, the manufacturing processes improved so dramatically in the manufacture of 3M of magnetic tape that the value of the finishing process diminished because there were not as many imperfections in the tape--raw tape that was supplied by 3M to the IBM Company.

In the mid 60's--I can't pinpoint it exactly when it was--3M decided that it was in their enlightened best interest to be more than just a supplier of tape to the main frame manufacturers. They elected to go retail as a supplier, as well as wholesale--or to go retail as well as OEM. And at that juncture, IBM decided that it could not rely totally on a sole supplier of tape who would also be selling a competing product in the field identical to the IBM product, that no

matter how well-intended the 3M management might be in its marketing program, that it was almost impossible for them to restrain their sales force from capitalizing on the fact that they were the supplier of the tape to the IBM Company that was repackaged and brand-labeled "IBM".

So this caused the relationship between IBM and 3M to part. About that time, 3M's patent position was held to be invalid. They had been successful in acquiring monopoly control over--I think it was an Institute of Illinois Technology invention by Dr. Camras, that early on gave them a dominant patent position in the field of magnetic tape. The courts because of litigation introduced by others against the 3M Company, held that there was a misuse of the Camras patent and 3M Company was forced to open up its patent licensing on all 3M magnetic tape patents to all applicants. This transpired about the time that 3M decided to go retail. Also, about that time, the Memorex Company--people had spun off from Ampex and established the Memorex Company--and its success in the magnetic tape field, to some degree, and its boldness in being willing to operate without a patent license in the field of magnetic tape, I think were factors that caused 3M to go retail as well as try and retain a wholesale posture in the magnetic tape field. IBM decided at this juncture to seek a license from 3M under its magnetic tape patents and produce tape in house. IBM had embarked a number of years earlier on a research and development program for magnetic tape and had successfully produced a magnetic tape in the lab. But IBM had difficulty producing the tape in large quantities and was struggling in this respect in the period of about 1965, and I recollect. It was at this time the Sony Company in Japan came to us with their version of a very sophisticated audio tape that they felt had computer capability. We tested this tape, concurred with the Sony Company that it had the potential, and were convinced--because they were mass-producing this tape--that they knew how to produce it in volume. We began a program about mid '65 of collaboration with the Sony Company who had opted not to go into the magnetic tape business for computers as a supplier, either wholesale or retail, and we contracted with them to set up a magnetic tape plant for us in our Boulder facility in Boulder, Colorado. They did a phenomenal job. Absolutely phenomenal. I remember very well that we finalized the specifications to which the plant would build the tape on December 7, Pearl Harbor Day, 1965. They proceeded to manufacture the plant--I'm talking about the machinery for the plant, not the brick and mortar--during the period following, subsequent to December 7, '65 and I saw tape in August of '66 coming

off of the machinery that they installed in the Boulder plant. Now, this wasn't saleable tape. The tape still had to be debugged and that maybe took another six months. But it was, I think, a fantastic achievement to build and install, after transporting from Japan--together with technicians--a tape manufacturing facility in such a short time frame.

TOMASH: Now, there's an example of reverse technology flow. It's one of the few that I've heard. I've never heard this story before. We were talking about this at breakfast this morning--reverse--where we did get back something from them.

BIRKENSTOCK: We certainly did, and IBM became free of its dependence on 3M Company for its magnetic tape, and had a fully proprietary tape item that it produced for use with IBM machines and for sale to its own customer market. Of course, in the meantime, other tape production facilities were emerging, as I referred to earlier: there was the Memorex Company already producing a tape of a specification capable of use with the IBM and other computer equipment, and so forth.

TOMASH: That's an interesting story.

BIRKENSTOCK: Now, where would you like to have me go from here? I've sort of gotten off on a tangent explaining IBM's relationship with several suppliers of media fundamental to the development of a successful entry into the electronic data processing industry.

TOMASH: The period from '56, when the decentralization of IBM took place, forward is where you were, I think, when we got off into these examples.

STUEWER: I don't know if we want to pursue that, but another possibility would be to discuss your connections and your negotiations with the Japanese government and some of the topics that we were talking briefly about this morning at breakfast. That would be another possible area.

BIRKENSTOCK: Well, going back to the reorganization of IBM in '56 and my responsibilities being now shaped to form an organization called "Commercial Development," that was under the Booz Allen & Hamilton plan and the IBM organizational structure given powers reserved to the corporation dealing on patent licensing matters, patent operations, technology transfer, standards and so forth, across the board of all IBM divisions and subsidiaries. It fell within my orbit of responsibility to deal with competitors worldwide and foreign governments. In 1954, the Japanese government passed the Foreign Investment and Foreign Exchange Laws of Japan, which required Foreign Resident Companies to become validated under the Foreign Investment Law and Foreign Exchange Law of Japan.

It took us several years to really understand the Foreign Investment and Exchange Laws of Japan. IBM was operating at that time a branch of World Trade Corporation in Japan, called IBM-Japan. It was basically a tabulating machine marketing organization, with a small plant producing tabulating cards and a few models of tabulating machines, keypunches and sorters. When it was decided that we would seek validation in about 1957 under the Foreign Investment and Foreign Exchange Laws of Japan, it fell into my area of responsibility to accomplish this mission. And I set about to negotiate with the Japanese government.

TAPE 2/SIDE 1

BIRKENSTOCK: We needed negotiating leverage so we postponed negotiations during the 1954,'55,'56, time frame, our negotiation strategy started with the development of a stronger patent position than we enjoyed. We began to file extensively in Japan patent applications on our developments in the tabulating machine filed as well as in the newly emerging electronic computer technology. Both of them we recognized as being important to our negotiating strength in Japan because of the relationship of tabulating machine technology as peripheral support to electronic computers. We filed of course patent applications on IBM inventions arising out of the SSEC and the 701 and the 702 and other developments.

In about 1957 we considered that our patent strength was sufficient at least to begin a program of discussion and negotiation with the Japanese government. Our timing was also responsive to an approach that Mr. Komai of the Hitachi Company made to us, indicating a desire on the part of his company with approval of the Japanese government to seek a partnership with IBM in Japan. He called on Mr. Arthur Watson of our World Trade Corporation, to explore this possibility, and also to indicate his company's interest in purchasing or renting an IBM 700-series computer for application to certain of the Hitachi Company's scientific computing or accounting requirements--I don't remember exactly which; I think it was their embryonic atomic power station program.

