CHEMICAL HERITAGE FOUNDATION

HERMAN FIALKOV

Transcript of an Interview
Conducted by

David C. Brock and Richard Ulrych

in

New York City, New York; Philadelphia, Pennsylvania;
and Boca Raton, Florida

on

24 September and 23 November 2009 and 27 February and 28 June 2010

(With Subsequent Corrections and Additions)

CHEMICAL HERITAGE FOUNDATION
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Chemical Heritage Foundation
Oral History Program
315 Chestnut Street
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HERMAN FIALKOV

1922 Born in Brooklyn, New York, on 23 March

Education

1941-1942 Studies in Mechanical Engineering, City College of New York
1943 Power Equipment Maintenance, Signal Corps, U.S. Army
1943 Fundamentals of Radio, Pratt Institute, Signal Corps, U.S. Army
1951 Bachelor of Administrative Engineering, New York University
1952 Graduate studies in Mechanical Engineering, New York University

Professional Experience

Emerson Radio Corporation
1941-1942 Assistant Mechanical Engineer
1946-1947 Mechanical Engineer

Signal Corps and Infantry, U.S. Army
1942-1946 Service

Mutual Broadcasting System
1947-1949 Engineering Department

Radio Receptor
1949-1951 Mechanical Designer
1951-1954 Chief Mechanical Designer

General Transistor Corporation
1954-1960 Co-founder and President

General Instruments Corporation
1960-1967 Group Vice President
1967-1968 Senior Vice President of Development

Geiger & Fialkov Fund
1968-1977 Partner

Aleph Null Fund
1978-1987 Partner

	Poly Ventures
1987-1997	Partner
	Newlight Associates
1997-2004	Partner

Honors

1945	Bronze Star and two Oak Leaf Clusters, U.S. Army
1947	Conspicuous Service Cross, State of New York
1968	Leadership Award, United Jewish Appeal
1978	Israeli Leadership Award, State of Israel Bonds
1980	Fellow, Polytechnic Institute of New York
1987	Special Recognition Award, National Engineer Week
1988	Builder of Technion, American Society for Technion
1988	Long Island Distinguished Leadership Award
1990	Tech Island Award, Long Island Forum for Technology
1993	Presidential Medal, Polytechnic University
1996	Distinguished Alumni Citation, Polytechnic University
1999	Ernst & Young Entrepreneur of the Year Award for Lifetime Achievement as a supporter of entrepreneurship
1999	Outstanding Mechanical Engineering Alumnus of the Century, Polytechnic University
2000	Alex Grunwald Award for Enhancing Long Island's Technology, IEEE Long Island Section
2001	Long Island Software Award

ABSTRACT

Herman Fialkov was born in 1922 and grew up in Brooklyn, New York. His father had emigrated from Russia to be a watchmaker but had lost sight in one eye, so the family lived on welfare during the Great Depression. Herman's mother had emigrated from what is now Romania to Canada, eventually meeting and marrying Herman's father in New York City. Always "a smart kid" who wanted to build a bridge across the Atlantic Ocean, Herman attended City College of New York, studying engineering. He left college to take a job with Emerson Radio Corporation. In 1942 he enlisted in the United States Army Signal Corps, but he was unable to obtain officer training there, so he transferred to the Aviation Cadet Program. The Cadet Program suspended their officer training and assigned Herman to the infantry, just in time for the Battle of the Bulge. When he was discharged in 1946 he went back to Emerson as a mechanical designer and to night school at New York University, where he took a degree in administrative engineering, the "administrative" part laying the foundation for his entrepreneurship. While at Emerson he acquired the nickname "Hammering Herman" for his handy way with a hammer, and designed a television antenna for his first patent. From there he went to Radio Receptor Corporation. Seeing a market for transistors he founded General Transistor Corporation, whose first major customer was UNIVAC. In 1960 General Transistor Corporation merged with General Instrument Corporation and began making integrated circuits. Then Fialkov started a microelectronics division, which was eventually spun off into Microchip Technology, Inc. He next ventured into cable television, convincing General Instrument to purchase Jerrold Electronics. Jerrold, through several incarnations, has evolved into Comcast.

Fialkov invested in Arthur Rock's venture capital firm, Rock and Davis, and became intrigued by venture capital. He founded his own venture capital firm, Geiger and Fialkov, with Richard Geiger, and specialized in startup companies. He ended that firm and set up Aleph Null and PolyVentures. In the last fifty years his personal and venture capital investments have financed the startup or early development of many important companies, including Intel; Teledyne; Electroglas, Inc.; Standard Microsystems; General Signal; Globecomm Systems; and several Israeli companies. He details the beginnings, the spin-offs, and the present statuses of these companies and the people involved. He recently retired from eight companies and three philanthropies, retaining only his position on the board of InEnTec. He is fascinated by InEnTec's attempts to develop a process that turns municipal waste into energy and hazardous waste into building material.

Technology and electronics fields developed extremely rapidly, and Fialkov took more classes to learn about licensing and patents. In the early days one obtained patents to exchange, later for revenue. Fialkov describes the cyclical nature of business and the general economy, saying that recessions come and go and that an investor must be patient. He explains that a successful venture capital firm can expect 30% failures, 30% average performers, 30% moneymakers, and 10% wild successes. He attributes his choice of venture capital area to his love of technology, a "vibrant, changing technological environment."

Fialkov talks throughout the interview about his method for choosing worthy companies; the importance of assessing the market and correctly evaluating the people involved; several people who inspired or impressed him; his grandsons' entry into venture capital, one with startups and the other with developed companies. He loved his work, saying he could have retired at forty but did not want to give up the "fun" he was having. Though he now lives in

Florida, he says he never changed his domicile for a job. He has been lucky, he claims, and he is glad to be able to continue to engage in several philanthropic endeavors. He loves his family and is proud that his grandsons have followed him into venture capital. His contributions have been honored many times. He never did build a physical bridge across the Atlantic Ocean, but he knows that he certainly built a bridge with his support of communications and technology.

INTERVIEWERS

David C. Brock is a senior research fellow with the Center for Contemporary History and Policy at the Chemical Heritage Foundation. As a historian of science and technology, he specializes in the history of semiconductor science, technology, and industry; the history of instrumentation; and oral history. Brock has studied the philosophy, sociology, and history of science at Brown University, the University of Edinburgh, and Princeton University.

In the policy arena Brock recently published *Patterning the World: The Rise of Chemically Amplified Photoresists*, a white-paper case study for the Center's Studies in Materials Innovation. With Hyungsub Choi he is preparing an analysis of semiconductor technology roadmapping, having presented preliminary results at the 2009 meeting of the Industry Studies Association.

Richard Ulrych is the director of institutional grants and strategic projects at the Chemical Heritage Foundation.

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INTERVIEWER: **David C. Brock and Richard Ulrych**

LOCATION: **New York City, New York**

DATE: **24 September 2009**

BROCK: […] Perhaps we can just begin at the beginning and talk about your family background [and] youth.

FIALKOV: Well, family background…of course. I was a youngster during the Depression. My father had been a trained watchmaker. Before I was born he lost the sight of one eye and had to give up his trade. So, during the early years, the family was on welfare. I did very well in school. I had an older brother, who didn't do very well, and a younger sister. Both of them are gone. I did very well in high school. I went to a high school called Eastern District High School in Brooklyn, [New York], and was head of the Arista Society, which was the honor group in high school. [I was a] member of the math club and the science club, all that sort of thing. [I was] a member of the math team—the high school had a math team. [I] graduated in 1938.

BROCK: Did you grow up in Brooklyn?

FIALKOV: I grew up in Williamsburg, Brooklyn.

BROCK: […] Your parents were originally from Brooklyn as well?

FIALKOV: No. My father was from Russia, from a town called Pinsk, [Belarus]. My mother was from Austria-Hungary, in a town which is now in Romania called Suczawa,[1] something like that. I'll get it for you. It's spelled differently in different languages, but in the Carpathian Mountains. [My father immigrated] to New York, where he established a watch making business, [and] my mother to Canada, where her relatives were. She ultimately came to New York, met my father on the east side of Manhattan, [New York], married in 1918, and moved to Williamsburg.

[1] Today Suceava

I lived there until I left home to get married. I was married at the age of twenty. I had been going to CCNY [City College of New York] full-time and left when I found a job and was able to get married.

BROCK: Were you studying engineering at CCNY?

FIALKOV: Yes. I think I was at CCNY two and a half years, at the time I left.

ULRYCH: How is it that you came to study […] engineering? How is that you chose engineering as a field?

FIALKOV: I chose engineering because my favorite toy was an erector set, [and] I planned to build a bridge across the Atlantic Ocean. I ultimately did, but it was a communication bridge. Of course, I invested in quite a few companies using satellite communications. So I studied engineering and left after two and a half years. At the same time that I was preparing to get married, I enlisted in the [United States Army] Signal Corps Reserves. Because I was a very smart kid with a high IQ, I thought I would become an officer. They said officer's training would be available, and, of course, it was a phony promise. […] So, I was married in November of 1942 and was called to active service [in] June of 1943 […]. I had taken courses in the fundamentals of radio that the Signal Corps Reserve had sponsored. I spent two semesters [on] the fundamentals of radio at the Pratt Institute in Brooklyn and was at the top of my class, for something that I would never use—vacuum tube technology. So, I went to the Signal Corps I had Signal Corps training at Camp Crowder, Missouri, where I was a power equipment maintenance man. I completed a course in power equipment maintenance—that is providing the electricity for wherever we were located.

BROCK: Whatever sort of signal installation.

FIALKOV: For whatever communications had to be done and so forth. However, I had an Army General Classification [Test] score of 151. You needed 110 to become an officer. So, I wanted to become an officer. Signal Corps Officer Training was closed, so I transferred to the Aviation Cadet Program and was sent to basic training in a camp near St. Louis, [Missouri]. Then moved to Washington University in St. Louis where they gave pre-aviation cadet training, and I was doing very well.

However, some months later, although I was doing very well in classes, they decided that our training would be completed after the war was ended. So, anyone who had come in from other than the Air Corps—the Air Corps wasn't a part of the U.S. Army—was transferred to the infantry. So, I had basic training in the Signal Corps, in the Air Corps, and the infantry. I

was transferred to a Mississippi camp (I'll think of the name in a minute) and had basic training, and went overseas with the infantry in December of 1944.

We landed in Marseille, [France], and camped, moved in cattle cars up to the front, and they didn't even wait for our division to assemble before they moved the regiment up and assigned us to […] another division. I had been in the 63rd Division, [but] we were assigned to the 100th Division, because the Battle of the Bulge had started and the 100th Division was on the flank and needed help.

ULRYCH: You were part of the [General George S.] Patton group […]?

FIALKOV: [General Alexander McCarrell "Sandy"] Patch—I was in the Seventh Army. […] General Patch was there. So, […] I saw combat in January […] on the flank where the Germans had—[…] really I think they were probably Hungarian or Romanian troops at that part—were attacking. We had some casualties, but we survived […]. We had camped someplace across the Blies River, where most of our activity was patrolling. [Some of] our activity was communications. We laid telephone wire, and we also had a walkie-talkie—I was the fellow with the walkie-talkie radio, of course, with my training in electronics. I got my picture in the history books. […] When we attacked the Siegfried Line successfully and the armor had passed through and we were waiting on the other side, a Signal Corps photographer came up and asked us to pose on the Siegfried Line as if we were approaching. We did, and it got into a bunch of different history books.

ULRYCH: Oh, that's very good.

FIALKOV: […] When I crossed the Siegfried Line […] I got my pants caught in the barbed wire [among the dragon's teeth]. A fellow sergeant called Tom Quinn cut off the leg of my outer pants. We had regular inner pants and then waterproof pants on the outside. You could see me standing there with the radio on my back, and with the outer pants missing on one side [(that's how you can tell it's me in the photo)]. After that, we continued to attack after the Siegfried Line. We continued to attack until essentially the war was over. I have three Bronze Star medals, and a couple of other medals for where I was [and] what activity I was [in], but I'll give you a list.

BROCK: From that experience of the Battle of the Bulge […]?

FIALKOV: No, from the entire campaign […]. I was only in combat about four months and there were maybe several skirmishes and about four major battles during that time. The Division actually had about 50 percent casualties.

BROCK: My goodness.

FIALKOV: Not all killed, but casualties. I was one of the survivors. […] I was in a rifle company, and I was a captain's messenger. I had to stay near to him with a radio. The captain got killed, but I survived. After the war, I was let out at the beginning of February 1946. The war ended in Germany in May of 1945, I think. […] Our Division was scheduled to go to Japan, but fortunately the atom bomb struck first and that was canceled. So, we had to wait until we had enough points to be sent home. I was sent home at the beginning of February with an Honorable Discharge. Within a week, I was back at work at Emerson Radio [Corporation], which was the company I was working for when I left, and back in school at NYU [New York University] in the evenings at their uptown campus in the Bronx, [New York].

The interesting part is they went through my record at CCNY in order to give me a […] certain amount of credits towards a degree. […] An interesting story, because this is the Chemical [Heritage Foundation], is they gave me credit for one semester of chemistry. So, when I came back to NYU in the evening, I had to finish the second semester of chemistry. I did very poorly on the final exam because the exam covered both semesters, and I had forgotten what I had learned in the first semester. The only grade below an "A" or a "B" I got in CCNY and NYU was a "D" in chemistry. I still made it to the top five percent of the class.

I was in the Tau Beta Pi, which was the engineering society, and Alpha Pi Mu, which was the industrial engineering society. The course I took at NYU and the degree I achieved was called Bachelor of Administrative Engineering, because it included all the basic engineering courses, plus marketing and accounting, and all the business courses.

BROCK: Interesting.

FIALKOV: They gave me a choice of either getting an industrial engineering degree or the administrative engineering degree. I took the administrative engineering degree. I was also an engineer. I was working as an engineer at the time, and I wanted to be a chief engineer, so I took the right courses for later entrepreneurship.

BROCK: At Emerson Radio, that was the job you had left to go to CCNY, is that right […]?

FIALKOV: I didn't leave until I went to war.

BROCK: I see. [So] you were both working and going to school then?

FIALKOV: Right.

BROCK: Okay. […] What were you doing with Emerson? Could you [describe the]…?

FIALKOV: I was a mechanical designer. They [had] electronic designers. I had to design the chassis, tell them where to put the parts, [had to] learn where which parts go with other parts, and design the cabinets. Before the war I was working on mostly military equipment. I got the nickname "Hammering Herman," because when they had trouble fitting the chassis into the external—it didn't fit too well—I used to go up in the front on the production line with a hammer and hammer a few areas, and it went in […]. After the war of course, they became involved in television and they chose the wrong kind. I was working on the television where you have a rotating color wheel, called a CBS-type television. At any rate they ultimately changed over to ordinary television sets.

The first patent I got was [when] we were manufacturing television sets for Sears, Roebuck [and Co.], and their engineers decided that they could make a loop of wire, connect it to the tuner, and you would get some kind of poor reception. So, you could buy a television set, and it would have a built-in antenna. Now, fooling with a piece of wire in production wasn't my idea of decent production. So I decided to get cardboard covered with aluminum, and stamp out two rings. […] The inner ring was on one and the outer ring on the other—suitable for that lousy reception. I went to a manufacturer [Meyer Lansky] who stamped them out and he said, "Herman, why don't we patent this?" I said, "I can't patent it. My company owns the patent." So, he said, "Ask them if you can patent it." So, I asked them. I asked the head of the company, and he said, "Are you kidding? Have you seen that lousy picture?" So, [Meyer] patented it, and this stamping company wound up with about five [salesmen] making a living selling it to every television manufacturer in the country. So, that was the lesson—it didn't have to be a wonderful idea, but there was a market at that time for it. Because it cost peanuts and the competition was an electronic piece of equipment that cost twelve dollars.

BROCK: Did you receive royalty on their sales, or…?

FIALKOV: He sent me presents every Christmas. But it was a lesson, because later, I really [got into] patents when I started Standard Microsystems [Corporation]. Because we had some terrific patents, and we got a lot of money from licensing them. I took courses in licensing. Of course, in the early days of Standard Microsystems I was president, and then later chairman, then later vice chairman. […] When I finished the undergraduate work at NYU I [took] a course in patenting post-graduate. I did about a year of post-graduate, mostly in math and that sort of thing.

Interestingly enough, I didn't pay any tuition for college. City College was tuition free. NYU was on the GI Bill of Rights.[2] The post-graduate work was on a state scholarship. So, having been through paying for four grandchildren to go through undergraduate work—the last one was about fifty thousand dollars a year. My granddaughter is in her final semester. Her brother and the other grandsons are much older. But, I'm glad that the tuition business is over.

BROCK: So, when did you finish at NYU?

FIALKOV: I graduated in 1951. […] They graduated the evening class separately. There were only a hundred and five graduates, and I was fifth in the ranking. I was an officer of the school Tau Beta Pi, and an officer of the school Alpha Pi Mu, which was the industrial engineering honor society. […] Going to NYU at night, I met someone who found me the job at Radio Receptor [Company, Inc.], but the "D" prevented me from getting honors when I graduated. We couldn't have one "D." Of course, when I was young, I was not assertive enough to say, "You asked me questions on something I took four years ago, and it's nothing you covered during that semester."

ULRYCH: You weren't expecting it on the exam either […].

FIALKOV: Yes. I actually got an "A" in chemistry lab and a "D" on the final exam. So, that's why I say chemistry was not my best subject.

BROCK: […] Where were you living in those years after you got back from the war […]?

FIALKOV: When I got back from the war, we found an apartment in Coney Island, Brooklyn. [We] lived there for a few years before—I commuted to NYU from there—[we] moved to an apartment development in Bellerose, [New York], which is at the border of New York—of Queens and Long Island. So, I was living there, also commuting to school, and also commuting to Radio Receptor from there.

BROCK: Now we talked earlier, [and] you gave a very nice description of Radio Receptor earlier before we had the recorders on. I was wondering if you could […] describe it again.

FIALKOV: Radio Receptor was started by two gentlemen, Hugo Cohn and Ludwig Arnson. At the time I was there, they gave us incentive stock options hoping that they would be able to

[2] U.S. Servicemen's Readjustment Act of 1944, P.L. 78-346, 58 Stat. 284m

go public. Their lawyers were urging them to get into some kind of liquidity. At that time, Hugo Cohn was sixty-five and Ludwig Arnson was seventy and they were concerned about having liquidity in their estate. So, we thought our options would be worth something. They had investment bankers marching through.

Of course I was anxious for them to go public as well. They never did go public. After we […] had some success at General Transistor [Corporation], they decided to go out of the transistor business. We bought up their inventory and were able to test it and sell a good portion of it to American Machine & Foundry [Company]. It was a major customer then.

But when I started General Transistor, the major partner was a fellow named Eugene Kral. He was a quartz crystal manufacturer. He had a garage [next] to his plant, which he turned over to General Transistor. There, with a couple of his assistants, we built crystal pullers [and] we purchased the boats on which we made the transistors, and we made transistors. […] He couldn't sell them […]. We sampled lots of people, but there were no orders.

BROCK: These were germanium alloy transistors?

FIALKOV: Yes. He had spent about seventy thousand dollars, and he told me, "Herman. We got to sell the company. I mean, I can't keep putting more money into this." We found a buyer, an American Stock Exchange company […] in a very unrelated business, who thought if they went into transistors their stock would behave properly. So, they bought him out for their stock, his seventy thousand dollars. They bought him for their stock. The name of the company was Jerry O'Mahony, Incorporated.

BROCK: I haven't heard of that.

FIALKOV: Jerry O'Mahony, Incorporated had two divisions. One made truck bodies, and the other one made diners…the diners you eat in.

BROCK: Sure.

FIALKOV: And they kept paying the bills as we were struggling. Finally, they came to the point where they said, "Herman, we better sell the company." They also saw [we] were sampling and sampling, and business was almost nonexistent. So, we went to the people, the employees of the company, and we said, "Let's make them an offer and buy them out." We came up with a plan of buying them out for ten thousand dollars, where each of us would put in twenty-five hundred dollars. We found an outside investor, a lawyer, who had made a lot of money from what is called "spike suits."

BROCK: I don't know what that is.

FIALKOV: [You] don't know what a spike suit is?

BROCK: No.

FIALKOV: […It's] where you sue a company on behalf of the stockholders. All right? He agreed to match our ten, and to lend us another ten.

BROCK: So, you along with the other employees were going to buy out this other company.

FIALKOV: He got 50 percent of the company. And the employees—I think the lawyer who we hadn't paid to incorporate the company, we gave him 2 percent of the company—and the other 48 percent we shared, 12 percent to each of us. The lawyer ultimately got paid four hundred thousand dollars for his 2 percent. At any rate, almost immediately we started breaking even. The tide turned and UNIVAC became a major customer.

BROCK: For both transistors and diodes?

FIALKOV: Just transistors.

BROCK: Just the germanium.

FIALKOV: That was the major business.

ULRYCH: [Was that…] because the business environment changed? [Suddenly there was a bigger] demand than existed before?

BROCK: I guess.

FIALKOV: And what Remington Rand decided to make is a hybrid computer with vacuum tubes and transistors to, sort of, get their feet wet in transistors. We were supplying them with the PNP transistors and Raytheon [Company] was supplying them with the NPN transistors. I ran there every month, and finally they were all very sullen. They said, "Raytheon can't supply the transistors." So, I said, "I'll make them." They said, "But how long will it take?" I said, "Give me a month." And they laughed. They said, "Raytheon [said it would take] three or four months for delivery […]." We delivered it in a month.

BROCK: Now was that a big change in process to make an NPN?

FIALKOV: Yes! It's different alloys.

BROCK: So, you were using indium?

FIALKOV: We used indium for PNP.

BROCK: And what did you use for the NPN, do you recall?

FIALKOV: I don't remember. I'll look it up. We had a chief scientist, fellow named Bernie Jacobs, and a good production fellow named Bernard Cohen, who was one of my partners. They did what they had to do to make them. […] Remember that transistors that were made in those years were not super reliable. We didn't know the complete physics of it. We did the best we could, based upon the knowledge we had. But, the FILE computer filled up a room this size. Maybe two years later, [UNIVAC's] top engineer left, and also one of their top executives left to start Control Data [Corporation]. […] Control Data asked us to design a faster switching transistor, which they needed for their computer. They had a fellow who was really a big name (and I'll think of his name in a moment) in high speed computers. Control Data was a successful company, and we were successful with supplying them with different transistors. Of course, a couple years later, they went to silicon. But we went public in 1956. It took four investment bankers to raise three hundred thousand dollars to sell a hundred thousand shares at three dollars apiece, and we became public. We sold a third of the company for three hundred thousand dollars.

BROCK: Now, by 1956, when you went public, you had […] done the employee buyout obviously.

FIALKOV: Yes.

BROCK: And then you had also started to deliver these germanium transistors to UNIVAC and to Control Data, too…

FIALKOV: Yes. And we were a growing company. I made a speech before the Society of Security Analysts. I probably have a copy of that someplace.

BROCK: That would be very interesting.

FIALKOV: We were in business.

BROCK: Now was that how you came into contact with Hayden Stone [Hayden, Stone & Co.]?

FIALKOV: We came in contact with Hayden Stone later. They became our investment banker […] when we sold stock privately at higher prices. Arthur Rock was the young contact at Hayden Stone. We had a fellow from Hayden Stone on [our] Board of Directors.

BROCK: Who was that? Do you recall? Was it [Alfred] "Bud" Coyle?

FIALKOV: No, it wasn't Bud Coyle, but I knew Bud Coyle very well. It was an elderly gentleman. I'll get it. I'll get you all that information.

BROCK: So, that was in 1957 when you were doing those private sales?

FIALKOV: […] Probably. The stock ultimately reached a high of ninety dollars a share.

BROCK: Wow.

FIALKOV: We split it two for one. Then we merged with General Instrument [Corporation] in 1960. In the meantime, General Instrument had acquired Radio Receptor. So, my history going back was with one company, although there were three different companies. […] An interesting sideline over here. [An] executive of General Instrument at that time, I think he was

executive vice president, later president, was a fellow named [Moses] "Monty" Shapiro. He had been a labor lawyer at Emerson Radio. I went back there after the war […], and when I went back, an engineers union had taken over. Of course, they gave me a raise. I asked my boss. He said, "Join the union. It's no problem. We're doing well with them." So, I joined the union. I was a member of the FAECT, Federation of Architects, Engineers, [Chemists, and Technicians…]. A year later, they wanted to cut the supervisory engineers' salaries. The supervisory engineers decided to talk to the union. When they heard that, [they] went to their labor lawyer, Monty Shapiro. The result was, of thirty-three engineers, they laid off twenty-eight, including me.

BROCK: Wow.

FIALKOV: This was a company that had never laid off an engineer before. So the Monty Shapiro who had me leave a life-long job at Emerson Radio, wound up as my supervisor at General Instrument. […] Of course, I was also on the Board of General Instrument after the merger. So, I was in a position of some power other than just […] running the semiconductor operation.

At any rate, at General Instrument we set up a facility in Woonsocket, Rhode Island where we manufactured all the germanium diodes as well as alloy transistors. General Instrument had had a rectifier division in Newark, New Jersey. We combined our rectifier [operation with the one] in Newark. So, I had an operation in Woonsocket, Rhode Island; I had an operation in Newark; and an operation in Long Island.

BROCK: Now where was General Transistor in 1954 up until the time of the combination with General Instrument?

FIALKOV: Where was General Transistor…?

BROCK: Located.

FIALKOV: We were in about four locations in Jamaica, Queens [New York]. […] The garage wasn't big enough, so we found a place in Richmond Hill, [New York]. […] We bought a building right next to the Long Island Railroad Station. The headquarters was in the original plant on Sutphin Boulevard in Jamaica.

BROCK: […] Was Emerson Radio also in Brooklyn?

FIALKOV: No. Emerson Radio, when I joined them was on 111 8th Avenue, New York, which is, I believe, either 34th and 8th Avenue or 35th and 8th Avenue. But, when I lost my job at Emerson, I found a job at a higher pay on Wednesday of the following week. They gave us one week of severance pay. I found a job at Mutual Broadcasting System [(MBS)], which was a great job for going to school, because it was like a thirty-five hour week, and no pressure. […] I was in charge of making maps of the AM coverage of all the radio [stations—about four hundred—and their associated broadcasting].

BROCK: [In the] network.

FIALKOV: So, I prepared each page of that book. But I had manufacturing in my blood, and I wanted to get back. A spinoff from Emerson called Teletone Radio [Corp.], which was […] at that time located on about 60th Street and 10th Avenue in New York, making television sets and radio, phonograph changers and so on, and a fairly successful company. I got a job there doing my design work that I loved. They ultimately moved to Elizabeth, New Jersey, and I worked in Elizabeth for some time. [But] then I was going to school, and I had this offer.

BROCK: With Radio Receptor?

FIALKOV: With Radio Receptor, which was a much better commute. I took the Staten Island ferry before the bridge every day to get to Elizabeth.

BROCK: It's interesting to me just that, you know, [there were] so many electronics-related manufacturers in Brooklyn [and] Manhattan, in this time.

FIALKOV: There were at that time […].

BROCK: It's very [interesting]. It's not something that people think of today, at least not me.

FIALKOV: No, because the television industry died in America, and all the electronic equipment industry died in America. There's very little made. But that was it. […] I actually got the job at Emerson through the placement office at CCNY. Of course, I went right back to Emerson after the war. I worked for Teletone until I left to go to Radio Receptor. I enjoyed that work. They gave me two opportunities: either go as chief mechanical engineer to the television tuner division, or to semiconductor division. But we saw that semiconductor people were in

such demand that I figured that would be a better choice, and that's how I wound up in semiconductors […]. With a chemistry textbook that's worthless. [laughter]

BROCK: So, in the run between 1954 and 1960, with the high speed germanium alloy transistors, was your major [competition Raytheon]?

FIALKOV: They went out of them.

BROCK: They got out. […] Was Philco [Corporation] your major competitor then during that time?

FIALKOV: Philco was a competitor. They had a wonderful switching transistor. They had built it on automatic equipment, and General Transistor became a licensee.

BROCK: Of this MADT [Micro Alloy Diffuse Transistor]?

FIALKOV: Of Philco. MADT. We started making MADT transistors.

BROCK: Did you use this electrolytic etch thing that they did?

FIALKOV: We used the equipment. We used their process, because we wanted to stay in fast switching transistors. So, we were making MADT transistors, but of course, that was great until silicon came into the picture. […] When we merged with General Instrument, we were making MADT transistors. […] The important fellow at Philco at that time was Bob [Robert H.] Noyce.

BROCK: Let's see. So, now, I think I read somewhere that there was a group that actually left General Transistor?

FIALKOV: There were several groups that left.

BROCK: And one group left to get into the silicon. Is that right? Or could you describe the…?

FIALKOV: Several groups, none of which became very major. […] There was one called Industro [Transistor Corp.], and another one called…hard to remember. But […] quite a few of our engineers left to start competing companies, but not really in what we were doing. […In] General Instrument I started a microelectronic division. I went out to the west coast, and I got the best engineers I could in microelectronics and we started a microelectronics division at General Instrument.

BROCK: At General Transistor first or…?

FIALKOV: After the merger.

BROCK: After the merger […] you started a microelectronics program.

FIALKOV: Yes. And that microelectronic division was ultimately spun off as Microchip Technologies [Incorporated], which is a company now in Arizona, I think with a capitalization of over a billion dollars.

BROCK: When was that spinoff?

FIALKOV: I don't really remember when, because it was after I left General Instrument.

BROCK: Okay.

FIALKOV: General Instrument ultimately was sold to Motorola, [Inc.].

BROCK: I didn't realize that.

FIALKOV: The reason they were sold is, of course, they were a major factor in cable television. Now, in 1967, I left the semiconductor operation, which was now doing about 35 percent of General Instrument's business. They also made components for radio and TV. I became senior vice president involved in making acquisitions. I subscribed to all the information I saw was coming. I saw cable television was coming. I found a cable television company in New Jersey that I wanted to buy. I went to my boss, Monty Shapiro, and said, "I want to buy that company." He said, "Who's the leader in the field?" I said, "Jerrold [Electronics Corporation]." He said, "Buy Jerrold." So, I bought Jerrold. That made General

Instrument a major manufacturer of TV boxes for cable […]. And that's what they sold to Motorola. See, they spun off the semiconductor division and they sold the cable operation, which had then grown very tremendously, because when I bought Jerrold, and Jerrold was outside of Philadelphia someplace…

BROCK: I think lower Bucks County from what I saw. .

ULRYCH: Yes. Bucks County.

FIALKOV: And so, I went there and I convinced them to sell. I was involved in the legal activities in buying them. General Instrument stock went up to around sixty-five dollars a share from much lower. They were good times until the recession in 1972, when General Instrument stock was down to four dollars.

BROCK: Oh, dear.

FIALKOV: There have been recessions before. Monty Shapiro called me and he says, "The stock is down to where I paid for it." But he gave me some good advice [I] have held onto. He said, "Whenever you've got a lot of stock in some company hold onto it. Never sell." Unfortunately, we sold Intel [Corporation] a lot too soon at Geiger & Fialkov. As a matter of fact, we sold it to help keep supporting Standard Microsystems. We needed money. So, Intel helped Standard Microsystems move along.

BROCK: To go back to that move into microcircuitry around 1960, […] did you also organize a simultaneous move into silicon?

FIALKOV: Oh, yes, absolutely. I mean, silicon was the business. […] I think we still sold germanium diodes at that time, and we moved that plant from Woonsocket to Taiwan. We were the first electronic manufacturer in Taiwan, [that is], General Instrument [was]. When I left General Instrument, which was in 1968, to start a venture capital fund, we had ten thousand employees in Taiwan.

BROCK: And you were doing both manufacturing and assembly there?

FIALKOV: Right. But not only of transistors—[…] all of our other components were made there too.

BROCK: Oh, the television equipment, etc.

FIALKOV: Yes. All the components.

BROCK: Wow.

FIALKOV: I think it cost like twelve cents an hour for labor there at that time. Quality control was very cheap. You had as many bodies as you needed to make sure everything was good. So, we were the beginning of farming our labor offshore, especially in the electronics industry. […] The people who told us to do that were the Boston Consulting Group [(BCG)]. Heard of them?

BROCK: I have heard of them before.

FIALKOV: They had some great people. They gave some very good advice.

BROCK: Had they had experience moving manufacturing to different countries previously?

FIALKOV: I don't know that they had, but they knew. [They saw] the handwriting on the wall.

BROCK: They saw that trend.

FIALKOV: I forget the name of the head guy. I'll find that too.

BROCK: I had two questions about the move into microcircuitry.

FIALKOV: Yes.

BROCK: One was, what were you seeing that prompted you to say this is something that General Instrument's semiconductor division should get into […]?

FIALKOV: That was the future. […] It was the beginning. It was the beginning of microelectronics. I actually have a pen stand at home with a plaque inside with a *Barron's* article where I had predicted this is the turning point for microelectronics.[3]

BROCK: Right around this time?