I was invited to attend the conference between Mr. Arthur K. Watson and Mr. Komai and it was decided that now would be the appropriate time for us to make a move along negotiating lines in connection with our validation in Japan. Several weeks later I made my first visit to Japan as a follow up to the discussions initiated by Hitachi. Following this and in the same year I began what was to be a series of discussions with the MITI (Ministry of International Trade and Industry) relating to a validation of IBM Japan. MITI's demands on IBM at that time were quite severe. They wanted IBM to be validated only as a joint venture with another Japanese company. They suggested five candidates. The prime candidate was the Hitachi Company. They also proposed Oki Denki, Nippon Electric, Fujitsu and Matsushita among the candidate companies that IBM could choose for the proposed joint venture. One of their conditions was that IBM would open up all its patents and future developments to that company. Another condition was that IBM would disclose all its know-how to that company. From the beginning we stood firm against MITI's joint venture and know-how disclosure demands. We stressed that it was against our policy to enter into joint ventures anywhere in the world, and that our policy was one of 100% ownership. We also pointed out that it was not our policy to transfer know-how to any of our competitors anywhere in the world except in certain well defined technologies and only on a quid pro quo basis where, as for example, in magnetic core technology, we entered into a transfer of magnetic core testing know-how in exchange for magnetic core composition know-how. Against great pressure from the Japanese side we rejected joint venture as a possible business relationship.

Our practice in Japan was as it was elsewhere in the world to collect a 10% royalty from our subsidiary for the right to use our patents. The Japanese government objected strenuously to this outflow of foreign exchange--due in payment of patent royalty by our Japanese subsidiary and they had embargoed the fund transfer.

Another bone of contention was production. All forms of production needed Government approval. They objected to our request that the IBM facility, our Japanese plant, begin producing electronic computers. We were at that time moving into the early stages of the 7000 series--electronic computers, the first fully transistorized computers. What MITI wanted us to do was to hold back on electronic computer production in Japan until designated Japanese computer makers such as Hitachi, Fujitsu, etc., caught up with the technology. We said that we wouldn't do this. They offered us a side agreement whereunder IBM Japan would proceed in secret to tool for production. This we of course could not do because it would give man unfair competitive advantage over Sperry Rand and other competitors who were desirous of entering the Japanese computer field. Resisting all such proposed terms we stuck to our position and said that the only thing acceptable was a royalty bearing cross license, coupled with IBM Japan's right to produce electronic computers and remit a 10% royalty on sales. A true quid pro quo. We offered to pay for Japanese patents when used on IBM products, in exchange for a cross license under the IBM patents to those Japanese computer makers designated by MITI. This would be in exchange for a validation by MITI of IBM Japan under Japan's Foreign Investment and Foreign Exchange Act with guarantee of full royalty remittance on a 10% royalty basis. Also the right to produce state of the art technology for IBM Japan's marketing needs with full MITI approval and concurrence. This to be in exchange for IBM's opening up its patents in Japan. Another demand that MITI made was that IBM Japan's products have a 100% domestic content. We rejected this demand as impractical and showed MITI why it could not be achieved.

They, at one point in time, insisted that not only it be 100% Japanese parts content in the machines per se, but also that the line of products that IBM marketed in Japan be 100% made in Japan. This was impractical because IBM's foreign production strategy was not building the entire line in any country outside the U.S.A. For example certain machines were built in France for export to other subsidiaries of the World Trade Corporation, certain machines in

Germany, etc., thus producing economy of scale on the various computer system products that comprised IBM's broad line of products. We established and sustained our position with MITI in this regard. We insisted on the right of importation into Japan of products to round out an IBM system, as well as the right of importation of components into Japan to enable the production of a particular model or product within the IBM line.

The battle of negotiation and words spanned about a three-year period with the Japanese government. We concluded early in this challenging negotiation that we had chosen wisely in relying on our patent strength and we concluded early in the game that it was of little use for us to negotiate separately with prospective licensees in Japan or the designated computer industry of Japan--the Hitachi's, the Fujitsu's, the Oki's, the NEC's, for example. We recognized early that we must negotiate directly with MITI, and we embarked on this course of action. Finally at the end of a three-year-plus period and a great deal of brinkmanship, we succeeded in getting MITI's agreement to validate IBM Japan as 100% owned IBM subsidiary. We saved their face on the 100% issue by agreeing to grant 1% of the stock in IBM Japan to our board of directors on a nominee stock ownership basis without voting rights. This stock reverted to IBM Japan in the event of the nominee owner ceasing to be a member of the IBM Japan Company, or for reasons of death, resignation, or discharge of employment, which very rarely happens in Japan of course. IBM Japan thus became a validated, 100% owned company with the right to produce whatever equipment it elected to produce within reason. We showed MITI the--agreed upon the--courtesy of reviewing our production into Japan. We gave in exchange for this validation a royalty bearing patent cross license to each company nominated by MITI as a licensee. The term of this cross license was for a term equal to but not exceeding the term of validation of IBM Japan, namely five years. It is MITI's practice not to validate foreign owned subsidiaries for a period beyond five years, and therefore it became our policy not to license any Japanese company under our patents for a term beyond the five year term of the validation. So this meant that every five years we had a new round of negotiations with MITI. They'd place each time new, and somewhat different demands on us. We countered those demands with growing strength of our patent portfolio, and the implied threat of a cut-off of a patent license to the emerging computer industry of Japan if MITI wasn't reasonable with us in permitting IBM Japan to operate as a validated company.

For the benefit of all concerned it has worked out. Japan has lived up to its commitments in all instances and so has IBM. The cyclical negotiations weren't easy however with our first agreement entered into in 1960, due to expire in '65. We started in '63 to begin our negotiation for our renewal. Both sides had reasons to revise the initial license agreement and we made some downward adjustments in royalty rates that we thought were logical and prudent. We also made some adjustments under the agreement on license administration because the integrated circuit technology was beginning to emerge. From a patent administration point of view, the assertion of patents in an era of integrated circuits took on a new and different order of complexity than during the period when transistors or semi-conductor components were discrete devices and more easily analyzed from a refinement and adjustment. During this period we discerned the threat of government control and ownership of certain patents and inventions made within the Japanese computer industry and we began to shape our freedom of action under our patent licensing arrangements so that IBM stood in reasonably good position when later on, in the '70s, MITI decided to embark upon the VLSI development program. This program was heavily funded by government money. Under its concept it set the goals, technologically speaking, for a consortium of Japanese companies to achieve. In meeting these scientific or engineering goals, the inventing company assigned the patent rights to the government. IBM's earlier anticipation of the likelihood that this could happen, caused us to insist on protective terms in our cross licensing agreements with the Japanese thus enabled IBM to sustain freedom of action under thrust of the Japanese government VLSI program. IBM's position at the end of the program forced the Japanese government to open up its VLSI and semi-conductor patents and other patents that related to the computer industry under an open licensing program available not only to IBM but to all other semi-conductor and computer companies who required a license.