FIALKOV: Yes.

BROCK: 1960.

FIALKOV: I'll send you the packet.

BROCK: Or just the citation—either one would be great. So, the reason I asked the question is […] that you got into it earlier than a lot of other people did.

ULRYCH: So, you saw something other people didn't see.

FIALKOV: We did.

BROCK: So, I was just wondering what your experience was that…

FIALKOV: […] We got into it because we had a patent on something called COPLAMOS.

BROCK: […] I don't know what that is.

FIALKOV: No. [It was based on Paul Richman's patent. He and I were cofounders of Standard Microsystems]. At that time, Intel was making a chip—a memory chip, a very basic memory chip—and we decided to make a memory chip four times larger with [Paul's] new COPLAMOS process. We did, but we were such a small company that the people would rather

[3] Herman Fialkov, "Burning Up the Circuits," *Barron's National and Financial Weekly* 45(32) (August 1965): 3, 13.

wait for one of the large companies to come up with it, where they wouldn't be taking such a chance. So we never got into the memory business at Standard Microsystems. […] We licensed [COPLAMOS] to IBM and to Intel, and [there's] a very close relationship between Standard Microsystems and Intel. Intel is a stockholder in Standard Microsystems.

BROCK: I didn't realize that. When did Standard Microsystems start?

FIALKOV: Nineteen seventy-two. There was a company spun off from General Instrument called Solid State Data Sciences. They were in trouble. I invested in them because I wanted to save that section that Paul Richman was running. But they ran out of money, and when they did run out of money, I hired Paul Richman. One of my other venture capital activities was a company called Micro Semiconductor Corporation [(Microsemi)]. They're still public. But we started that in my venture business.

I was chairman of the board and we had the president buy or employ this group of people to start Standard Microsystems. So, Microsemi was the original owner of Standard Microsystems. Ultimately, they were able to sell enough stock to help them grow and they're a very major company now in components for the automotive field and so on. They're [NASDAQ symbol is] MSCC on the Over-the-Counter. So that company and Microchip Technologies are based on stuff I started.

BROCK: To go back to something that you mentioned about getting General Instrument into the whole early microcircuitry game, you mentioned that you went to the west coast and hired […six people]. Could you describe them and where you found them?

FIALKOV: One fellow's name was [Frank] Wanlass. He was a genius. […] A whole bunch of them were Mormons. We actually set up a laboratory in Utah…

BROCK: […] I saw that. I was wondering why Utah. Now, there's the answer.

FIALKOV: …to make these people happy.

BROCK: Now, Frank Wanlass […] was at Fairchild Semiconductor?

FIALKOV: […] We hired people from Fairchild. We hired six people to start the operation. They all came from the west coast and we brought them to New York to Long Island. We hired a professional to manage the microelectronics division. But shortly after that, I left General

Instrument. When I started General Transistor, Monty Shapiro said, "You're crazy. Why are you starting another company?" But…

BROCK: I was also curious about some of the…I guess about the location of some of the General Instrument's semiconductor divisions' locations. So, Woonsocket, Rhode Island?

FIALKOV: Well we consolidated all the Jamaica plants into one in Hicksville, Long Island, [New York].

BROCK: And why did you move it to Long Island?

FIALKOV: Because it was only a five minute commute.

BROCK: From where you were living?

FIALKOV: Yes. It was very convenient, and for other executives as well who were commuting to Jamaica. I think that plant is still in existence. I don't know what they're doing. But, it was in Hicksville, Long Island. A very nice plant. We built a new plant there, with a garage and everything.

BROCK: What about Woonsocket? […] Why did you put an operation in Woonsocket?

FIALKOV: We went to Woonsocket because I think we were able to get a hundred and fifty [thousand] square foot plant for fifty thousand dollars. […] When we went over there, before we opened it up […], a line started forming looking for jobs. […] The textile mills had left. So we converted an old textile mill, right next to its waterfall or whatever, into a transistor and semiconductor plant.

BROCK: I guess that's what Sprague [Electric] had done in North Adams, [Massachusetts…].

FIALKOV: Yes. It was just very cheap [then]. The Rhode Island governor was happy to help us with [loans] or whatever. The banks were very generous. They were looking to get people to work. Unfortunately, the people in Woonsocket were all ex-French Canadians. [They had a] tough union. That's why we ultimately left.

BROCK: Then you moved the operation to Newark, [New Jersey].

FIALKOV: To Taiwan.

BROCK: Oh, I see.

FIALKOV: Because Monty Shapiro was a labor lawyer, and he didn't like tough unions.

BROCK: I noticed two things in reading about [and] looking into General Instrument's semiconductor activities. One was this very robust business that it had in multi-chip or hybrid microcircuits.

FIALKOV: We had a hybrid division. We had started that before we started the microelectronics operation. [But] it was a separate division. Jerry Fishel, who ran that at General Instruments, started a company on Long Island that had some successful years making hybrids. I don't think General Instrument really made a big deal out of it.

BROCK: It seemed to be […big] for the, maybe, 1960 to 1964 or 1965 period […].

FIALKOV: It was before Micro Semiconductor. Right. Yes, I remember starting that. But it never was very large.

BROCK: It's interesting to me that that whole area of hybrid circuits or multi-chip circuits is an area that did have some prominence in the first half of the 1960s. That people now don't really remember that. [There] was a vibrant business [in] these hybrid circuits.

FIALKOV: Yes, that's right.

BROCK: When you say it wasn't very big, was that because [these were primarily] going into government products or military products? The other thing I was struck by was…we've mentioned Frank Wanlass and your sort of early and big bet on the MOS [metal oxide semiconductor] integrated circuit technology…

FIALKOV: Yes, that's because this Paul Richman was an early leader in MOS technology.

BROCK: Oh, okay.

FIALKOV: And this COPLAMOS process was a big advance in MOS technology. He's the author of several books on it.[4]

ULRYCH: Paul Richman?

BROCK: What was his background, do you recall?

FIALKOV: I think his group came from Sylvania [Electric Products, Inc.].

BROCK: Oh, Yes. That Sylvania operation at Danvers, [Massachusetts]…

FIALKOV: Sylvania had a laboratory in Queens.

BROCK: Oh, in Queens?

FIALKOV: In Queens some place…Bayside, I think, Queens. It was a laboratory. I mean they were research people, not production people. And those were the people who started that solid-state company that I brought into General Transistor.

BROCK: Okay. Another thing that I noticed was it seemed that by the time that General Transistor combined with General Instrument, it […] had some stakes in some other electronics-related firms.

FIALKOV: Semi-metals, a company called Semi-Metals, which sold silicon and germanium as well. That was a successful company. I think the company showed a profit in all but one year of its existence, but it was also not a major operation. The fellow who ran it, his father was

[4] See, for example, Paul Richman, *Characteristics and Operation of MOS Field-effect Devices* (New York: McGraw-Hill, 1967); and Paul Richman, *MOS Field-Effect Transistors and Integrated Circuits* (New York: John Wiley & Sons Inc, 1973);

a baker. He took his father to the plant and he showed him all these ovens. [The father] says, "It's just like baking." [laughter]

BROCK: And then there was also a magnetics company in southern California, is that right?

FIALKOV: We owned a magnetics company. We owned a company called Systematics, and we owned a magnetics company that made storage devices, rotating storage devices.

BROCK: Right, drum memories or [something]?

FIALKOV: Drum memory.

BROCK: Yes.

FIALKOV: I was an acquirer. [laughter] But that didn't amount to much either. It was a business for a while.

BROCK: […] Well, maybe we could then talk about…. […] I think it was around 1967 or so, […] when it looked like General Instrument brought in Bill [William C.] Hittinger…

FIALKOV: Yes.

BROCK: …as president, who was a semiconductor person.

FIALKOV: He was a semiconductor person. I had left the semiconductor operation in 1967.

BROCK: And you were doing the acquisitions job.

FIALKOV: I was doing the acquisitions. A fine fellow, but he had come from a background that really was not the kind of operation that General Instrument was. So, he had a lot of adjusting to do.

BROCK: He'd come from more of the Bell Labs [Laboratories]/government world or something?

FIALKOV: That's where he came from. Yes. A very, very bright guy.

BROCK: And so after doing the large acquisition of the cable TV company, why did you decide then to switch to venture investing?

FIALKOV: Venture capital. Well, I'd been an investor in Arthur Rock's Venture Fund. […] Davis and Rock. It looked very interesting. And a fellow I had gone to school with, Dick [Richard L.] Geiger, was also interested in that.

BROCK: Had you gone to NYU with him, or…?

FIALKOV: Yes. So, I teamed up with him and we raised seven million dollars and started Geiger & Fialkov, which was a lot of money in those days.

BROCK: […] How much did the both of you put into the fund?

FIALKOV: I put in a million dollars. Normally, the general partners put in one percent of the capital, but I became a limited partner as well. […] The reason I left General Instrument was because I was a very small cog in a big wheel. I don't know what percentage [of] the company [I] owned, but it wasn't a lot. I wanted to be where my money was.

ULRYCH: There was seven million raised total. Where else [did you get capital]?

FIALKOV: Some of the executives in General Instrument invested. Loeb, Rhoades [Loeb, Rhoades & Co.]…

BROCK: Who did?

FIALKOV: Loeb, Rhoades.

BROCK: I don't know what that is […].

FIALKOV: [It] was a major investment banker…

BROCK: Oh, okay.

FIALKOV: …[that] has since merged with one of the others that are still around […]. It's Loeb, Rhoades. And they were major investors in General Transistor and so they had a group who invested. […] One of their relatives was the famous Canadian […]. Memory is half shot for names, but I'll review it.

BROCK: Then some of the Fairchild founders were also investors.

FIALKOV: Yes. Jay [T.] Last was a founder, and who else?

BROCK: Jean Hoerni maybe, or…?

FIALKOV: […] Arthur Rock was an investor, and a fellow that Arthur knew very well, Serafin [Valdivia], do you know him?

BROCK: From Texas?

FIALKOV: Texas. He had Rice University invest, so we had a college investor.

BROCK: And you knew Jay Last both from being in the semiconductor world and […] through Arthur Rock?

FIALKOV: Through Arthur Rock […]. Of course, one of the other investments I had made was a company called Teledyne, [Inc.].

BROCK: Sure.

FIALKOV: And they became involved in semiconductors.

BROCK: That was Jay and Jean's…

FIALKOV: Yes. Right.

BROCK: Imelco, yes. So after raising that fund, what sort of deals did you do?

FIALKOV: Well, the first one was Intel.

BROCK: In Intel's first round?

FIALKOV: First round.

BROCK: Which must have been just at the time you were [setting]…

FIALKOV: Yes. So that was a pretty good start. [laughter] Micro Semiconductor was another major investment. They've done very well. It's now called Microsemi.

BROCK: So, were they all mostly semiconductor investments?

FIALKOV: Microsemi is semiconductor.

BROCK: Right, and Intel. Were you concentrating on [the] semiconductor industry?

FIALKOV: Well, that was the technology area I knew best. [I had] earlier been an investor through one of the companies I was involved in—AMI, American Microsystems, [Inc.].

BROCK: Which is an MOS…

FIALKOV: American Microsystems.

BROCK: Was that Howard [S.] Bobb?

FIALKOV: Howard Bobb. That was his company.

BROCK: That was a very big player in MOS for a while, wasn't it?

FIALKOV: Yes. We probably hired some people from them. […] I knew Howard, but [that had] been many years ago.

BROCK: For how long did that fund run?

FIALKOV: About eight years. It was a seven-year fund, and I think we extended it for one year. Then I started my own personal fund called Aleph Null [Corporation]. Aleph Null is a mathematical symbol [$_0$]. I don't know if…in the infinity math…

BROCK: I had to look it up on Wikipedia, I have to confess.

FIALKOV: They ran out of Greek letters. They were a major investor in Microsemi. A bunch of other electronic companies did well. I set that up, really, for my children, [where] I owned the preferred stock and they owned the common stock. When we closed it, they got all the profits.

BROCK: Then it was after that […] that you pursued this PolyVentures?

FIALKOV: Yes. Well, I went with the merger. They gave me a choice. PolyVentures…Brooklyn Polytech acquired the school I graduated from, and I had been through mergers. So, they offered me some kind of a diploma from Polytechnic, and I took it. I went on their board. I was on Polytechnic's board from around 19…about twenty years.

BROCK: I was interested in this venture fund, PolyVentures that you set up. Seems to be a collaboration with the university, or…?

FIALKOV: […] Yes. It was supposed to be, but it really was a favor to them.

BROCK: In what way was it a favor?

FIALKOV: Well, they made money on it. They made several million dollars.

BROCK: As an investor, essentially, in the fund?

FIALKOV: Yes. They had a general partner's portion, and that was a lot of money to them at that time […].

BROCK: Was that something new […]?

FIALKOV: Yes, it was new.

BROCK: It seemed like…it seemed like something new in venture.

FIALKOV: We thought that would be helpful to the fund, but it really wasn't. […] They were not like MIT where they spawned entrepreneurs.

BROCK: But the theory behind it might be that to take developments coming out of the university, they're going to get commercialized and have a venture fund right there…?

FIALKOV: They've done more of that out of Stony Brook [State University of New York, Stony Brook] than they did out of PolyTechnic on Long Island.

BROCK: Oh, interesting. So, all of these…all of your funds, were on Long Island.

FIALKOV: […] No, Geiger & Fialkov was in New York.

BROCK: New York, Yes.

FIALKOV: Manhattan. We were at One Rockefeller Plaza, and all the others were on Long Island. Close to where I live.

BROCK: And also […] what's interesting—well, what I thought was interesting—[…] is there's this dynamic with which people are familiar from the history of Silicon Valley, where you have people involved with the semiconductor industry turning to venture capital. Maybe most famously Eugene Kleiner.

FIALKOV: Yes. I knew Kleiner well.

BROCK: And others—Don [Donald T.] Valentine—all these figures who [made the transition] from [the] semiconductor industry executives to venture [investors].

FIALKOV: [Kleiner was a] Polytechnic [now Polytechnic Institute of New York University] alumnus as well, and PolyTechnic honored both of us one year [in 1999 with Outstanding Mechanical Engineering Alumni of the Century Awards].

BROCK: That's right. I had forgotten that about Eugene Kleiner. So, the Silicon Valley story is about the semiconductor industry executives who start venture funds, who fund other semiconductor companies in the valley, and you have a sort of virtuous cycle […].

FIALKOV: That's what happened […]. My oldest grandson started a company, Half.com. I don't know if you ever heard of it.

BROCK: I have, I think […].

FIALKOV: Which he sold to eBay for three hundred-seventy million dollars. Now, he's in venture capital, also early stage. His company's called First Round Capital. His brother, who also interned at PolyVentures, is now a vice president of Edison Venture [Fund]. [It's] a fund in New Jersey bordering Pennsylvania.

BROCK: Yes.

FIALKOV: Both grandsons wound up in [the Philadelphia area], or one in Gladwyne, [Pennsylvania]. The other one […in Villanova, Pennsylvania].

BROCK: Do you think that there [were], in your experience, […] other people who came out of the electronics industry in either the Long Island or on the east coast area that also followed this similar pattern? Because it seems your story very much parallels, and yet precedes in time, that Silicon Valley sequence.

FIALKOV: Yes.

BROCK: You start up big semiconductor operations on the east coast, you are very early into venture investment on the east coast, and you make technology investments [in], for example, Standard Microsystems, Long Island. So it seems […] there's a similar dynamic.

FIALKOV: Nothing, nothing like Silicon Valley.

BROCK: Because fewer people were doing what you were doing?

FIALKOV: Different culture.

BROCK: Could you elaborate on what you mean?

FIALKOV: I don't know what…I'm trying to think. There's only one big electronic company on Long Island. That's Computer something. Let's see. Computer Associates, [Inc.].

BROCK: Oh, services something. […] They're in services or something. Yes.

FIALKOV: But other than that none of the other companies have really sprouted wings.

BROCK: And you think that has to do with culture?

FIALKOV: Yes. Many of the people who live in Long Island […] wind up someplace else after college.

BROCK: Right. Let me just look at my question list here for a moment. Well, let's see. Maybe what we can do is just pause for a moment. […] I'm going to check the batteries on these recorders. That's what I need to do.

[END OF AUDIO, FILE 1.1]

BROCK: […] Well, maybe we could go through the story of Standard Microsystems then. […] We talked about how parts of it were related to operations that had come out of General Instruments.

FIALKOV: Somebody wrote a history. Let me find that.

BROCK: Oh, okay.

FIALKOV: It wasn't completely accurate, but I'll cross out the inaccurate parts. But there is a fellow who wrote the history […], an early history, of Standard Microsystems.

ULRYCH: That's interesting too.

BROCK: He wrote a history for the company? Corporate history, if you will?

FIALKOV: It was the kind of thing you're looking for […]. And the memory of what's written is better than my own.

BROCK: Well, maybe we could come up with some questions after I review that. […] Perhaps then we should just close our session today with talking about what I guess were your next steps in […] venture investing or in private investing (I don't have the terminology exact). After PolyVentures, there was another partnership, Newlight [Associates], is that right […]?

FIALKOV: Newlight Associates. That was the first Newlight, and then a second Newlight, two Newlight funds.

BROCK: Okay. Could you tell us a little bit about those funds?

FIALKOV: It's all technology. We only invest in technology companies. My partners were technologists, as I was. They went into fields that they knew something about.

ULRYCH: Did their background differ from yours […]?

FIALKOV: No, there was some semiconductor funds. […] That information I have and I'll put that all together. [And you can go on] their website and get a lot of information.

BROCK: […] That's true.

FIALKOV: It's nlventures.com.

BROCK: Okay. […] You mentioned that you retired four years ago. […Was] that retiring from the second of the Newlight funds?

FIALKOV: I'm only a member of one board. I retired from eleven.

BROCK: From eleven boards?

FIALKOV: […] Eight ventures and three non-profits. I've been on this board for about twelve years. They haven't made any money yet, but I think they're at a turning point. They use plasma to turn hazardous waste or municipal waste into energy.

BROCK: Oh. It's very high temperature combustion. The plasma…

FIALKOV: Yes. The name of the company is InEnTec, and it's www.inentec.com. You can get a lot of information on that. They've recently made a deal with Waste Management, which is the largest garbage company, to convert garbage into various kinds of energy. There's a whole multiple of things they can convert too, including ethanol if they want to, or any other energy-forming gas, [like] hydrogen. Finally, [in the last] year, […] they made an arrangement with Lakeside Ventures to take care of hazardous chemicals and the hazardous waste in the chemical industry. With Waste Management they have an agreement for muni garbage. And

that's beginning. There's major money in those efforts, and if I live long enough they'll go public.

BROCK: What were the three non-profits boards on which you were serving?

FIALKOV: I was on the board of the North Shore University Hospital Research Operation, which I left. A Canadian trust that my uncle had set up called Heinish Foundation, which was his name. One other…PolyTechnic.

BROCK: Yes. […] When did New York University merge? […After you had left the board of Poly]?

FIALKOV: Yes.

BROCK: […] Beyond serving on those three not-for-profit boards, […] have you been involved with other philanthropic efforts, or hobbies [other than tennis]?

FIALKOV: Probably a dozen. […] When I had a larger home in New York, I had a whole wall full of plaques that my daughter is hiding someplace now. I kept a few, but I wouldn't call me really a philanthropic person. But I was honored by the Crohn's and Colitis Foundation. I was honored by [World] ORT. You know ORT?

BROCK: No I don't.

FIALKOV: That's a Jewish rehabilitation and training operation. Honored by Technion [Israel Institute of Technology…], where I'm still a life member or something or other, a regent. I'm no longer a trustee. I'm a regent. But I don't have time for too many. I'm happy that I'm on one board. It keeps me busy. But I miss work.

BROCK: It sounds like you were an extremely busy person for an extremely long time. Well, maybe […] this is a good place to stop the recording.

FIALKOV: Yes.

[END OF AUDIO, FILE 1.2]

[END OF INTERVIEW]

INTERVIEWEE: **Herman Fialkov**

INTERVIEWER: **David C. Brock and Richard Ulrych**

LOCATION: **The Chemical Heritage Foundation**
Philadelphia, Pennsylvania

DATE: **23 November 2009**

BROCK: […] I was wondering if you could just describe that company and its operations at that time.

FIALKOV: At the time, I joined Radio Receptor there were two divisions. Radio Receptor was formed by two gentlemen, Hugo Cohn and Ludwig Arnson, in 1922. So, it was a company that had been in business for quite some time when I joined them. They had a semiconductor operation, selenium rectifiers, and they had an electronic operation which was primarily military electronics.

I joined them as the principal mechanical engineer in the division that manufactured military electronics. […] My work experience to date had been with a company, Emerson Radio, and then Teletone Radio that was in electronic equipment. I was hired by the then general manager, who was a classmate of mine at NYU evening school from which we graduated in 1951. [We were both near]—each of was near—the top of the class, and we got to know each other. He offered me a job, and I took it, and left commercial electronics to go into military electronics.

BROCK: He was the general manager of the military electronics?

FIALKOV: General manager of the company.

BROCK: Of the whole thing? Okay.

FIALKOV: Of the whole company. His name was Isidor Seidler, generally known as "Buck" Seidler. Nobody called him Isidor. Very smart guy. So, shortly after I joined, the two owners of the company hired two gentlemen, I believe from Bell Labs—I remember the name of one of them (his name was Rudy Sachs); I don't remember the name of the other one—because they felt that their Rectifier Division would be impacted by the new semiconductors.

So they immediately embarked on a germanium diode program and played around, under license from Bell Labs and RCA, with making transistors—first starting with point conduct transistors, which were very difficult to manage, and ultimately getting into PNP transistors. It didn't take long for the two new gentlemen to be attracted to other companies who wanted to get into the semiconductor business and left them.

BROCK: The two people who had come from Bell?

FIALKOV: The two people who had come from Bell. One went to a company near Philadelphia called National Union [Radio Corporation]. Another one went to CVS Electronics. Both of whom never made it into semiconductors.

BROCK: Right.

FIALKOV: And we continued to learn more about PNP transistors, but there was very little to learn from. The only text at that time was a book printed by Bell, and it was licensed information from RCA. So, they embarked on a program to make transistors for essentially the hearing aid business, which was the first utilizer of these kinds of transistors.

BROCK: These were germanium alloy?

FIALKOV: Germanium PNP alloy transistors.

BROCK: […] The selenium rectifiers—to what sorts of uses were they put? Was that for radio, or…?

FIALKOV: I imagine it was used in radio. I don't know where else. I was not really involved in the marketing of the selenium rectifiers. So, I knew very little about their function. It wasn't until silicon rectifiers came around that it impacted selenium. […] So their judgment was […] to get further into the semiconductor business.

Now, the two gentlemen, one of [them] was seventy-five […], that was Hugo Cohn, and the other one, Ludwig Arnson, was probably close to eighty, were advised by their attorneys […to] get their estates in liquid form. So, they began searching to sell the company in order to take it public, which was the hope of the engineers who worked there, because we had stock options. So, they had these people marching through the company looking to estimate its value or whatever. It became apparent to us that our future was kind of shaky because we didn't know

what was [going to happen]. And I [was] determined to see if I could find another avenue in the semiconductor business. I actually went out to California, where one company tried to recruit me. But the ultimate…

BROCK: Who was that?

FIALKOV: I'm trying to remember the name. I don't know if I have it in my records anywhere. But, I was very reluctant about California […]. I asked them if they would relocate me back in a year if my family wasn't happy, and they didn't have a program for that […]. So I didn't take the job, although it was an interesting opportunity.

BROCK: Was that in southern California […]?

FIALKOV: It was in Silicon Valley […]. A major electronics company, but my memory fails me. It was a very interesting trip, however. It was my first visit to the area and they treated me very well. But, in those years, it was like a twelve-hour length trip with a stop at Albuquerque, [New Mexico], for refueling.

BROCK: There was a manufacturer of selenium rectifiers […] right there in Palo [Alto, California]. Is it like Federal Telegraph or something?

FIALKOV: That wasn't the company.

BROCK: No […].

FIALKOV: If I find it [someplace], I'll let you know. At any rate, when I came back, we learned from Bell Laboratories that it was better science to make alloy transistors using a single crystal rather than a polycrystalline material, and they gave us seeds to grow single crystal material. In order to grow single crystal material along the appropriate axis, you had to have certain equipment which we did not have. One of my engineers told me that there was a quartz crystal manufacturer in Jamaica, which was not far from us in Queens County, manufacturing quartz crystals. He had the equipment. I called him up. His name was Eugene Kral. Called him up and arranged to come down and align my seeds along the proper axis, which he was able to help me do. However, he told me that he would like to get into the transistor business. This was at the end of the Korean War where the major market for the quartz crystals, which he manufactured, was for military equipment. He saw the end of his business and he felt that he needed to do something else. He asked me whether I could help him get into the transistor

business. I told him, "Why, I certainly could." We had recently licensed a British company from Radio Receptor called Pye [Radio Works, Ltd.], a major British company. So, I had been through all the business of transforming technology to them. He asked me, "Well, how many people would it need?" I said, "Just me." He was amazed, because apparently five people who worked for Radio Receptor had put together a business plan and given it to him for getting into the transistor business.

Well, he was astonished that he didn't have to hire five people, and made a deal. It was the kind of a deal where he would put a certain amount of money in and I would put in a note for five thousand dollars and I would own 30 percent of the company and he would own 70 percent. So, in August of 1954, I left Radio Receptor. He [turned] the garage of his plant into a home for General Transistor. He had employees. He had several employees who were very helpful in doing what we had to do in building crystal pullers, and following all the routine for making germanium transistors. So, with just a handful of employees we started General Transistor.

BROCK: Now, did some of your colleagues from Radio Receptor semiconductor operation come with you? Or, did you hire some people?

FIALKOV: No, not at the beginning, but later on.

BROCK: Okay.

FIALKOV: I'll get to that. So, we started. […] I was in charge of production and engineering and marketing to the hearing aid business, which was essentially in Minneapolis-St. Paul [Minnesota], in those years. We started sampling all the computer companies. He started his attempts to sell it to the military, which he found [after] short order was not very successful. So, the expenses continued. Of course, they were very modest expenses. I think his total investment was about seventy thousand dollars before he told me he'd like to sell the company.

So, I began efforts to sell the company, and at the same time to look for another job, because I wasn't being paid. He stopped paying my salary. The interesting part, I went to RCA [Corporation] in Camden, New Jersey, and they were interested in hiring me. They had two positions for which I was qualified. One was paid a certain amount, and the other one paid a certain amount more. I said, "I'll take that one." They told me they can't really give me that one because they had a system for salaries for a certain number of years after graduation. Since I'd graduated from night school instead of my early college years, I didn't fall into the higher salary class, [so I turned them down].

But then came along an offer, also from my friend, Buck Seidler, who had some connections with a company—a public company called Jerry O'Mahony Incorporated. Now,

Jerry O'Mahony Incorporated was a public company listed on the American Stock Exchange in two businesses. One business made dining cars, the old-fashioned cars: diners. The other business made truck bodies, which were also not very interesting businesses to the public community, and they wanted to get into something more exciting.

They acquired General Transistor from us, where I had a promise of a certain percentage in the future. I don't remember […] the exact terms, but they paid off Eugene Kral in stock, [the equivalent of his] investment. And of course, the stock ran up based on this hype. He came out very happy. I had to run to them for payroll on a weekly basis because we weren't making money. They didn't understand the business. […] The president of this company was not the guy who made the decision to buy us. It was the promoters who were involved in promoting the company.

So, after a number of months […] business hadn't turned around. Radio companies were now interested in [manufacturing transistor] radios, but none of the major people who we had sampled was really ready. Keep in mind that transistors at that time were not very reliable. We didn't know…we knew how to make them, but we didn't know how reliable they were. The science was very early. None of the companies that we sampled really turned out to be purchasers.

So, the president of Jerry O'Mahony decided he'd had enough and he said he wanted to sell the company. A couple of companies were interested. One of them was American Machine and Foundry […] to whom we were selling transistors for some secret project. They were so anxious to get these transistors for which they were paying about seven dollars each at that time, that they asked us to go on extra shifts, and ship them transistors daily. Daily. I was running to La Guardia Airport every day with transistors to ship to American Machine and Foundry.

Well, they were interested in buying the company. General Instrument was interested in buying the company. I had connections with them back from the time that I was in the commercial TV and radio field. Bulova Watch was interested in buying the company. We were poor kids. Oh, I did hire one fellow from Radio Receptor, [his name was] Bernard Cohen. The way I hired him was I sold a license to a Dutch company. Well, it gave me enough money to give him his severance pay when I hired him, because it was very shaky at the time. So, we didn't ask too much. I think the first time we asked a price of a hundred twenty-five… actually I had skipped the part where I and three other of the employees purchased the company from Jerry O'Mahony. We were able to purchase the company by each of the four of us putting up twenty-five hundred dollars for a total of ten thousand and getting another twenty thousand dollars from a lawyer named Arnold Malkin. He got fifty percent of the company, and we each got twelve and a quarter percent, actually probably twelve percent, because we owed money to the lawyer who had helped us form the corporation. We gave him two percent instead of his four hundred dollar fee—he made out very well. Let's go further. Finally […], I'm trying to remember who the first one…we told them we wanted a hundred twenty-five thousand dollars. Remember we had only put in ten plus twenty, was thirty, so it looked like a good profit, good short-term profit. We were all poor kids. That didn't work out, but then we started getting these

American Machine and Foundry orders. And at the same time, Radio Receptor went out of the transistor business.

BROCK: This was in about 1955?

FIALKOV: […Yes]. They went out of the transistor business. We bought their inventory, tested it, and those that passed we sold for seven dollars a piece. So, that was a pretty good deal. Things were looking pretty up […]. But then General Instrument came and I met with the executive vice president, and the president, and they asked us what we wanted. We said two hundred fifty thousand dollars.

ULRYCH: Got greedy.

FIALKOV: They said, "Are you serious, or is that very negotiable?" I said, "No. We're very serious." They ultimately paid thirty million. [laughter] But that didn't pan out because they weren't willing to pay two hundred fifty thousand. The next company was Bulova Watch—no, probably American Machine and Foundry. The price we told them was three hundred seventy-five thousand dollars, and they were thinking about it when Bulova Watch became very serious about investing and paying five hundred thousand dollars.

BROCK: And they were thinking of creating what? Transistorized watches?

FIALKOV: A semiconductor division. I don't know whether they were thinking about transistorized watches at that time. It was kind of early for that. By that time, we were selling them to radio manufacturers and to hearing aid manufacturers. But also, we began selling them to Remington Rand UNIVAC. I think they were in Minneapolis or St. Paul, one or the other. I was running there almost on a monthly basis. Remington Rand UNIVAC really was the first computer company to use transistors in something called the "File" computer. They bought PNP transistors from us, and they bought NPN transistors from Raytheon […].

BROCK: Was that a computer for the government, the File computer?

FIALKOV: I don't know whether it was for the government, but it filled up a very large room. It was a computer that filled up a huge room. It was a hybrid computer using vacuum tubes and transistors, which of course was not great because when you use so many vacuum tubes in a system and the filaments burn out…the reliability's very poor. But they had a fellow there named Seymour [R.] Cray. Is that a familiar name?

BROCK: Yes. [laughter]

FIALKOV: He was some sort of a genius in making fast computers. I was running there on a monthly basis because, for the first several years of General Transistor, [UNIVAC was] more than fifty percent of our business. Subsequently, when Seymour Cray left, and the head of their division left to start Control Data, we designed a special transistor for them that was faster. I think we called it a "drift transistor."

At any rate, we were negotiating with Bulova, who was very serious. Arty Bulova himself came and they were doing all the arithmetic…found an underwriter who was willing to take us public. Actually, there were four underwriters and they raised three hundred thousand dollars for us by selling one-third of the company and issuing a hundred thousand shares at three dollars a piece. The head of the syndicate was a fellow named Brauner, and a major fellow in the [company was] called Stanley Heller. Then there were two others. I don't know whether I sent you information on that public offering […].

BROCK: I think it's in there. So, that public offering was in 1956 maybe, or was that 1950?

FIALKOV: It was 1956 […]. We were already selling transistors to the company industry. So, the public offering went very fast. But it took four underwriters to sell three hundred thousand dollars worth of stock. The expenses for […] going public today are significantly more than three hundred thousand dollars, but dollars were different in those days. So, we became a very interesting company. We were listed on the American Stock Exchange. The stock ultimately went up to ninety before we split it. In 1960 […], we merged with General Instrument.

By that time, we were selling transistors to UNIVAC and to Control Data. So, we were at the forefront of computer business. They were the frontrunners for using transistors in computers. We also took a license from Philco, who had designed a very fast switching transistor, probably the fastest at that time, and we felt we had to have the license. We started making transistors under the Philco license. If you recall, Philco openly sold out to Ford [Motor Company].

BROCK: Right.