TOMASH: Very good. I have a new direction if you want to pursue this one.

STUEWER: I guess I'd like to ask maybe a couple of very naive general questions on this interchange.

BIRKENSTOCK: Before you do, and while you're thinking--make a whole list of them. I'd appreciate it because I don't want this to be a monologue. Well now, gentlemen, where are we? And what would you like to ask?

STUEWER: Yeah--it's a very general, naive question, but--when one thinks of going to a foreign country, one thinks of going into an entirely different cultural environment, and especially different linguistic--different language, and you hear today that one of the reasons that Japan is successful in the United States is because every Japanese speaks English while the opposite isn't true. I remember when Irv and I had lunch with Bob McDonald, he was describing some of the difficulties of, I guess it was Univac in Germany, I think at that point, simply because of different cultural perceptions, different modes of operation as it were, and I'm just wondering if these played any kind of a role, presented difficulties to you in your negotiating modes? Did they have any force at all?

BIRKENSTOCK: They had great force. They presented great difficulty. The culture is entirely different. One had to become a student of the culture. I felt that I had done so. I could talk really all morning on this. It's very interesting. I spoke about the Sony Company. We achieved great credibility with the Sony Company that really led them, in part, to come to us and to make a very fine and productive agreement with us on the production of magnetic tape. This emanated from really our understanding something of the culture of Japan. Dr. Leo Esaki, a Sony scientist, had decided that he was going to want to come to the United States and pursue his career as a scientist in the United States. He thought it opened up doors and opportunities for him personally that he couldn't enjoy in Japan. So on a trip to the U.S. he visited TI, RCA, and IBM. Esaki made known to these companies and perhaps others, his interests in leaving Japan and affiliating with an American company.

Because he was a foreign national and a member of a prominent company in Japan, and it would have been improper under Japan's culture for us to deal directly with him, the matter was referred by IBM Research to me for guidance. I said, "Make no offer to Dr. Esaki until it's cleared with the Sony Company," because this is the way they do it in Japan. They don't hire people directly from one another. They ask permission, if there is any employee transfer between two organizations. Accordingly I contacted Mr. Ibuka who, at that time, was the Chairman of the Board of

the Sony Company and I told him the circumstances under which we became acquainted with Leo Esaki's interest in becoming a part of a U.S. company, and that we would be very much interested in interviewing Dr. Esaki and if appropriate, make him an offer, provided it did not do irreparable harm to the Sony Company. We asked if we could proceed with their permission and blessing.

The other companies didn't do this --to my knowledge. This was very well received by the Sony Company. They in fact were impressed by our conforming to the Japanese way. We had adjusted to the Japanese culture in this regard. They came back after due deliberation with a letter. "Yes, losing Leo Esaki will be hardship on the Sony Company," Mr. Ibuka wrote, "but we are reconciled to it. We feel that this is an important part of the future development of Dr. Esaki. We hope someday that Dr. Esaki will return to the Sony Company and play an important role in Sony's future. We ask that should IBM acquire the services of Dr. Esaki that IBM understand our views in this regard and not impose an impediment to his return. We are," he stated, "suggesting to Dr. Esaki that because of the way in which the IBM Company has proceeded on this matter with us, that he focus his interest on the IBM Company. We have recommended that if he does leave us and pursue a career in the United States that it be with the IBM Company."

Initially Dr. Esaki was granted a leave of absence by the Sony Corporation to join IBM. He has never returned to the Sony Company although he's free to do so if he should elect to. He has even become a member of the board of IBM Japan. He is a co-Nobel Prize winner. The Sony Company received great credit for producing a Nobel Prize winner. The invention on which he was awarded the Nobel Prize was the tunnel diode, made in Japan when Esaki was a member of the Sony Company Research. Even today our relationship with Sony persists as a highly respected relationship. Even though to a minor extent we compete in the dictating machine field.

TOMASH: Very nice-?-

STUEWER: A marvelous example!

BIRKENSTOCK: Now we were talking about company collaboration and I'd like to make two points. I'd like to make the point of another important collaboration that IBM had in the emerging computer electronic computer era; I'd like to make the point of how important entrepreneurship is and was to the emergence of the IBM company in this era. I refer to a relationship that evolved from 1957 on with the Texas Instrument Company, and it gives me an opportunity at the same time to illustrate the importance of entrepreneurship, and the entrepreneurship credit that is due Tom Watson, Jr., then President and C.E.O. of IBM.

Tom Watson, Jr. made a number of key decisions in the emergence of electronic computing in IBM. One I touched on--the decision to abandon electrostatic (Williams Tube) storage and switch to magnetic core storage. At the time that he made that decision, magnetic core storage was not economically feasible. Cores were costing us about 35 to 45 cents per core. He foresaw the economy of scale resulting from a 100% switch to magnetic core storage would enable IBM to produce a memory system that was economically feasible. It was a bold decision. We didn't know that much about the core. We certainly didn't know that much about fabricating cores at that stage. We knew that architecturally in a computer they were viable and valuable. He took a crash production program. A decision was implemented both by IBM engineering and commercial development in a way that I described in my earlier discussion pertaining to our relationship with the General Ceramics Corporation and ultimately with Philips and Eindhoven.

Another key entrepreneurial decision concerned the vacuum tube computers; the 700 series (the 701, 702, and 704). I think vacuum tubes were pretty much employed on all the 700 series computers, and Watson recognized even ahead of the IBM engineering people that we had reached the point where IBM should go 100% solid state. IBM engineering management at this point in time could not convince themselves as to the economic feasibility of transistors which were running around \$1.25 a device. At that point, it is my recollection that the financial planning department projected costs would have to drop to the 40, 50, 60 cents per device in order to achieve an economically feasible solid state computer.

I remember Tom, Jr. calling a meeting of his key staff people, and saying, "You doubting Thomases say that transistor electronics isn't here." And with that he placed a stack of radios on the table named IDEA. It was the first transistorized radio produced in the United States. The radio used TI transistors, and was produced by this company IDEA. He said referring to the transistor, "They're here for them and they're here for us in computers." From this day on he stated there shall be no more planned production of an IBM vacuum tube computer. He ordered they all be transistorized. He repeated "this is an order and that's what we're going to do." "But we don't have any transistor capability," said the engineer at the meeting. "We have experimented with transistors; we know what transistors are capable of. But we have no production facilities for transistors or experience in manufacturing them."