FIALKOV: And also, an important fellow left Philco, Bob Noyce, and went out to the West Coast with the Shockley [Semiconductor] people, and then later started Fairchild [Semiconductor]. I'm a little disconnected now. It ended in 1960 with the merger.

BROCK: Right. If I take you back into your years at Radio Receptor, at some point you moved from the military electronics side over to the semiconductor side.

FIALKOV: Yes. Two people, as I told you, left. One went to National Union. One went to CVS.

BROCK: Oh, yeah.

FIALKOV: And the owners decided the best thing to do was transfer their own senior employees to the semiconductor division. They transferred a fellow named David [J.] DeWitt to head the semiconductor operation. He later went to IBM and became a fellow of IBM. Bill [William] Harding was transferred [to the operation from the selenium rectifier operation]. I was transferred from the military operation and became, essentially, in charge of production—engineering production and mechanical engineering, the design of equipment for making transistors. A fellow named Roland Wittenberg moved from their electronic operation. So they sent their own employees as a team, headed under David DeWitt.

BROCK: Were you happy about that? Were you happy about that transfer […]?

FIALKOV: Well, I have to give you a piece of advice I got from a mechanical engineer with whom I worked in the television business. See if I remember his name. […] At any rate, he was an elderly gentleman. The radio business was very simple and you didn't have to be an electronic engineer to be the chief engineer. […] When we went to television, he was bypassed for that role [by] an electrical engineer. He gave me a piece of advice. He said, "Herman, if you ever get an opportunity, […] go into a business where the mechanical engineer could be the boss."

Since at that time in the semiconductor industry it didn't matter what kind of an engineer you were, whether you were a chemical engineer—we had one of those, Paul Petran was his name, who came to the semiconductor operation from Radio Receptor—or an electrical engineer, which David DeWitt was, or a mechanical [engineer, though] my degree was [in] administrative engineering, […] my experience was mostly mechanical. […] All you had to go by was the information you got from Bell Labs and RCA. […] I think I told you, I went to my college chemistry textbook, *Smith's College Chemistry,* and it said, "We won't cover

germanium, because it has no commercial use."[5] [You] couldn't get any information from the chemical texts. So we went forward.

BROCK: […] In addition to the "Ma Bell's cookbook" I guess it was called, the materials from Bell and Western Electric [Company and] RCA, […] when this team moved over into the semiconductor division did you also go to RCA, go to Bell Labs, go to Western Electric?

FIALKOV: Of course.

BROCK: What were those experiences like […]?

FIALKOV: They were very helpful […]. They were licensors looking to help us. Now, what I didn't tell you was that we ran into a problem in the early days of selling transistors to UNIVAC for the File computer. When on one of my trips, they were all downcast and very unhappy and told me they had a major problem. They couldn't get the NPN transistors from Raytheon.

So I said, "Give me an order for a hundred thousand dollars, and I'll make them for you." Because we had the information from RCA, and we decided one way to make PNP alloys and another way to make NPN alloys, it's the same business. So, they asked me, "Well, how long will it take you?" I said, "Oh, give us a month." They laughed because Raytheon told them it would take about four months. We delivered in a month. So, the File computer kept going. By that time, I had two good engineers, a fellow named Bernard Cohen, and another fellow named Bernard Jacobs. Bernard Jacobs actually designed the drift transistor for Seymour Cray.

BROCK: Did they stay with you into the General Instrument period, or…?

FIALKOV: Yes. Yes.

BROCK: When you got into production engineering at Radio Receptor for, I guess, the diodes and the transistors that they were working on […], I just was wondering if you could talk about what germanium semiconductor device manufacturing was like in those times. […] What was your production line like, and what were […] the most important steps?

[5] Alexander Smith, James Kendall, and William Frederick Ehret, *Smith's College Chemistry*, 6th ed. (New York: D. Appleton-Century Co., Inc., 1946).

FIALKOV: I'm sorry I couldn't find the movie about it [that I told you about last time we met]. I looked and looked and looked, and couldn't find it.

It took a lot of labor. You had to put the pellets into a block that was designed to go into the oven and make transistors when it was attached to the polycrystalline or the crystal. Because […] you had to actually diffuse the impurities into the base. It was mostly ovens that did all the work. My recollection is that we used hydrogen in the ovens. That's essentially what it was.

As a matter of fact, one engineer that worked for us—we started a division at General Transistor to make the germanium silicon crystals […] in ovens—brought his father, who had been a baker and showed him the shop. He said, "It's like having a bakery. What's so exciting about it?" That was a division called Semi-Metals, which was a very profitable business under the fellow who ran it, Mort [Morton] Brozinsky, whose father was a baker […].

BROCK: So, it sounds as if there was a lot of handwork of people loading the alloyed pellets into sort of a jig and then attaching the leads, and…

FIALKOV: Yes, tweezers…putting the pellets…yes.

BROCK: Then what would you do? Would you saw them?

FIALKOV: We used a carbon boat that had been designed to accentuate where you could put in all the elements and have it go through an oven. It was a long horizontal oven.

BROCK: And they were already individual units at that point […]?

FIALKOV: Yes. It diffused during the heating and made transistors.

BROCK: When you went to General Transistor, obviously being able to pull single crystals of germanium was a key thing.

FIALKOV: Yes. Well, we adapted. We took a drill press, and we used coils […] to provide the heat while we pulled the crystal out of a molten mass of silicon. The important thing was the alignment of the seed in order to get a perfect crystal instead of molten polycrystal. So we

adapted —we made—a crystal puller out of an ordinary drill press and used coils, sort of transformer coils, to heat it up to a certain degree.

BROCK: Were you also trying to […] automate the production of the transistors [at General Transistor]?

FIALKOV: The only automatic equipment we used was the one to make the Philco type transistors. […] That was all automated. They gave us the specs. We probably bought certain equipment from them that helped us make them. They had designed the equipment to make them automatically. That was a fast transistor. The computer industry liked it at that time. Of course, it was [made obsolete] by the planar silicon transistors. So that went along for a while and was profitable.

BROCK: But for all your other alloyed transistors, [there] was a lot of labor […]?

FIALKOV: Yes, a lot of labor. We used a lot of automatic equipment to make germanium diodes. We automated that first. That was practically all automated.

BROCK: Because that required fewer processing steps?

FIALKOV: Right.

BROCK: Just one [alloyed]. Where were you getting your labor force for doing all the handwork, in the transistor production especially?

FIALKOV: It was no problem hiring labor. No problem.

ULRYCH: Were there any qualifications at all […] needed, or just the readiness to come to work and have good work habits?

FIALKOV: No […]. It was mostly young women who did all of that.

BROCK: To go back to the very earliest history of General Transistor and some of the documents that you sent to me, I saw that Eugene Kral had set up—had actually incorporated—an entity that he initially called Ivanhoe Electronics.

FIALKOV: That's [correct]. And changed the name to General Transistor.

BROCK: Okay.

FIALKOV: He had already incorporated Ivanhoe.

BROCK: […] Then essentially it was you and this other group of employees and Arnold Malkin who then sort of bought out Kral and his original partners. Is that [right]?

FIALKOV: We bought out Jerry O'Mahony.

BROCK: Okay, [and O'Mahony had bought out Kral]?

FIALKOV: […Yes].

BROCK: Okay. […] Did any of those original people, like Eugene Kral, have any ongoing involvement after the O'Mahony thing?

FIALKOV: No.

BROCK: They were out of it.

FIALKOV: His employees who helped us were important helpers.

BROCK: There was one person's name [that] I saw: […] Frank Panucci?

FIALKOV: Frank Panucci was our accounting officer. He was our chief financial officer. I guess we hired him from Radio Receptor. The four partners who put in twenty-five hundred

dollars each were Frank Panucci, Bernard Cohen, Max Fialkov, who was my brother, who ran production for the company, and [me].

BROCK: And so he was the production supervisor, if you will?

FIALKOV: Yes.

BROCK: Like the foreman for the line, if you will. I mean, […] I'm just wondering…

FIALKOV: I don't know what you call them. But, he was in charge of manufacturing.

BROCK: […] How long did he stay with the firm?

FIALKOV: Until we sold it to General Instrument, when he left, and essentially thought he was retiring. But he went on to purchase a restaurant in Manhattan, and kept his family going for quite a while.

ULRYCH: Interesting, […] what a change […].

FIALKOV: He had a restaurant right across the street from the Empire State Building, and it was a popular fish restaurant. […] The business was mostly lunches, very little dinner, and survived for a long time until he sold it. He had two sons working for it, and they all made a living.

BROCK: So, let me…I'm sorry, I'm just reviewing my notes here. Now, the initial focus at General Transistor was on the hearing aid market and also transistors for computers.

FIALKOV: Right.

BROCK: […] Where did that focus come from? Was that something that you had seen at Radio Receptor? Or was that just general…?

FIALKOV: It came from our […] sales representative in Minneapolis-St. Paul, who was used to selling to the hearing aid people. But then he introduced us to Remington Rand UNIVAC. We found a way to make all the engineers happy. We subscribed to something that a company called Bigelow did, where it sent each engineer a very small gift every month. It might be a shoehorn or a fly swatter or something like that—a very small thing. The fly swatters were a very big help to them [at that point]. [laughter] And their wives loved it. So they loved us. It was a business that worked. They heard from us every month…

ULRYCH: With a gift.

FIALKOV: With a very minor gift that didn't cost much. The engineers loved us, and General Transistor…we hired one of their top engineers ultimately and he headed our engineering marking operation.

BROCK: […]You hired somebody from UNIVAC?

FIALKOV: Yes.

BROCK: Oh, interesting.

FIALKOV: Yes.

BROCK: Was [he] your sales representative at that time […or] an employee of the company? Or an independent…?

FIALKOV: No. He was a commissioned sales representative and he was terrific. He had Minneapolis-St. Paul covered very, very well. And of course, helped us with Control Data as well as UNIVAC, which was, as I said, fifty percent of our business […] during the first four years of our growth.

BROCK: And then Cray was in Wisconsin.

FIALKOV: Yes.

BROCK: It's interesting to think about those upper Midwest states as the center for transistorized computing in the 1950s.

FIALKOV: Yes.

BROCK: So, was there a great deal of difference, do you recall, between the alloy transistors that you were making for the hearing aid uses and those that you were making for computers?

FIALKOV: Very similar. And radios as well. The electronics was different, […] and I was a mechanical engineer. I had taken a year of course in the fundamentals of radio, but it was all vacuum tubes. So I had to teach electrical engineers how to switch from vacuum tubes to transistors. I did the best I could.

BROCK: Taking that Philco license for their fast transistors, was that an idea that you had come up with […]?

FIALKOV: Our marketing people told us we needed them.

BROCK: Because that's what the computer customers were going for?

FIALKOV: Yes. My vice president for marketing told me that [it] could take over our business. And of course it did for a while.

BROCK: So, it seemed that […] there was a private placement of stock in 1956, and then there was this big public offering stock in 1958…

FIALKOV: Right.

BROCK: …with Hayden Stone.

FIALKOV: Right, Arthur Rock. A Hayden Stone fellow was on our board; his name was Wickliffe Schreve. And also […] on our board, a fellow who helped us do the private placement, Carl Narblack. He was originally with Lehman [Brothers]. Lehman didn't want to

do the deal. So, he took a job with Kidder Peabody [& Company], and they did the private placement.

BROCK: […] For a new company in this booming new technology area, how important were your connections to Wall Street financiers and things of that nature?

FIALKOV: Very important. […] Our banker was JP Morgan on Wall Street. That gave us a little pizzazz. Carl Narblack became very interested in the company. Then Arthur Rock became very interested in the company, and we became good friends. I invested in his first venture capital operation, Davis and Rock.

BROCK: So, Arthur Rock had become interested in the firm because…I mean, it seems that your sales volume was just skyrocketing over this second half of the 1950s.

FIALKOV: Yes. It was going up. As I said the stock […] reached a high of ninety dollars a share, that three-dollar stock. It subsided from that. I think it was about sixty dollars a share, and [we] split it, and it was about thirty dollars a share when we merged with General Instrument. But it was still a substantial amount of money.

BROCK: It seems like in this period of time […] on the American Stock Exchange [that] there were a number of these sorts of high tech issues that were really experiencing this […] same sort of phenomenal stock growth at this time.

FIALKOV: […] That came. The beginning of the stock hot era.

BROCK: Do you think this was sort of the beginnings of that?

FIALKOV: Yes. There were people in Wall Street [who] just focused on high technology, rather than price to earnings. […] They saw a big future in it.

BROCK: It seems that the American Stock Exchange was a home for a lot of these companies, high tech companies.

FIALKOV: It was very easy to get listed, and it gave you an imprimatur that you were a real company. Of course, you could buy and sell. But later on, over-the-counter, NASDAQ became just as important for the later companies.

BROCK: In this period too, let's say up to 1958, you were, […] compared to many other of your counterparts, a relatively young man […]. Did that play to your advantage or to your disadvantage sometimes? Or do you think that that…?

FIALKOV: I don't think it mattered.

BROCK: Didn't matter. Were there […] mostly younger people in the company, General Transistor, at this time? In the same way that if you think of some of the Silicon Valley startups that are happening around this time, everybody's in their late twenties or early thirties. Was it similar for you?

FIALKOV: It was similar. I mean, I became president of General Transistor, I was thirty-two years old, I think. Today, some of them are much younger.

BROCK: That's true.

FIALKOV: My grandsons were entrepreneurs at a younger age.

BROCK: I noticed also that […] General Transistor had, [by 1958], set up two subsidiary companies. One was the General Transistor Distribution Corporation, and the [other was] General Transistor International Corporation. I was wondering why you did that.

FIALKOV: Hard to remember. But, I don't know whether our marketing people felt that we ought to do it. […] We had to have sales representation in Europe, so we had an international operation. I think that continued on when we merged with General Instrument. We had a fellow running International, and selling to distributors is very different than selling to manufacturers. We thought that it required people who knew the distribution field. That was really [a marketing decision]. I don't know whether any accounting decisions had anything to do with it, but I don't believe so. It was just a way of setting up departments.

BROCK: Okay. Then it seemed also that by 1958, while making transistors for computers was the dominant activity, there was a broadening of activity related to either semiconductors or computers. […] We had talked a little bit about the […] Semi-Metals organization?

FIALKOV: Yes.

BROCK: [What] I thought was interesting [was] that you were supplying single crystal silicon and germanium. In [essence], wouldn't you have been supplying that material to your competitors?

FIALKOV: Yes.

BROCK: So, I was just wondering about that, if that gave anybody pause […]?

FIALKOV: No, because they could buy it from a number of sources. We felt we knew how to do it. We had a small company […]. By [my] recollection it was profitable almost every year and growing, and continued after the merger with General Instrument […].

BROCK: I guess […] Texas Instruments was doing a similar thing at this time, were they not? Do you recall?

FIALKOV: I don't recall. It was a small effort on our part compared to our total business. […] Obviously, we had to get into microelectronics, which we did. That turned out, but General Instrument divested—it became Microchip Technology [Incorporated] which is a [highly] successful company.

BROCK: Right. At General Transistor in the late 1950s, you moved into magnetic heads […].

FIALKOV: It just seemed like another opportunity. We had people that knew the business in California, and we set up a subsidiary out there to make magnetic components. After the merger with General Instrument it didn't report to me anymore. It reported to […] the fellow that headed military equipment. I lost contact with where it was going and what happened.

BROCK: Okay. But the relationship there was still one of relating to computers, right, for magnetic tapes?

FIALKOV: Yes. The important thing was the switch from the old type of magnetic to the semiconductor types of memory. […] I'm trying to remember the name of that company in California. It was the name of two people. It wasn't Hewlett-Packard, but something like [that].

BROCK: […] Isn't it something like Eitel-McCullough? There was a big electronics firm that was two people's names […].

FIALKOV: I'll remember one of these days, probably in the middle of the night.

BROCK: Let's see. Well, then I had some other questions about the work going on with Bernard Jacobs in the research operations at General Transistor. I was fascinated to see that he was another physical chemist, leading the operation. I was also interested to see that the research operation had some contracts from the government to work on silicon devices in this period.

FIALKOV: Yes.

BROCK: There was one that I thought was very interesting called dynister, which was some sort of mesa diode, or some sort of […] an experimental diode that had a structure that […] looked to me very much like a mesa transistor. Do you recall anything about that effort?

FIALKOV: Was that at General Transistor or General Instrument?

BROCK: That was at General Transistor, I think right before the merger.

FIALKOV: [That's] something that I have very little recollection of. We probably had some people working on it, because we were interested in silicon's effect on the selenium. So it probably dated from that. I think that was at Radio Receptor. My recollection is that was at Radio Receptor, not General Transistor.

BROCK: Well, there was some information about silicon work of this type continuing at General Transistor.

FIALKOV: Perhaps it did.

BROCK: Also maybe it carried over.

FIALKOV: But at General Transistor, my recollection is we were really not interested in government work.

BROCK: Okay. Maybe it was a small activity.

FIALKOV: At Radio Receptor they did. I don't remember it at General Transistor. We didn't have any kind of marketing to the government. And it never got any help from the government, nor did we want any.

BROCK: Because you were focused on companies […] supplying computers.

FIALKOV: Yes, we were focused on the computer industry. That was our future.

BROCK: […] One of the great lines I saw in some of the press coverage of General Transistor stock from 1958, when it shot up from like seventeen to fifty-one, was to describe it as a "Buck Rogers" stock. I guess that's kind of what we were talking about before […].

FIALKOV: Yes.

BROCK: Specifically, [of Wall Street becoming interested] in high tech companies. The other Buck Rogers stocks that it listed in this article were Texas Instruments, Raytheon, Fairchild, Cameron Instruments, [Inc.], and General Transistor. Were you looking at these other companies as sort of your peers? Or how were you looking at what was happening outside of General Transistor?

FIALKOV: Well, we were concentrating on the computer market. Texas Instruments was concentrating on much broader markets. Raytheon, I think ultimately faded away sometime. RCA faded away. General Electric faded away, except for maybe [some] silicon [controlled] rectifiers [SCR]. The people whose major businesses were vacuum tubes didn't learn fast

enough to spend the effort on semiconductors because their bread and butter was coming from vacuum tubes. So, many vacuum tube manufacturers never made it in semiconductors.

BROCK: Another question that I had about the public offering of the stock in 1958—was that […] also a mechanism for Malkin to get out of the company at that time […]?

FIALKOV: That was important for him. He wanted to get out. He wanted to get out and he got out. He got out a little early, because I think the stock appreciated very substantially after he got out. I think he wound up with about two million dollars, where a couple of years later it might have been worth eight million, or something like that. [But] he got out. The next thing I heard from Malkin [was when Barry M.] Goldwater was running for President; he was helping Goldwater. He made a statement to me that if Goldwater doesn't get elected, he'll leave the country. [When] Goldwater didn't get elected, he moved to Texas. [laughter]

BROCK: […] After that public offering in 1958, how did that leave you in terms of your stake in the company? Did you have a controlling interest in the company at that point?

FIALKOV: Essentially, I was the president, and the board, as long as I was president, deferred to the decisions made by the president. They supported me. The reason Malkin left is he didn't want to support me. He wanted to be the boss, [and] he left because he couldn't get [the support of] the other directors. We originally set it up so that my team had two directors, and his team had two directors. Then we finally had a fifth director who was a banker. He thought […] all he had to do was to get the fifth director on his side and he would be in control. He couldn't do that because the banker didn't see how the board could run the company. So he decided to leave.

BROCK: Did he have a different view of where the company should be going, or was it a matter of ego?

FIALKOV: He had different opinions of the major principal officers about the company. He was critical, and he felt he wanted to be able to control. […] He went to the board meetings every week. He wanted the board to approve every major presidential decision, and it just was not a workable plan.

BROCK: So […], after the public offering—1959, beginning of 1960— the stock goes to the stratosphere…

FIALKOV: Yes, and then fell back.

BROCK: …but fell back to a high level.

FIALKOV: Yes. It's still a good [stock].

BROCK: How did the computer transistor business play out in those years? Was it still…?

FIALKOV: It was still going strong when we merged with General Instrument. It was after the merger that it became evident that we had to get into microcircuits, because that was the future, and for every industry really. So I went out and recruited a bunch of fellows from California and we got into the microcircuit business.

BROCK: Now, […] there are certainly other corporations and other organizations that didn't as aggressively move into integrated circuits, as the direction for microcircuitry at this time. So, I was just interested in the thinking process that led to such a focused clarity on that.

FIALKOV: Well, I became interested in microcircuits, at a very important time. I showed you that thing from *Barron's* magazine. It came with the pen stand.

BROCK: Right.

FIALKOV: […] The Electronics Industry Association [EIA] had a Semiconductor Division and then had subdivisions, and I was the first head of the Microelectronics Subdivision because I believed in it. I would meet frequently with Bob Noyce and talk about what we were doing. We would talk about when we had this new process for transistors called COPLAMOS, and he had the new idea for putting a computer in a chip. So, I knew that microelectronics was the future.

BROCK: […] Do you recall how you came to that conviction? Who you were talking to, things you were reading, things you were looking at?

FIALKOV: Well, being a member of this Electronic Industries Association and getting to talk to other people, every major semiconductor company was a member, including Texas

Instruments and [so on]. Those that got into it and succeeded [made history]. Those that didn't and just left the semiconductor field are history.

BROCK: Well, maybe to take a half step back, we could talk a little bit about the story of the merger with General Instrument that, I guess, happened around May 1960—just exactly how that came about, and what kind of a company General Instrument was at this time.

FIALKOV: General Instrument was essentially a radio and television components company. They did have a silicon rectifier operation in New Jersey, so they had semiconductor experience, but none in transistors and none in germanium diodes, which was still an important market. They saw a need for being a much broader part of the semiconductor business.

We wound up to be about […] one-third of their total volume. […] But that was including the rectifier division that I took over, and their components were about two-thirds. They also made other acquisitions later on which put them in other businesses. [They had] a military electronics operation and they ultimately bought the racetrack company that ran the betting at racetracks. They ultimately, when I was involved in making acquisitions, acquired Jerrold, which put them right in the forefront of the cable business. I think they ultimately became just a cable company, and sold out for something like seventeen billion dollars.

BROCK: I was looking at some of the information on General Instrument and your program in the first half of the 1960s to get into silicon integrated circuits.

FIALKOV: Right.

BROCK: I thought […] the sort of brand name that General Instrument developed for its microcircuitry, calling them nanocircuits, [was very interesting], and of course today nano is […] used for everything.

FIALKOV: Actually, at General Transistor we acquired a company called Nanocircuits…

BROCK: Really?

FIALKOV: …to get the fellow who was—it was really just an incorporation; it was really not a going business—to get the fellow [who had formed it] to head our marketing operation […]. So, nanocircuits was not a new word at that time.

BROCK: […] Did that person stay with you […]?

FIALKOV: He did for quite a while, yes.

BROCK: Do you recall his name?

FIALKOV: I should.

BROCK: Well, maybe I can find it somewhere.

FIALKOV: You may find it somewhere because he was an officer of the company.

BROCK: So, nanocircuits, [was one]. Fairchild called their stuff micrologic. Other people were talking about molecular electronics.

FIALKOV: It didn't matter. Fairchild was a very nice success story and, of course, the people who left it to form Intel, a very nice success story.

BROCK: You were hiring some people from Fairchild, is that right?

FIALKOV: From Fairchild, yes. […] All the people who started our microchip operation were people I hired from California.

BROCK: I was wondering…it seemed that you started your program on MOS integrated circuits, I believe…

FIALKOV: Yes.

BROCK: …in 1964. It's my understanding that, also at this time, RCA was very interested and active in MOS integrated circuits or MOS technology. Was there a connection […? Hadn't] you had this longstanding technical relationship?

FIALKOV: Not really […].

BROCK: No. Those were separate?

FIALKOV: We became interested in MOS. When we formed General Transistor. Paul Richman—head of research at that time, later became president, and made chairman—[…] had come up with this patent on MOS that was very important.[6] So, we were interested in MOS from that time on.

BROCK: Well, let's see. So, I know that after your eight years or so with General Instrument, that after really getting the microcircuitry effort going, getting the MOS technology activity going, that you then moved into…

FIALKOV: After the first seven years I moved into acquiring companies.

BROCK: Right. […] If you were in 1968 and you were looking at how General Instrument's efforts in integrated circuits and MOS were going, were you pleased? Were you satisfied?

FIALKOV: Well, we were not in the forefront at that time, but we had a good beginning that turned out to quite a successful operation.

BROCK: Let's see. Well, maybe we could talk, then, about why you chose to leave General Instrument in 1968.

FIALKOV: I chose to leave General Instrument because, by that time, I had a very small ownership in General Instrument. It was probably [in the] 1 percent range or whatever it was. I felt that I'd like to be where my money was. I decided having gone through as a limited partner of Davis and Rock, and his success, that I would enjoy being in the venture capital business. Because every time I wanted to make an acquisition, I had to sell the board of directors on it. […] I would like to be in a business where I could make decisions and not to have to sell another eight people.

[6] Paul Richman, "MOS field-effect transistor structure with mesa-like contact and gate areas and selectively deeper junctions," assigned to SMC Microsystems Corporation, Patent Number 4,023,195, filed 30 January 1976, issued 10 May 1977.

BROCK: Right. Well, it struck me that [at] just the time you were striking out into venture capital, at the period of 1968 to 1971, […it] seemed […] a particularly active time in terms of semiconductor startups.

FIALKOV: Oh, yes.

BROCK: […] MOS-based companies seeking funding. I was wondering if you would just talk about the atmosphere, and how that related to what you were doing.

FIALKOV: Actually, if I had invested only in semiconductors, it would have been a good decision because lots of successful companies came from early startups. But I had a partner and he had interest in other fields. We invested in fields [in which] we were both interested […].

BROCK: Were you concentrating on the semiconductor investments then?

FIALKOV: Yes.

BROCK: Were you investing mostly in MOS integrated circuit companies?

FIALKOV: It didn't matter to me whether it was MOS, but [obviously we invested] in the group that started Intel. I don't remember, [but] there were some we did not invest in, like Intel's major competitor. We had an opportunity to invest in them. We didn't.

BROCK: There was a company called American Microsystems that I think was founded in this era.

FIALKOV: It was founded earlier.

BROCK: It was?

FIALKOV: […] In this era, we had an investment in a company in Long Island that had sold its business and was now called Standard Resources. We merged it with a company [and] we became, essentially, an investment company after a while, because we had sold our business and became an investment company. We invested in AMI when it started. We also had invested in

a group from the NSA [National Security Agency] that we thought we would merge with Standard Microsystems and they did not want to. They sold out to AMI.

But, Standard Resources was an early investor in AMI. Standard Resources ultimately became Micro Semiconductor or Microsemi which is a NASDAQ listed company, selling semiconductors to major markets—the automotive market, especially the military market. I was chairman of the board for that company. My partner was on the board. I left it when it was important for me to resign from West Coast boards because I kept running there too often.

BROCK: It seems like that with several of these different firms that you were investing in through Standard Resources and through your investment partnership, that you really had your finger on the pulse of two important developments that were related to MOS integrated circuits in this period: [device manufacturing and circuit design]—people who were device manufacturers […and those] doing circuit design, [both] using computers [and] not using computers […].

FIALKOV: Yes, like Xynetics, [Inc.]. […] That was the technology industry of the future. Semiconductors just changed the world.

BROCK: It also seems that one of the major, major markets for, and consumers of, MOS integrated circuits, in this period of the second half of the 1960s [were] outfits like the National Security Agency and other operations dealing with electronic warfare and things of that nature. […] Did that give you any pause of investing in it? Did that create any complications because of government stuff?

FIALKOV: Well, we invested in a company, this group who left NSA. They were outstanding designers, the best designers that we could find at that time. But they were interested in designing error-proof computers for transmitting information. They decided that this was a company that had an idea to design an error-proof system. They did, and they did it on time, and they did it on budget, but that wasn't what the market wanted. If they had designed a computer first, just a general purpose computer first, they would have been ahead of everybody. [They] would have been ahead of Fairchild, because they designed a beautiful computer, but it was just for error detection. There was no market for that. They came from the government where that was very, very important [and] it was less important for anybody else. So their marketing focus was wrong. They ultimately sold AMI. I don't know what became of that particular operation.

BROCK: They were focused really on communications then?

FIALKOV: Yes. […] It was a fundamental difference between the needs of the government and the needs of the general community.

BROCK: Well, let's see. […] I have a whole sequence of questions that gets us into the whole Standard Microsystems that kind of begins with Standard Resources. I'm wondering if we maybe want to pause here and check in.

FIALKOV: Okay.

BROCK: Maybe stretch our legs or something. Let me just turn these off.

[END OF AUDIO, FILE 2.1]

BROCK: […] The next batch of questions that I had, really, here are about the story that leads up to the formation of Standard Microsystems, and then how the sort of Standard Microsystems story played out. So, you mentioned before that [by 1971] you had […] an investment company, Standard Resources Corporation, […and] that one of the companies you invested in was this Micro Design Corporation, which was a design group that had left NSA. Now from what I was looking at, it […seems] your intention was to take this design group and their company and merge it with an MOS manufacturer.

FIALKOV: Really a MOS research group.

BROCK: Okay, and take the two together.

FIALKOV: Yes.

BROCK: Why […]? Did you feel that just an MOS design house couldn't survive on its own or did you think that it would benefit from being more in touch with the manufacturing technology? […] What was your thinking there?

FIALKOV: Well, I felt that a successful manufacturing technology needed the design group to keep it at the advance of future products.

BROCK: Okay.

FIALKOV: It's very important for Standard Microsystems even today—they've acquired design groups throughout the country, at different locations in the country

BROCK: So, it was really more from the perspective of the needs of the manufacturers for design…

FIALKOV: Yes. To have customers for their products. They have to be ahead of the design group.

BROCK: Now […], I understand that one of the manufacturing companies that you were looking […] to possibly […] incorporate this design group was Solid State Data Sciences.

FIALKOV: Yes.

BROCK: […] And this was a company that you were familiar with because it had been a General Instrument spinoff, is that right?

FIALKOV: The head of it, yes. It was a General Instrument spinoff.

BROCK: Was the head of it Paul Richman at that time? Or was he…?

FIALKOV: No, the head of it was another gentleman. Again, my memory is failing me, but I can learn that. I can just ask Paul Richman who it was, [but] there was a president. Paul Richman was just head of research, but [it was] Paul Richman's research [that] interested me the most, because it was a step ahead in MOS. […] They needed money to survive, and I invested. I think Geiger & Fialkov invested twenty-five thousand dollars to keep them alive until we could work out some sort of a way to make something out of it. But I spoke to Monty Shapiro, who then headed General Instrument, and he told me [that this fellow who had left] had a non-compete kind of [agreement] signed. It would be in violation of that deal with General Instrument to do what [Solid State] wanted to do.

We didn't want to get involved in a situation that would cause litigation, so we backed out of it, and the company just closed its doors. That's when I had Standard Microsystems

employ Paul Richman and his research group of about six people. They became employees of Microsemi, which was […] Standard Resources. I was Chairman of Microsemi at that time, and it was easy to do. We didn't separate it until some months later, when we were able to get investors interested in investing in it, and it became [Standard] Microsystems. […] In other words, Paul Richman and his group essentially […] were all out of jobs, and they all became employees of Microsemi.

BROCK: Yeah. Then […] you bring them into Microsemi, Standard Resources, […] as employees to keep together, this group that has this good, new process technology.

FIALKOV: Right.

BROCK: Then it seems, while that's going on, you're also talking to a group led by Chuck [Charles] Sutcliffe…

FIALKOV: Yes.

BROCK: …in Texas, who had…**?**

FIALKOV: That was Nanosystems, Inc.[7]

BROCK: Okay. His name is familiar to me because he had been working at Fairchild, I think on MOS production or something like it or in MOS manufacturing or something…

FIALKOV: Yes. He worked at General Instrument, too.

BROCK: …before going to Fairchild. Then he left to do Four Phase [Systems] or something like that? Left Fairchild?

FIALKOV: No. He left to become a consultant of some kind. We invested in Four Phase Systems. [That] had nothing to do with Sutcliffe, I don't think.

[7] A Texas corporation, it was acquired in 1971. Its four employees were Charles Sutfcliffe (Corporate Executive), Don Richard (Sales Executive), Alton Christensen (Chip Designer), and James Hayes (Chip Designer).

BROCK: Okay. But you had known him through the General Instrument connection?

FIALKOV: Yes.

BROCK: So, that group, Nano Systems, they were…

FIALKOV: Nano Systems had a marketing fellow […whose surname] was Richard. I don't remember the first. So we got this marketing fellow, and we got Chuck. I think we made Chuck Sutcliffe President of Standard Marketing Systems for a while.

BROCK: And that group was based […] in Texas at the time?

FIALKOV: It was incorporated in Texas, but I don't think they were based there. […] This fellow, Richard, lived in California.

BROCK: Okay. […] And they were just interested in making MOS integrated circuits?