At Tom Jr.'s order I was assigned to work with the engineering and manufacturing side of the house to find on the outside a transistor manufacturing capability to meet IBM requirements. Together we assessed the production capabilities outside of IBM, the outcome of which was to approach TI and negotiate a comprehensive contractual relationship with TI whereunder in the early stages of our 7000 series machine production IBM was 100% reliant on TI for the transistors which we assembled into the IBM electronic computers of that era.

It was a fine relationship. TI performed well. They understood from the very outset that IBM was going to vertically integrate semi-conductor production in the IBM company. Nevertheless, they cooperated beautifully. TI became a powerful supply arm to the IBM company and still are today in the semi-conductor field. There had to be under that program a close working relationship with an exchange of technical competence, confidentiality. It worked out fine. I think it also worked beautifully for TI because it gave them a base requirement sufficient to generate an economy of scale in the production of transistors that gave them a leadership position in the field. It gave IBM what it was seeking which was an ever-declining price as TI came down the learning curve. It also brought about an infusion of TI technology into IBM in reciprocation for IBM procurement requirements based on IBM computer architecture. This enabled TI to become a supplier not only to IBM but to the rest of the computer industry.

All of this resulted from a bold entrepreneurial decision by Tom Watson, Jr. It simply would not have happened if the entrepreneur had not been involved in the engineering cycle. The engineers would have waited and waited and perfected and perfected until they thought the normal events of technological development had produced a transistor that was economically feasible, or a magnetic core that was economically practical.

TOMASH: Jim, as I was saying out in the hallway, to those of us who are with smaller companies, you were "Mr. IBM". We're interested in how we looked to you. Any recollections you have of this as to how the small companies--how that program operated in IBM--looked to you and your associates?

BIRKENSTOCK: My reputation in the industry evolved, Erwin, because of the responsibilities that I as Director of Commercial Development had along with Commercial Development's contacts within the industry. We had excellent liaison and credibility with the rest of the industry due to our patent licensing programs. We had responsibility in IBM to develop a patent licensing program of high credibility and in conformance with STET IBM STET. We evolved also into the IBM arm for standards administration. IBM's participation in industry standards--this was another command decision of the entrepreneur Watson who said, "Yes, we're going to take a leadership role in standards for the industry. We think standards are right for the industry and what is right for the industry is right for IBM. It opens up the industry," he reasoned, "but the industry should be opened up and standards would play a key role in an open computer industry." There was a side of the IBM house that resisted this, but his command decision swept away the opposition in IBM. The assignment of getting IBM involved in the standards program fell within the sphere of Commercial Development. This activity put me and others in Commercial Development in frequent contact with other companies in the industry as did the open patent licensing program that IBM pursued. Throughout we had to maintain a posture of high credibility and absolute integrity.

On the other side, looking at IBM from outside in, IBM was always somewhat, due to its now highly divisionalized organization structure, a mystery to the other companies in the computer industry. We recognized that it was not healthy for IBM to be misunderstood as to be uncooperative and unresponsive to competitive queries or their

complaints; hence we promoted Commercial Development as the "open door" through which the other manufacturers could enter to be heard, to have their requirements discussed. We didn't have all the answers in Commercial Development but we knew where to go to obtain answers in the IBM company. We were, in effect, the broker through which a Control Data, A Sperry Rand, a GE or an RCA, or peripheral equipment suppliers like your company and others could enter to seek information from IBM, or to register a complaint with IBM. And that's how we or I if you will, became known as "Mr. IBM". At this point I want to de-emphasize the "I" because it was a very large and loyal and capable staff of people who created this Mr. IBM image. This was not a one-man effort by any means.

As years rolled on, and a couple of years before I stepped down and retired from my position in IBM, Commercial Development was more appropriately re-named to be the Commercial and Industry Relations arm of IBM, thus to give more recognition to the fact that it had a responsibility for industry relations broadly speaking including the now-emerging leasing companies who always had a lot of problems --also Service Bureau companies and the like (Tom Spain was the man in Commercial and Industry Relations responsible for keeping a finger on the pulse), the companies of the industry outside IBM and taking an advocate's position on their behalf as IBM developed policies and practices that might rub off on or relate to the companies that were emerging in the industry, such as the PCM's, and the leasing companies. This was IBM's point of not only trying to be fair but it also served as a means to guard against aggressive and thoughtless policies that might create negative anti-trust posture that we could not defend.

TOMASH: Jim, you've talked a little bit about the open door policy; from the point of view of IBM looking outward, you also had...

TAPE 2/SIDE 2

BIRKENSTOCK: Tom Spain and his staff did not just sit in Armonk and receive the complaints or the requests of the outside competitive world, but they actually went out among them. They called on these people and they tested the

water, so to speak: "What's your attitude on IBM in this area? What's your opinion of IBM in that area?" They asked them to be critical. They exposed themselves to this type of thing at industry meetings, in standard forums, and by direct one-on-one calls and interviews with the hardware competitors and the leasing companies as well. They, in some cases, before a practice or a policy was cast in concrete in IBM, went out and tried to ascertain from the competitors how well the policy or practice would be regarded by the competitor--I shouldn't say acceptable to them, but whether it would be tolerable. IBM went through an era of unbundling its software. That was a rather traumatic period within the industry, and the Commercial and Industry Relations group played a key role in trying to adjust the IBM practices and policies to every reasonable extent so that it would reduce the trauma of a major policy change within the computing industry initiated by IBM so that it would be the least degree possible.

TOMASH: I had in mind a little bit more of the aspect of the impact of these people on IBM, rather than the impact of IBM on them--a little earlier. For instance, the activities of RCA or GE or Control Data--how they were viewed within IBM as competitive threats to IBM's business. Was that also channeled through your area?

BIRKENSTOCK: Well, yes and no. Of course, one branch of IBM--the marketing branch--generally speaking, by the very nature of its operation, looks upon the activities of another organization in the field as a competitive threat. That's understandable. On the other hand, some of the other branches of IBM--most notably of course the Commercial and Industry Relations branch, or Commercial Development as it was named earlier--recognized that there had to be competition and that competition was healthy for IBM, and that we should do everything to assure that competition got a fair deal. We had to conduct ourselves in IBM in a mode, in aiding the development of competition, if you will, and did so in a manner that was non-discriminatory. For example, what we did for Sperry Rand we had to be ready to do for Control Data, or Burroughs, etc.

So the Intelligence we brought to other IBM areas from the outer world--the other companies in the industry--played a significant role in our being able to shape a program within IBM that would allow recognized the right of IBM

competitors, but not to the point that the competitor would be given an unrealistic advantage over the marketing side of the IBM house as they competed fairly and freely in the field for sales. Does that answer your question, Irv?