FIALKOV: Right. […] What we were trying to do is to create a team. We had the research. We needed marketing. We needed management. So, Chuck was management. Richard—again, I don't remember his first name—was marketing. And we were looking to get the design group […], which never occurred. We were trying to make a team that would make a successful company.

BROCK: It seemed to me that what Richman had was an N-channel MOS process, which was the same thing that Intel had, right […]?

FIALKOV: I don't think Intel had it.

BROCK: Had the NMOS? Yeah.

FIALKOV: They didn't have it until we licensed them. Standard Microsystems licensed it to [Intel]. Intel became an investor in Standard Microsystems at one time.

BROCK: Wow.

FIALKOV: I think they still have some warrants that require more of it. I don't remember what transpired after I left.

BROCK: That was because of the process technology that Paul Richman had developed?

FIALKOV: Yes. Standard Microsystems licensed to IBM and General Motors…

BROCK: Well, what I thought was interesting in the materials that I was looking at was that by 1971 he had this process where he would use epitaxy with MOS to… this COPLAMOS process.

FIALKOV: COPLAMOS, right. […] It would solve the problems for making N-channel MOS.

BROCK: But […] also, by 1971, he was looking to […] use ion implantation and silicon gate MOS.

FIALKOV: Yes.

BROCK: So, he was—that was—very forward looking.

FIALKOV: Yes, it was at that time.

BROCK: It must have been, yeah.

FIALKOV: And that's what interested me. But, in order to make a company out of it, you needed management. You needed marketing. You needed design. It took us a while to complete the process.

BROCK: Now, was MOS Tech [Technology, Inc.], the company that […] you would be looking at, at this time, as the comparison company? Or…?

FIALKOV: MOS Tech was a company—we had an opportunity to invest in MOS Tech, but then never did. So, that wasn't part of our plan.

BROCK: It would seem that they would be the closest competitor in terms of their plans. Were they somebody that you were following in that respect?

FIALKOV: We felt that we had the patents. So, we weren't worried about competition. We wouldn't license MOS Tech. We only licensed major companies where we could get patents in return.

BROCK: Right […].

FIALKOV: I went to school with Paul Richman to learn about licensing. The American Management Association had a couple of courses that we took together.

BROCK: I was just going to ask about technology licensing and patenting at that time in the semiconductor industry. Some people have said that early on people went for patents to have something to trade?

FIALKOV: Yes.

BROCK: And later it became…

FIALKOV: A source of income.

BROCK: Was this in the source of income era?

FIALKOV: Both. We traded in the initial stages, and later on we were able to get substantial revenue from licensing.

BROCK: And it seemed with Richman's patents, he had the patent on the COPLAMOS…

FIALKOV: Yes.

BROCK: …using epitaxy. Then he had the patent on COPLAMOS using ion implantation.

FIALKOV: He kept adding to the patent structure.

BROCK: In terms of a product plan, I mean you clearly had a technology story there. I was interested that it seemed like the initial business plan in terms of products was to use MOS or your COPLAMOS…

FIALKOV: Memory.

BROCK: …process to make memories and modem chips?

FIALKOV: Yes.

BROCK: This is in 1971. I thought that was an interesting combination, especially [the] modems.

FIALKOV: Well, they had the experience in the design of the modems. So, we stayed with that. The initial group, that Solid State group, had some work on the modems. So, we stayed with that. But we thought that the major…that the infinite need in the semiconductor industry would be for memory. We thought that if we could get a head start there, we'd be okay. It ultimately became a very competitive business, as you know. Even Intel didn't make a big deal over that. Once they had the microprocessor they felt that that was the future, and let the memory go to other people.

BROCK: At this time the modems were…I guess […] modems and memories in a way are combining communication and computation.

FIALKOV: Yes. Right. […] Memories ultimately became a commodity. So, Intel was correct in avoiding that.

BROCK: So, I saw that Standard Microsystems went public in 1972.

FIALKOV: One of very few IPOs that year.

BROCK: What was the experience of that? Was it…?

FIALKOV: It was successful. Nineteen seventy-two, I think, was a recession year or [something].

ULRYCH: It was a bad time. It was right before we went off the [Bretton Woods] Gold Standard, wasn't it? So, […] it was not [our] best of times.

FIALKOV: Yes.

ULRYCH: We [were still deep] in Vietnam.

BROCK: […] It seems like in terms of the time between…well, that it's very quick to go public.

FIALKOV: Yes.

BROCK: It was formed in 1971, and it goes public in 1972. Was that…?

FIALKOV: We thought we had a good story, and we could go public, and we did.

BROCK: So, you had this group—the research group, the process technology group—on Long Island. It seems that through Chuck Sutcliffe, you also had some sort of facility in Mountain View, [California].

FIALKOV: We did. […] We hired a fellow named Lloyd Taylor, and he headed that facility.

BROCK: Then you started building a fab in Sunnyvale, [California]…

FIALKOV: Yes.

BROCK: …when you went public. So, was your intention then to have […] mainly a Silicon Valley company, or…?

FIALKOV: We didn't know really how it would end up. But Lloyd Taylor had a very interesting background. It turned out that these two facilities started competing with each other for the capital that we had, and the ability that we had. We ultimately gave up the California facility. At that time, I was running out there every month. But, then things got very rough. We had a major contract with a Japanese company that we were going to [fill] in Sunnyvale. When times got rough, we lost that contract or they didn't continue with the contract, and we had to give it up.

ULRYCH: Which Japanese company, do you remember […]?

FIALKOV: No.

BROCK: So, when Standard Microsystems gets started, Richman's working on developing the process technology. There's the idea for modems and memories. I also saw that to get going, the initial business was custom circuits for Commodore [International].

FIALKOV: Yes.

BROCK: I was wondering what that was all about, and what Commodore was like at that time? Do you have any recollections about that?

FIALKOV: Sure. Commodore gave us a major order. When times got rough, that disappeared too.

BROCK: What were those circuits? Was that for…I'm just trying to think what Commodore was making in 1972. Were they calculators?

FIALKOV: Probably.

BROCK: Calculator circuits.

FIALKOV: Of course we were […] trying to sell calculator circuits to every calculator manufacturer at that time. […The early] 1970s were very tough years.

ULRYCH: […] The whole 1970s […]?

FIALKOV: Right.

BROCK: […] In 1972, you were the President and CEO of Standard Microsystems. Sutcliffe was for operations, and Richman was for R&D. So, you had left the semiconductor business, and…

FIALKOV: I was a part-time president.

BROCK: You were?

FIALKOV: I was still…my major activity was venture capital, but it was important for us to have that company succeed. We kept financing it. When we became the major financial backer, I went in and tried to manage it. Paul Richman was essentially a research person at that time; [he] had no interest in management, so I did, really, until we could find a full-time manager. We ultimately did. We hired this fellow Brozinsky, who had been the head of Semi Metals, Morton Brozinsky. Against Richman's objections, he became the manager. He was pretty good at controlling expenses, and the company prospered under that situation. Paul threatened to resign, but I told him to hang in. After a number of years, Brozinsky was interested in selling the company so he could cash out, and Paul wasn't. Paul won that argument, and Brozinsky left, and we promoted Paul to the president's job, where I remained as chairman for a while.

BROCK: It was three years or so that you were—three […or] four earliest years…

FIALKOV: Yes. That I was involved.

BROCK: …as the president.

FIALKOV: Right. But times were rough [and] it needed a full-time president.

BROCK: Right. Well, what I was very impressed by was this DRAM [Dynamic Random Access Memory] that Standard Microsystems introduced to the market in, well, it must have been right around this time, 1973, something like that.

FIALKOV: Yes. We thought memory would be a very good future if we could get more memory on a chip than the chip that was being used then by Intel. So, we designed a chip to do four times the capability of the Intel chip. We ran into a lot of reluctance at the market, because the major companies didn't want to put their eggs in a small, unknown company. They were promised by other companies, like Texas Instruments, that they would have a chip in place within a year. So, we couldn't sell it.

BROCK: Hmm. I also thought it was interesting that Intel's 1103 DRAM, [which] kind of made that market, was not the easiest chip to use.

FIALKOV: No. People were unhappy with it and wanted a better chip. Still, it was very difficult to break into the market for an unknown company.

BROCK: Well, one thing that I saw going through the documents—and I think it was some writings you had done both contemporaneously and then slightly later in time to this product—was that Standard Microsystems had this great, N-channel COPLAMOS process, and you created this 4K DRAM that essentially had four 1103 type circuits…

FIALKOV: Yes, in one chip.

BROCK: …in one chip. Then it turned out people didn't like the 1103 […].

FIALKOV: They wanted something better.

BROCK: Easier to use circuitry; that's how MOS Tech really got in there—on the 4Ks. That was the first time I had ever, I think, really understood that competition of the 4K DRAM, which was a big deal.

FIALKOV: Yes. People bought the Intel chip, but they didn't love it.

BROCK: So […] it seemed, [then], with the problems that Standard Microsystems was facing with the 4K DRAM, that […] it started to explore micro controllers and other chips for peripheral equipment.

FIALKOV: Yes.

BROCK: And displays, and things of that nature.

FIALKOV: Yes.

BROCK: Could you talk about that as a market?

FIALKOV: […] Once we licensed Intel and began working with Intel, we felt the important thing was to support Intel. Where Intel was selling the microcomputer, we would sell all the ancillary circuits or as many of them as we could come up with designs for. So, essentially that's what we did.

BROCK: For all the integrated circuits that would go into all of the other equipment associated with…

FIALKOV: Yes, with Intel's chips. So, we had a friendly relationship with Intel, and that's what happened.

BROCK: So, when you brought in Brozinsky, in 1975 or so, to run Standard Microsystems, and he closed out the Sunnyvale factory, did you also have then a factory on Long Island that was ready to go?

FIALKOV: Yes. We made chips on Long Island.

BROCK: When Brozinsky came in and closed down Sunnyvale, […] did you lose Sutcliffe and this marketing guy in that transition?

FIALKOV: I think the marketing guy probably stayed on, but Sutcliffe didn't. Lloyd Taylor didn't. […] We weren't able to support too much overhead.

BROCK: Do you know what they did afterward?

FIALKOV: Sutcliffe became a consultant after that, which probably was the best thing for him, because […] it turned out he was really not a good operating guy. I don't know what happened to Lloyd Taylor, probably went to work somewhere in the industry.

BROCK: Well, so it seems that then in the second half of the 1970s, it was really a lot of licensing of the COPLAMOS patents.

FIALKOV: Yes.

BROCK: Including to people that you had been competing with before, Texas Instruments, MOS Tech, and American Microsystems. Interestingly, there's this licensing to Japanese semiconductor [manufacturers] Hitachi, [Ltd.], and Fujitsu, [Ltd.]. Were you involved in doing those deals with the Japanese companies?

FIALKOV: Mostly [Paul Richman was]. He became our licensing executive, because he understood what we wanted in return.

BROCK: So, you remained on the board of Standard Microsystems.

FIALKOV: Yes. […] It was a certain age after which you could not run for election. I remained on the board until I was about seventy-six years old, and then left it. I had my partner in the latest venture capital operation, Bob [Robert M.] Brill, take my place on the board. He stayed on the board for a number of years.

BROCK: What was your personal ownership stake like in Standard Microsystems?

FIALKOV: Well, the maximum personal ownership was about four hundred thousand shares, which I kept selling in order to continue doing what I was doing. Ultimately, I don't own any

shares now. I gave shares to my children, grandchildren, whatever. I'm not in contact with the new management. Don't know them at all.

BROCK: Let's see. Well, then it seems that through the 1980s, Standard Microsystems was mostly a modem chip and terminal display chip company. And then in the…

FIALKOV: Communication chips. A bunch of different kinds of chips, ancillary chips to the microprocessor.

BROCK: Then it's later, sort of the 1990s, where it really became involved with the networking chips, the local area networking [(LAN)].

FIALKOV: Yes.

BROCK: I saw that Frank Wanlass joined Standard Microsystems in the 1980s. Now, he was the person you had worked with before…

FIALKOV: Yes.

BROCK: …at General Instrument?

FIALKOV: He was one of the people we had hired to start the microchip operation. He was a very, very talented person and we hired him for a number of years. I don't remember what became of him.

BROCK: Could you talk a little bit…did you have much personal interaction with him?

FIALKOV: Oh, yes.

BROCK: Because he seems to have been a very important figure in the development of the whole MOS integrated circuit.

FIALKOV: Yes, he was.

BROCK: But he seemed to move around a lot.

FIALKOV: That's true.

BROCK: Could you just talk about him as a person and his contributions, or your impression of him?

FIALKOV: I'd have to talk a little more with Paul Richman to get a complete story on that. I was not involved in the management of the design and research and development, although he was a very important contributor. But, I was no longer involved in a technology sense.

BROCK: What about earlier at General Instrument […]?

FIALKOV: He was part of the team. He was part of that team of six people. I don't really remember the names of very important members of the team who came with him. I guess I've been so long away from it that I just don't remember.

BROCK: […] I also noted that DEC [Digital Equipment Corporation] was the biggest customer for Standard Microsystems for some time […].

FIALKOV: Oh, yes.

BROCK: Maybe that was in the later 1970s. I was just wondering if you could talk about them, and what […] part they were buying from Standard Microsystems.

FIALKOV: […] No. I just wasn't involved in the details at the later stages.

BROCK: Was the relationship with National Semiconductor in the early 1980s something that you were involved with at all?

FIALKOV: No.

BROCK: Okay. Well, then maybe, I guess, that completes the questions I had about Standard Microsystems, but maybe we could talk about [how] it seemed to really prosper in the 1990s as a firm with LAN chips.

FIALKOV: The technology, right, that they followed. But it never became a major company. It still isn't today.

BROCK: […] So it's still ongoing […] today.

FIALKOV: Yes.

BROCK: And so that investment company that you had that was called Standard Resources, got renamed Microsemi…

FIALKOV: [Yes], Microsemi.

BROCK: …as an investment company, but that has developed to become a semiconductor manufacturer?

FIALKOV: In other words, they wound up with a good number of Standard Microsystems stock, which they sold. […] That capital helped them expand and become an important company in their field. So […] their investment in Standard Microsystems paid off and they didn't have to raise money publicly. They sold stock.

BROCK: Now, did you have a board involvement with them throughout the same time period?

FIALKOV: Yes.

BROCK: And they acquired it when General Instruments got out of semiconductors?

FIALKOV: Well, they spun it out. It became Microchip Technology and it went on to prosper. […] I think they had a capitalization of over a billion dollars.

BROCK: So, those are three ongoing semiconductor manufacturing concerns?

FIALKOV: Yes.

BROCK: Looking back over these different eras—there's the germanium transistor era, the silicon integrated circuit era, the MOS large-scale integrated circuit era…all of which you've been involved in directly through these companies—which time did you find the most exciting and interesting of the three?

FIALKOV: As long as I was personally involved, they were all exciting and interesting: the licensing, the movement into microchip technology, and so on. It was all very important. I was always interested in the future and tried to be there technologically in time to take advantage of it.

ULRYCH: [I'm] trying to understand […] the attraction for you […]. Was it the action, the sort of anticipation of what the future was going to be? Being right in what you thought? Or…?

FIALKOV: Yes. I was always trying to keep up with the developments—the future developments—and trying to be there and enjoy it. After a very early period, I was never interested in making money. I was always interested in being part of a vibrant, changing technological environment.

ULRYCH: That was one of the questions that [was coming] in my mind, was when you got involved in the very beginning in this sector of industry, did you think you would be in the middle of innovations that would really help to transform the world, or […] when did you begin to […] think it was something like that?

FIALKOV: When I was a young lad, I wanted to be an engineer and I wanted to build a bridge across the Atlantic Ocean. [laughter] So, when I became involved in venture capital, I invested in communications companies that did that through satellite communications. The first one…I'm trying to remember the name. [It] was an important one and was sold out. Then the leader of that started a company called Primus Telecommunications, and I was on their board. They raised over a billion dollars and grew to doing over a billion dollars a year of business, but not very successfully in the long run, because they borrowed too much money and ran into trouble. My philosophy was sell stock, don't borrow money. But management, when they could borrow money very easily, borrowed money. When times got rough, […] they couldn't [cope] with it. So, I invested in a company that's still in business and doing well, Globecomm

Communications. I was a major investment in communications, international communications, which was my bridge across the Atlantic [Ocean].

ULRYCH: So, […] when you went into venture capital, were you consciously thinking that you're trying to realize these childhood dreams, or…?