TOMASH: Well, in the early days, when the companies were just emerging--in the 50's period--those of us in that fringe area had a feeling that IBM was doing some monitoring; the more paranoid thought you were doing some spying. I certainly never felt that. IBM had a deliberate policy of tracking everybody and indeed I've picked up--some of these rumored kind of things that IBM some- times sponsored a little work at different companies just to keep a screen on things. This is all the negative view of the same actions. Would you comment on that kind of...

BIRKENSTOCK: Yeah. I don't think IBM did this in an unethical way. We had for example as a prudent business practice-a patent watch. A patent watch enabled us to keep in constant touch with patent application filings in Belgium and France and other early publication countries to ascertain what technology was being filed on what might be a threat of the future. This was "public domain tracking."

Yes, we kept track of the competition and we monitored it. What company doesn't? As far as on a Machiavellian approach to let contracts with a competitor to just pick his brains: no, we never did that. It might have seemed like we did it, because it's very difficult to get a development contracted for on the outside to surmount and survive over the NIH factors from within. And as I said, when we went out to TI, we did it openly, saying to them that "We're going to build transistors eventually and you've got to understand this." We said this to 3M in the magnetic tape era of development. And they understood it. We said it to Philips in our relationship with them, and they in turn, were very fair with us. We had people in their lab, and they had people in our lab, and I remember Philips saying, "Hey, we just want to tell you that now Dr. Casimir and his people feel we must go into computers and that our relationship is such that it could lead to conflicts of interest and misunderstanding if we didn't adjust our relationship to accommodate for this." We said we understood and there was a pulling back on both sides of resident personnel in each other's research laboratory.

But this was all open and above-board. We entered into a development program in good faith in the magnetic drum area with ERA, with John Parker. We contemplated having ERA produce for us a magnetic drum computer, but in the meantime, as programs we contracted for lasted a year or 18 months or something like that, come up with a design, IBM people in-house were sufficiently motivated by the existence of that outside contract so they started performing engineering miracles that maybe they wouldn't have performed if we didn't have that outside agreement with ERA. That made it look like we were using ERA in the end, I suppose. But we didn't intend it that way. Mr. Hamilton in charge of IBM magnetic drum computer design came forth with a fine development which IBM as it turned out, elected to put into production. And beyond receiving and paying for the ERA design, we did nothing with it. I believe ERA benefitted from IBM funding the project. It so happened that we had told John Parker, "Look, if we do produce this ERA design, that we never want to put ourselves in a captive position to any company, particularly a small company, and therefore we're going to insist as a part of our arrangement, that we have an option to a nonexclusive license under your patents, so that at some time in the future, should we elect to want to produce the machine in-house, we will have the right to do so." And that was the basis of our understanding, and it was understood from the very beginning and was acceptable.

We probably would not have exercised our option as promptly as we did, to take a license under ERA patents relating to the ERA drum computer except for the fact that ERA was acquired by the Sperry Rand Company, and when that event occurred we elected to exercise our option to a paid-up non exclusive license so that we wouldn't have any undue difficulties with the Sperry Rand Company. We didn't plan to use the ERA company in any other way than the way I've described. And the ERA was perfectly free to license other companies, and I suppose did, as a division of the Sperry Rand Company. But, yes, you could look back and construe, and I think unfairly and erroneously, that there was an organized attempt by IBM just to let contracts to find out or to penetrate and discover what other companies were doing, but I assure you that, while it might seem to be that, it wasn't because, in truth, it wasn't necessary on the part of IBM. There wasn't any group that was more prone to brag and publicize their technical efforts than the emerging scientists of the emerging electronic computer era. They all were vying with one another to deliver papers at symposiums, and IBM had no problem in tracking what was going on from the published

information; this we did. As I said, the patent watch was watching the published, laid open patent applications. We watched the technical journals; we attended all the symposiums. We presented our papers and we listened to the papers of others. Our engineers had a discussion with other engineers but legitimately. That was the name of the game. We worked hard at it, and we reported hard. And as far as I know, IBM still reports hard today on its intelligence that it picks up from published information.

TOMASH: That certainly answers that aspect of it. Did any of these companies that you had contact with, particularly in those early days, look to you like winners? Did any of them cause you concern?

BIRKENSTOCK: Well, I think--yes, many of them looked like winners. One of my responsibilities was to expand the freedom of action of IBM so that there would not be patents outstanding that would inhibit IBM's going in any direction that engineering might elect to go in pursuing the opportunities available to it in the data processing field. There was a high degree of credibility emerging on the part of many of the companies. We foresaw the emergence of a many-faceted industry that IBM couldn't possibly serve entirely unto itself. We foresaw the PCM's coming along; we foresaw the peripherals coming along and emerging, because it was obvious to us way, way back that the ratio of mainframe hardware rental-wise and so forth to peripheral hardware was going to diminish and that there would be a time come when--the relationship would be 70% peripherals to 30% mainframe. In the early days it was just the reverse, you know. We foresaw many companies playing a role as peripheral manufacturers. You know, IBM wasn't strong in everything. IBM wasn't strong in cash registers, for example. We knew cash registers would be integrated into a data processing system; that various types of memories and memory hierarchies were going to be integrated. IBM didn't underestimate these emerging companies. Some of them had strong managements and some of them had weak management. Some of them had the ability to combine marketing with engineering, and those were the ones that basically succeeded; those that combined good marketing and engineering and good management. The ones that primarily failed were the ones that had the brains and smarts in engineering, but lacked the smarts in marketing. Sperry Rand was out ahead of IBM in pure technology at one point. But IBM accelerated rapidly from a marketing

point of view, and that was very much a command decision again of Tom, Jr. To this action a great deal of IBM's early emergence and market strength can be attributed.

RCA, I think history will show, had good technology, but they lacked management understanding of the computing industry, and marketing strength. And it was primarily that--the lack of marketing strength, not the technology--that did them in.

The same thing happened basically to GE. GE thought that they could run computers like they ran every other division of their company. GE had the muscle, the financial muscle, and certainly the technical muscle. They just didn't understand the computer industry well enough and wasn't committed enough to put marketing resources behind their computer business, and didn't have the management viewpoint of staying with it long enough to be successful in it.

We took them all seriously. GE surprised me. I thought that GE would emerge to be one of the dominant companies in the industry. We took GE very, very seriously and as far as I remember, my associates in IBM were highly surprised at GE's failure.

TOMASH: It seems to me that one of the stories here is very important. I've spoken to Al Chandler who is a professor at Harvard in the Business School. He's an historian--Pulitzer Prize winner--and so he's probably the premier business historian in the country. This story would be a great Ph.D. thesis --which is the transformation that IBM did to itself successfully from being the premier electro-mechanical tabulating company to becoming the premier electronic computer company. It had to transform all of its organs to make that change, and that was a triumph of management, not an easy thing to do. IBM has never really been given credit for having done that kind of a job. Most companies have failed--they've gone out of business when the product leads them. First, I'd like you to comment on that, and second, if we can record a few names, a couple of names you've mentioned so far of that period; one was Learson who was kind of the "czar" of that program.

BIRKENSTOCK: That's right.

TOMASH: Another was Wally McDowell. Was he the one who presided over the transformation of the engineering department?

BIRKENSTOCK: Yes. Inspired to do so by Tom Watson, Jr. I don't think that this transformation would have happened if Mr. Watson, Sr. didn't have a son named Tom who was destined to be the heir apparent in the IBM Company. I don't think it would have happened except for Tom, Jr. I don't want to be unfair to Mr. Watson, Sr., but I don't think it would have happened. It happened only because Tom Watson, Jr. was of the conviction that there was an emergence here of technology that was important to the IBM Company. Tom, Jr. had the strength to confront his father on this and survive. I couldn't have confronted his father and survived. I was once, for a short period, General Sales Manager of IBM, and I didn't survive in this post. I was General Sales Manager under Mr. Watson, Sr. who was perhaps one of the premier sales managers or sales executives of the country, maybe of the world.

TOMASH: Maybe in history.

BIRKENSTOCK: Yes. He was good. He was fine. But he couldn't tolerate different points of view. My differing point of view from his was one of the reasons that I was replaced in the short period of time. Another reason was, I was only 33 years of age. Not quite dry behind the ears as a seasoned executive, to be quite candid about it. But neither I nor anyone else would have been able to persevere in the role that Tom, Jr. played in this emergence of electronics in IBM.

For example, when Mr. Watson, Sr. assigned me the job of getting IBM reactivated along the Military Products line, as a service to our country at the beginning of the Korean War if I were to have said, "Mr. Watson, this is our opportunity to get into large-scale electronic machines," he would have thrown me out of his office. To produce a

computer later called the 701 in this time frame evolved between Tom Watson, Doc Hurd, and myself. It was Tom, Jr. who went to his father and said, "Dad, this is our future," and he sold his father. He was able to reason with his father. I probably would have gotten fired, or Wally McDowell would have gotten fired; and when, politically the door was opened by Tom, Jr. for IBM to hire all of these engineers to become an emerging force in the electronic computer industry, Wally McDowell was one of the people that implemented it from an engineering view point.

TOMASH: Couple of questions: in the marketing area, is there an individual equivalent to McDowell that we should be focusing on who implemented the transformation? This was to retrain a sales force in a new technology, to take a new approach. This is very seldom done. This was a home-run into the bleachers--a tremendous achievement.

BIRKENSTOCK: Vin Learson was a key man in that area. He became the czar, both from the standpoint of seeing that we had the resources from a manufacturing as well as an engineering point of view to implement this program, but also the resources in the field--the marketing strength. And Tom, Jr. himself played a very, very key role. He held staff meetings every Monday morning to assess our problems in connection with the 701 and 702--and our problems primarily were problems of a marketing nature. There were of course some research and development and technical problems. Vin and his staff were key performers of the period. I'd have to do a little research as to who were the several key individuals that were the support arm in marketing to Vin Learson.

TOMASH: ...he, of course, later on, Roger for your information, Vin Learson was the Chairman of the Board of IBM for a period. But in the very formative period when Univac was selling machines and IBM was still entering the commercial period, Learson took hold of that whole program and literally turned it around--that's the impression we got from the outside.

BIRKENSTOCK: That's right. He played a very, very key role and his strength and his background was marketing. I don't know how available Learson would be to an oral history. I hope he would be. I think he might. He's a busy guy. He's heading a reinsurance exchange in New York right now, getting that started. He's still a member of the IBM

Board. I would be glad to sit down with Learson and have him at least recollect some of the key lieutenants that were on his staff from a marketing point of view in that era and who might be candidates for oral interviews if you pursue the marketing aspect.

TOMASH: Right. Best would be of course, to talk to him. What do you think about the possibility--of course Mr. Watson, Jr. is in Moscow--personality-wise and attitude-wise, towards an interview in which we addressed some of these things. You know, from a positive point of view, the tremendous transformation of the IBM Company has got to be a managerial landmark.

BIRKENSTOCK: Well, I can't speak for Mr. Watson, Jr. I would think if his time and schedule permitted, that he would be pretty cooperative to you.

TOMASH: Those are two...

BIRKENSTOCK: Many, many people have played a role. Frank Cary has; John Opel has; and there are many people of the sales managerial-type in the background.

TOMASH: Let me ask one more question on this aspect. One of the things that all of this takes to do this kind of thing that we've been talking about is money, to decide to hire a lot of engineers, to pull your sales force out of the field and train it, to set up these other things. Would you comment a little bit about the financial side? There must have been people within IBM saying "We can't afford all this. We ought not to be risking all this money to develop all these resources. _____ Company has those."

BIRKENSTOCK: Well, the financial side in that era was headed up by Al Williams and he, as most of our executives of that era and almost up to today, came up through marketing. And once they saw the marketing opportunities, they were enthusiastic about finding and marshalling the financial resources to do so. IBM in that era was able to borrow

money at very attractive rates. I remember--I don't remember how many hundreds of millions of dollars IBM borrowed--IBM borrowed somewhere between 2% and 3% interest from Prudential. Remington Rand has a management that was looking at other fields. IBM had a management that was looking really only at the data processing field. IBM wasn't really diversified. And that lack of diversification ensured to enhance IBM's thrust into data processing--the electronic data processing field.

TOMASH: One of the things that always impressed me, and perhaps here again a little guidance as to where we might find some answers: IBM has always been characterized by some very admirable qualities. For what it's worth, I'd like you to know that in my own career as a businessman I've always used IBM and held them up as an example--"Why can't we do things like that?" I've also used them as a role model, not "Why can't we?" but we've tried to do things like you do. Things that enable you to do such a transformation that we've just talked about, for instance, are internal cooperation, people working together, teamwork, discipline, people doing things that they rally have disagreed with in the meeting but then, having the decision once made, acting as members of the team and not slowing down and fighting it behind the scenes. The quality of people-- an organization that lets the smarter, better people rise to the top and so on. Could you comment on some of those things? Those are the qualities I always admired.

BIRKENSTOCK: Well, those are all important. I think Mr. Watson, Sr. was a genius at selecting and inspiring the selection of good people. He operated under the philosophy and rule of "We'll grow IBM from within." We went outside for very, very few people. He would rather hire personnel right out of college and train them IBM's way. This practice caused a high percentage of drop-outs because he practiced what I remember him teaching me, the "third/third" policy. We'd constantly have to be analyzing the IBM work force, discerning those that are in the top third, those that are in the middle third, and those in the bottom third, and doing something about getting rid of the bottom third, intensifying our training and supervision on the middle third, and rewarding heavily the top third. This process is never ending.

And, yes, I think IBM has been successful in developing a unique breed of employee. IBM's policies and benefits have promoted and induced loyalty, certainly during my era, of its personnel. I think IBM's focus on the market, the focus on the fact that really to gain executive stature, during that era, you had to come up through marketing. You had to understand marketing. Al Williams was a financial man whom IBM employed with a CPA background. Al was put out into marketing so that he'd understand better the business and win his spurs in marketing and then on in to IBM management as Controller.

I think IBM is a skillful organization of marketeers and has a superior sales force. It had a practice that I think it relied on a specialization in the field of marketing. IBM organized itself along industry lines. It had an insurance department, a steel department, a petroleum department, and a transportation department. And on and on and on. Industry specialists called Special Representatives that marketed IBM products to these industry segments knew as much about the problems in their industry as industry leaders did. Barney Freeman, a Special Petroleum Rep, understood the petroleum industry as well as the head of Shell or Mobil. The Special Reps in the steel industry and the automotive industry knew the problems and the needs of the industry.

TOMASH: Was it a matrix, Jim? That is, there was a local salesman, a generalist, and then there was a specialist?

BIRKENSTOCK: It was a matrix--a generalist for each territory and then there was a specialist that was available and responsible on a dotted-line basis to the regional Sales Manager. I was, at one point in my career, a specialist for awhile in the transportation industry. I was responsible for railroads, trucks, and airlines in the middle west region. I had to learn what that industry required, and I knew as much about the problems and the needs of the RR industry as the Vice President, let's say, of the MoPac Railroad. When IBM began to emerge as a force in electronic data processing, the 701, 702 era for scientific computing expertise, they relied heavily on the specialists in the Applied Science Department of IBM, the Cuthbert Hurds and his staff, to guide us in the marketing of scientific computers. But when we evolved into the 702, the commercial computer, we relied heavily on the special departments and those specialists and leadership who told us what the steel industry really needs. What the aircraft industry needs. What

the insurance industry needs. Etc. It was that infra structure within marketing, I think, that guided us and helped us quickly emerge from a tabulating machine marketing organization to an electronic data processing machine marketing organization, because we were able to infuse into the special departments a realization of the opportunities and the capabilities of the electronic processor over the tabulating machine system.

And then we moved on into in-line processing, and that was another need for a new look and reformation of sales approach as we moved out of sequential processing or batch processing and into in-line processing and so forth.

And again the marketing structure within IBM was ideal to accommodate that.

TOMASH: One more thing that I remember very well admiring a great deal was the tremendous internal communication system. I was by then part of Sperry Rand and our company had been bought, and so on. Within Sperry Rand we had very difficult internal communication problems. I had trouble, as well as the customer, in keeping our various people in step. Whereas in my relationship with IBM, if I once made contact and we had a meeting or something later on, it soon developed that whatever pieces of IBM needed to be involved with this were present at the meeting or were knowledgeable about it. You had an internal network...

BIRKENSTOCK: Well, I think that is right. I think that's attributable to several things. First of all, IBM people were grown from within, and I'm not being critical of Sperry Rand. They had to do what they did. But Sperry Rand was a fusion of ERA people and Eckert and Mauchly people. And some Sperry Rand people. And these people coming in from the outside, frankly as I recollect and observed it, didn't work in total harmony. And that wasn't helpful to Sperry Rand in that era. And it probably was partially the cause for some of the ERA group spinning off and becoming Control Data.

Where at the same time there was not any disharmony in IBM. All of these people had grown up together, and in addition to that, there was a very heavy line/staff relationship with the line--with the staff concentrating on functional excellence and being responsible and being held to be supreme in their functional area, be it engineering or be it marketing or be it finance, or be it whatever it was. This heavy staff/line relationship, where they both were given

equal power and authority, from the Corporate Office, so that staff could come in and say, "Hey, we're not doing this right." Or "We think we can do this better." They played a key advisory role.

TAPE 3/SIDE 1

BIRKENSTOCK: So the role of the staff was to achieve functional superiority. This was understood and accepted by the line in IBM.

TOMASH: ...there was an engineering staff and then there was a divisional set-up...

BIRKENSTOCK: Yes, many staff groups. There was an engineering staff, a manufacturing staff, and a marketing staff. Each worked in harmony with the line operation, and were responsible for advising, critiquing, viewing with alarm, as the arm of the Corporate Office to see that IBM maintained a high degree of excellence in each one of the functional areas of the business. Our competitors didn't have this line and staff, and many of them perhaps couldn't afford it. This management concept enhanced communication because the staff could take an inquiry or a problem and carry it right on through down into the various line operating organizations, and ascertain results or carry back information to top management or to the outside as the case may be.

TOMASH: That's very, very good. I once read a very interesting little book which is a set of speeches that Mr. Watson, Jr. gave at Columbia, called "A Business and its Beliefs." It was a set of invited lectures. He was an annual lecturer at Columbia. That's very interesting. He dealt in general terms with some of these things, but not in specifics.

BIRKENSTOCK: That's very worthwhile reading. I have given you a highly disorganized and dis jointed resume of some of his principles, interspersed with some specifics.

TOMASH: Have to go in a couple of minutes--let me just ask you this then: our whole conversation this morning has dealt with--starts about with the 701. Do you have any reminiscences or remarks to make at all--you were with the IBM Company of course, several years before that period. The SSEC was going on, and Hurd and his Applied Science Group was sort of in place as you started your story this morning. But could you comment a little bit about that period? If you remember any of that--or if it impinged your consciousness at all.

BIRKENSTOCK: Well, Hurd was in Applied Science because we had a Card Programmed Calculator that Hurd and his people were very helpful in marketing. It was the mainstay in scientific computing of that era, followed by the 650 drum calculator that I alluded to. Earlier we had the SSEC that was more or less a technological curiosity, I think, I'd have to say, rather than a product that achieved something in the market. I think we've got to cut off and resume at another session if you elect to do so. But I think there are other areas of innovation that might be of interest. IBM's entry into in-line processing, the RAMAC era; IBM's entry into word processing, while it isn't computing, it's a version of information processing that is worthy of note. The glamour, I guess, is in the electronic magnetic tape data processing leading to the marvelous present-day computers. It's the thing that's written about most and talked about most, I suppose, but there are other important tangents of development that IBM embarked upon.

TOMASH: Well, perhaps it's true. It's been a long session and very fruitful. Maybe the thing to do is try to pick up again another time when we're all fresh. Do you have anything, Roger, before we go?

STUEWER: I'm almost tempted to ask you what would ordinarily be the historian's first questions: Namely, yourself--you graduated from Iowa in 1935. What was your degree in, and were you the first of your family to go on to college, as many of us were? What is your own background? What is your degree in and how did you become an expert in, let's say, patent--really legal, highly legal matters? How did this all come about--in five minutes?

BIRKENSTOCK: Well, I was at the right place at the right time. I was the only one in my family to go to college. My parents were rather elderly, it so happened, when I was born. I lost them early. I went to college almost 100% on my

own, with some aid from my sister. I lucked into a job with IBM because I had done pretty well in college and I had the opportunity presented to me by Dean Phillips at the University of Iowa who had the privilege of designating a student for hire by the Northwestern Bell Telephone Company and he designated me. An IBM executive came through and ate in the cafeteria in which I was "working" the cash register. It was the Iowa Memorial Union. This IBM executive as he paid his bill gave me his card, and said, "Young man, I've been impressed by your manner. We're going to have some people visit the University in a month or so for interviewing, and I want them to interview you." With that he took my name down. Satisfied that I was all set with Bell I threw his card in the wastebasket. A month or so later, I got a call from Dean Phillips at noon while I was at work and he said, "Two men are here asking if they could interview you." I was concerned that the Dean might think I had gone around him looking for better than the Bell job. I was young and naive, and I said, "Dean, what should I do? I'm well set, thanks to you." He said, "I think you should interview them. You might like the job. You might like better what they have to offer. I don't know this company too well or what they might offer." (IBM was a \$20 million company in those days.) So the advice he gave me was to attend the interview. I did so and was attracted to what the IBM interviewers had to say, even though their offering salary was \$100 a month, and I was all set at \$125 with Northwestern Bell. I accepted the International Business Machine Company's (as it was known in those days) offer. What single thing that impressed me I don't know. I just made a very lucky decision I guess. Someone was watching over me.

TOMASH: What was your degree in?

BIRKENSTOCK: My degree was in the College of Commerce, School of Business Administration. I had majored in accounting and business administration and that seemed to be a desirable major for the IBM Company in those tabulating machine product days. And so I accepted the IBM offer and went to training school at Endicott for three months after which I graduated--I got \$100 a month. And I became a student salesman and soon a salesman in St. Louis. And I spent 7 years in the St. Louis office as a salesman/special representative. It seemed like eternity. And then I was promoted to Branch Manager for three years in Kansas City, and then from that assignment, I was brought into NYC and lightning struck. I was made General Sales Manager. And I told you about that. I told you I only

lasted a year--I was removed from my position on orders from T. J. Watson, Sr., picked up and dusted off by Tom Watson, Jr. and made later on his assistant. You asked how I got into patent work--I just evolved into it.

STUEWER: Basically self-education...

BIRKENSTOCK: Self-education. There was an elderly gentleman who was handling somewhat the outside submissions and the negotiations by Clem Ehert who was a one time executive vice president of IBM, and he was in failing health, and I was sort of taking over in my role as assistant to Tom Watson, Jr. and some of Mr. Ehert's duties. Mr. Watson, Sr. had the patent operations reporting to him because he always had a liking for patents and as T. J. Watson, Sr. grew more elderly, administration of IBM Patents operations was available and Tom Watson said, "Well, why don't you take it over?" Mr. Watson, Sr. had a key advisor, Mr. John Hayward, whom he looked to heavily. He was never employed as IBM's legal counsel. He was with Mr. Watson, Sr. at NCR and was his best man at T. J., Sr.'s wedding. Mr. Hayward was a prince of a man. I said to Mr. Hayward--This is a lot of responsibility and I know little about patent law. I had commercial law in college. Maybe I should go to Columbia University and take up law at night." He said, "The worst things you could possibly do!" He said, "Mr. Watson believes, and I support his belief, that a businessman is a better negotiator than a lawyer. And I think you should stay as you are. You'll learn. We'll teach you. We'll help you. I think that most patent departments suffer because they're managed by patent lawyers, and I think that you can infuse and inject what you've learned already, being a business manager, into the administration and the management of the patent department." This I think I did because when I took over the patent department it was filing patent applications at the burdensome rate of 44% of its engineering disclosures. At that rate and at the rate IBM was growing technically, if we kept filing at this 44% rate, we wouldn't have been able to employ enough patent attorneys in the United States to handle our work; besides, the cost of patenting operations was becoming very, very heavy.

So I infused into our patent operations some practical business logic. And we devised a secondary means that was available to us under the law of protecting our inventions called "Publications." We for example encouraged the

Patent Operations to gear toward Publications, and we finally got to the point where we were filing on about 11% of our inventions and publishing some 33% of our inventions and discarding the rest of them that weren't worthy either of publication or patenting. The publication concept and procedure gave us a statutory bar against somebody else patenting our inventions of lesser import had let us do a quality job on the more worthwhile inventions that would be important to IBM's future. The publications we made protected IBM against somebody else patenting and using against the company its less important developments. Now, that didn't take a mental genius, but it took some managerial acumen and I was there at that time--the right time at the right place, and it didn't take a great deal of ability to learn to be, because of my sales background, to be a negotiator. And I began to believe implicitly in Mr. Watson's philosophy that a businessman can be and is generally speaking a better negotiator than an attorney because he can reach agreement more quickly with the other side. Of course you always have the attorney behind you to keep you practicing sound legal principles, and when you finally reach agreement in principle with the other party, the lawyer can then play his very important role in finalizing and definitizing the agreement to make it legally binding and fully acceptable to both sides.

So, I just was, through the workings of the good Lord, at the right time at the right place, available to contribute to the development of a very fine business. These contributions, I found out as time went on, were during what was without doubt, the most exciting days of the IBM Company. Experience in this period preserved my continuity and enabled me to become an IBM Vice President in 1968--Commercial Development, a post I held until I phased into retirement in 1973.

STUEWER: Thank you very much for a marvelous basis for a further interview.

END OF INTERVIEW