FIALKOV: Sure. […] Look, I was a young lad during the Depression. I used to live in a neighborhood where there were manufacturing facilities. I always said to myself, "[I'll] hire all my friends, and my relatives," and I did. Probably not to my advantage in every case, but I did. I accomplished that dream, and certainly with my grandchildren I accomplished it. The bridge across the Atlantic became a communications bridge, not a real bridge. But what drove me was the following. By the time I was about forty years old, I had enough money to do what I wanted. […] I never wanted a yacht, but to have a good home, to raise my children, send them to college, grandchildren to college ultimately. Those dreams were accomplished. But by the time I was forty, I had finished…during my undergraduate work, I had taken a course in psychology and went through the five stages [of realization], where you start off with you want to be able to afford the necessities to live. The second one, to enjoy certain additions like health insurance and other things that go along with having a good life, and the third one to be able to afford luxuries. The fourth one was prestige, and the fifth one was power. Having been the head of a public company, you were forced to go after the prestige. I didn't like that and I certainly didn't feel comfortable with having power over seventy employees' lives and their dreams and ambitions.

So, I had to cope with the problem of what do I want for the rest of my life. I decided, ultimately, after lots of worrying, what [I] wanted to do next. […] Life is a game. It ends the same way for everybody. The important thing is to choose a game that you like to play, [and you] play to win [of course]. But you lose some, you win some. It's like everything else. But, the thing to do is to choose a game—and I chose venture capital to enjoy life. I gave up opportunities other than venture capital just to play that game. That's what my life has been all about. Once I had enough money, I wasn't looking for more. I had enough. [That] was enough to do whatever philanthropy I wanted to do, to do what I could for my family, and for myself. So, since I've been about forty years old, that's been my life's motive—to play a game. I used to say, "If I could retire and play tennis the rest of my life, that's no good, because work is fun, and tennis is hard work." [laughter] So, I chose the game of venture capital. I enjoyed it. I had a good life. I was able to do whatever I wanted. I was never interested, like my grandson is…he has a house with thirteen bathrooms. I never wanted [that]. I drove Cadillacs, but I never wanted to be ostentatious. […] So, my life has been playing a game. Venture capital is a very, very good game that I enjoyed up until four years ago, when I essentially left it.

ULRYCH: And you miss it?

FIALKOV: I miss it, and I miss tennis. But I make the best. My wife keeps me busy. She's nine years younger than I am. She's got the energy, and I go along. […] I don't think when I was forty and I got to that point, and I said, "I don't want to work for prestige. I don't want to work for power." You get a little prestige when you're philanthropic, and people put your name on their boards, and so on, but that isn't what it's all about. What it's all about is enjoying your everyday life.

ULRYCH: Well, […] when you [started] to talk about [this] hierarchy, I thought of Maslow's [Hierarchy of Needs] pyramid.

FIALKOV: Yes.

ULRYCH: Because he had another one where actually after you go past this prestige and power, there's this final topic called self-realization.

FIALKOV: Oh.

ULRYCH: […] People go off and write poetry.

FIALKOV: Okay.

ULRYCH: So that was more of the game.

FIALKOV: I came to that conclusion without reading Maslow. Enjoy the game. […] It's a very enjoyable thing to invest in startups and to see them grow and prosper. My major, major home runs have been in startups. When I got involved with my latest group of partners, they were too conservative to invest in startups. They invested in the same kind of companies, but not startups.

ULRYCH: Didn't want to take any risks.

FIALKOV: They didn't want to take the risk. So, I didn't enjoy that as much. But, […] my eldest grandson started a venture fund called First Round Capital, which invests in startups. So, I see the results in his, and he's doing very well.

ULRYCH: […] Did you influence in some way his interest in this type of investment?

FIALKOV: Only through what he knows about what I did, and what I kept doing. As I say, they interned, each of them interned [with me]. One of them invests in startups, the other one doesn't. The other one is a vice president of a several hundred million dollar fund that invests in going concerns, concerns that have made it past the startup stage. But my eldest grandson has a fund that's aimed at first round, [hence], First Round Capital.

ULRYCH: [But] it seems as […] if it's [almost like] a gambling […].

FIALKOV: It is.

ULRYCH: […] You calculate the odds, I guess […].

FIALKOV: It's really hard to calculate odds. You do what you think is good […].

ULRYCH: That'll bring success.

FIALKOV: [That'll] bring success. And of course, you're interested in the people in whom you invest. They have to be willing to really spend their lives in total efforts in making it a success. You're not looking to invest in a guy who's not going to really put his entire all into it.

ULRYCH: So, that [was what] helped guide you in making your investment decisions.

FIALKOV: Yes.

ULRYCH: Did you find that interaction with those people also part of the fun?

FIALKOV: Part of your enjoyment. Certainly. You're […] creating hundreds of thousands of jobs with a successful venture. You're making lots of millionaires. That's how you get your satisfaction.

ULRYCH: Did you find other people in venture capital who shared your [sets] of values? You already mentioned you […] have partners who didn't want to do that […].

FIALKOV: [Who] didn't want to take the risks that I took.

ULRYCH: But did you also find people who shared your [sets] of values […]?

FIALKOV: Well, my grandsons. [laughter] They're [at both ends]—one is in startups and one is in non-startups, and they're both enjoying it. So, I'm happy. But that is essentially what's driven me, rather than making money. It was my children. My son was too young at the time I decided to do it, and I thought doing it as a, sort of, retirement. You have enough money, retire. But venture capital is hard work. It never turned out to be a retirement where you just sit back and watch your money grow. So, there are times, like [times of] recession, when you might have five investments in difficulty at the same time. [My latest fund, in] which I'm still a small owner of a general partnership, has got maybe six companies that were scheduled to go public this year that couldn't go. So, the ultimate liquidity is still in doubt, even though they're successful companies. But [I've lived] through a number of periods like this and some say this may be the worst, but it's really not. It cycles.

ULRYCH: So you think people are over-dramatizing the situation?

FIALKOV: Well, for people who have been hit very hard by it, it's not over-dramatization. They're suffering.

ULRYCH: But […] when you listen to the news, […] everyone talks about it as being the absolute, most difficult period since the Great Depression.

FIALKOV: Well, 70 or 80 percent of them never lived through the other one, and I lived through it. It was devastating to families with difficulty, including mine, when I was a young child. But whatever game you're playing, you have to keep playing and you have to keep trying to win. That's where you get your satisfaction. If you lose one, you lose two, there's another one coming up where you'll win. Venture capital is that kind of a business. The percentage that you win might be 30 percent, and another 30 percent may be a break even, another 30 percent could be losers. But if 10 percent are big winners, you're a big winner. It's that kind of a game. Obviously, a method of gambling, but I'm not a gambler. […] If I would lose a hundred dollars on slot machines, I'd feel terrible.

BROCK: I had just one other question for you which was about some of the people whom you have particularly admired or been particularly impressed by when you were working in these different areas. So, in electronics or in venture capital, people who you encountered that you found to be particularly impressive.

FIALKOV: Well, I've seen the development of Paul Richman […]. Here was a fellow who only wanted to do research the rest of his life, and he ultimately became adept at research. He went to Japan for two years to help Standard Microsystems build a situation there. I've seen him grow in stature and ability. Those things I appreciate. Of course, in my conversations with Bob Noyce, I had a great deal of respect for him, and too bad he didn't live to survive as long as I did. Of course, Gordon [E.] Moore…you know you've met important people. But, from the point of view of making money, when I started Geiger & Fialkov, an attorney who was a prospective investor in Chicago asked me to meet with his advisor, and I met with Warren [E.] Buffett. Warren Buffett advised him to make the investment. But I should have invested [in] Warren Buffett and then I could have built structures like this [the Chemical Heritage Foundation], like [Donald F.] Othmer did. So, that's [life]. […] Arthur Rock, of course, a very impressive venture capitalist who was a role model for me. Sometimes a very difficult person, but a very good guy.

ULRYCH: So he inspired you, in a sense, to go into venture capital?

FIALKOV: Oh, yes.

ULRYCH: So, […] you […] met him, saw what he was doing and you thought…

FIALKOV: I met him. He was with my Wall Street banker as a young lad. He went to California to start Davis & Rock, and I invested a hundred thousand dollars, and wound up with a couple million. That looked like a good deal. It looked like good business. So, it inspired me to try venture capital, although I never wanted to go to California. I'd have been a much richer man if I did, but, as I said, I didn't do it for getting more than I needed in the first three steps of realization. And that's the way it was. When I had an opportunity to go in California and take over one of Arthur Rock's major investments, a computer company that was ultimately sold to Xerox [Corporation] for a billion dollars, I turned it down. My daughter and my family said, "Why do you want to go?" I know lots of people that went out to California, their families broke up…

ULRYCH: Right.

BROCK: Was that Max Polefsky's thing?

FIALKOV: Yes.

ULRYCH: [Could] you tell that story?

FIALKOV: Well, Max Polefsky was an investor in my venture capital fund. He was an investor in that computer company. He was ultimately on the board of Intel, but after the first fund, I sort of lost contact with him.

BROCK: That was the Scientific Data Systems that was sold to Xerox?

FIALKOV: Yes. Scientific Data Systems. [I was] given the opportunity, when I left General Instrument, to go be president of Scientific Data Systems. Arthur wanted to support me in that, but my family said "Don't," and I didn't. My children were growing up. They were happy. I was happy and making that big a change in my life…I never changed my domicile for a job. I commuted.

ULRYCH: And you never regretted; […] you didn't have any second thoughts [about that one]?

FIALKOV: I don't [have] any regrets of my life, I think. I told my children, my grandchildren, "When I die, don't make any big speeches. Just say I had a wonderful life and realized enjoying a wonderful life." That's it. Although, when I was honored by the Long Island Venture Capital community, my son made a very nice speech. I probably sent you a copy. My son is an attorney. He's a deputy general counsel for WGBH and he's got a very nice job. But when he sees how my grandchildren are doing, he says, "It must skip a generation." I wanted him to join me in the venture capital business, and he […] and his wife never wanted to give up their life in their location where they are. I respected that. The mistake I made was not having my daughter join me, because my daughter became a successful real estate broker. [laughter] She might have been very good at venture capital. But her sons are doing the job.

BROCK: So, it's your daughter's sons who are the most successful?

FIALKOV: Yes. She's eight years older than my son. My son has a son who just graduated from George Washington Law School, and a daughter who's in her final year at Skidmore

[College]. She'll probably go on to become a psychologist like her mother and her grandmother. So I'm blessed.

ULRYCH: So, half the family became entrepreneurial and the other half of the family goes into law and a […] professional life.

FIALKOV: Right. But each has a happy marriage and good children, and so on. [My grandson] who graduated from George Washington Law School had a job offer from a very major international firm. They're paying him to do nothing because they want him to stay until March, before he'll go to work full-time. So, they're giving him a substantial stipend to do nothing and just wait. You believe that?

ULRYCH: Well, that's pretty amazing. […I've never] had that opportunity.

BROCK: No, sadly, no.

FIALKOV: No. I was never unemployed for more than two days. [laughter]

ULRYCH: Well, we have our lunch here…

BROCK: Well, let me switch these…

[END OF AUDIO, FILE 2.2]

[END OF INTERVIEW]

INTERVIEWEE: **Herman Fialkov**

INTERVIEWER: **David C. Brock and Richard Ulrych**

LOCATION: **Boca Raton, Florida**

DATE: **27 February 2010**

FIALKOV: He was one of twelve [brothers and sisters who survived] and they all have lots of children. And the story is that when Chaim Weizmann came to New York years ago, and made a presentation at the old Madison Square Garden, there was a whole balcony with a band of relatives and Chaim Weizmann, and there were hundreds of them. Of course, every family had many, many children. […] My father had told me that he was [Weizmann's] cousin and he had seen him in Pinsk when Weizmann was a student there. My father was quite a bit younger, I think about eight or nine years younger than Chaim. And I saw in a biography that his father's name was Fialkov.[8] So, I wrote to [the] biographer, Isaiah Berlin, and said, "How come?" And he…he said it had some…he thinks it had something to do with service in the Czar's Army. I was curious to learn more about it, and, actually, I found a biographer that told us that there were seven sons in that family, and the two youngest kept the name Fialkov because they were not of draft age. And the five older [children] took names of family in town that had no sons, because if you were the only son in a family, you were exempt from a draft into the Czar's Army, and, after which, they never heard from you again.

ULRYCH: Yes, twenty-five year service.

FIALKOV: So, the names were Shapiro, Rosenweig, Berman…and many other names. But then when I got to Israel and went to the Weizmann Institute and there was a picture of his [grand]father, [Azriel] Weizmann Fialkov…. So it was an interesting fancy relationship […]. There's some DNA in there…

ULRYCH: You never got in contact with any of the family of Weizmann?

FIALKOV: No, I never […] was in contact with them.

ULRYCH: […] I know there [were many]. […] I really don't know how many children he might have had.

[8] Isaiah Berlin, *Chaim Wiezmann* (New York: Farrar, Straus, and Cudahy, 1954).

FIALKOV: Who?

ULRYCH: Weizmann, Chaim.

FIALKOV: He had quite a few. And of course, one son was also named [Isaiah] like his father; [he] was a military man in Israel with a history, and actually wrote a book. But I thought it was interesting to note that there was some chemistry in my DNA. [laughter] But not that it meant anything.

[…] My major problem with chemistry was when I returned from service […] and had previously gone to City College. […] When I went to NYU, they allocated credits depending upon what I had done at City College. And I had studied a year of chemistry at City College, but this was many years later, and they gave me credit from half the course, not the full course. When I studied chemistry, the final half at NYU, where I was going for my degree at night, I was doing fine. But what happened was, when they gave the final exam, it was on the total […year], and I didn't know any of the problems that took place […nine or so years earlier]. I got an A in the lab work and a D in the [course]—the only D I received at NYU…everything else was A and B's, no C's. […] I was graduating up in the top 5 percent of the class […]. It bothered me; it kept me from getting […] a degree with honor.

ULRYCH: […Well], those introductory courses in chemistry […] involve a lot of memorization. You have to remember the color of ions and stuff.

FIALKOV: And when I took that final exam, […] it flabbergasted me because it […] wasn't anything we had covered during the semester […].

At any rate, all my grades at NYU were A's and B's […except] chemistry. And as I told you once before, when I became involved in semiconductors, I went to my chemistry book and […] looked for germanium and it says, "We won't discuss it. It has no commercial usage." [laughter] *Smith's College Chemistry*, I still remember the name of the text.

BROCK: So, […] the connection to the Weizmann family, [was that] something that you had heard about as a younger person, and then really explored […] as an adult?

FIALKOV: My father had told me that he was a cousin. But then there was a biography by several authors, and Isaiah Berlin, who was in London, [England], at that time, wrote that his father's name was Fialkov, and I wrote to him. […] And he advised me to get in touch with the

archivists at the Weizmann Institute, which I did. He explained the story about service in the Czar's Army, and […] I learned I came from a family of draft dodgers. [laughter]

ULRYCH: […] Everyone tried to avoid the Russian Army.

BROCK: […] Did you have a lot of family in Israel that you were in contact with […] when you were growing up?

FIALKOV: No […. I] had some family in Israel; it mostly came from my mother's side, because my grandmother was one of six siblings, and their name was Bacher, and most of them immigrated to Canada. And we had reunions every couple of years, and they were called the Bacher Family Reunion. Some of them pronounced it Bacher. Some pronounced it Bacher, but it was still B-a-c-h-e-r. Somewhere I have a whole family tree from that family. There were hundreds who came to the reunions. But it finally stopped [when] the internet [came and] you could keep in contact.

ULRYCH: And did some of them [immigrate] to Israel, some of your mother's…?

FIALKOV: Some of them…

BROCK: From Canada?

FIALKOV: No, from Europe […]. My mother was from Austria-Hungary […], but it became part of Romania after World War I. […] It was in the northern Carpathian Mountain Region almost […] next to Russia. […] And the area was called Bukovina […].

We had dinner last night at a cousin's. [She's] a survivor of the Holocaust, and lives close by in Boynton Beach, [Florida]. We had dinner at their house, and that's from the mother's side. My grandson, Joshua, is really the family historian. He has looked into everything, where we came from, and so on, so he's taken over the job.

BROCK: Well, I thought maybe we could […] shift gears a little bit, then, and talk a little bit about your history of the semiconductor-related investments. And I thought one thing I might ask you would be to talk about before your formal career in venture investing, which I guess begins…is it 1967 that it [began]?

FIALKOV: It's 1968.

BROCK: In 1968.

FIALKOV: Actually, I was a limited partner, much earlier in 1961, of a venture capital fund called Davis and Rock (Arthur Rock).

BROCK: Oh, sure.

FIALKOV: Arthur Rock was a young man in the investment banking field, and they were our investment bankers at General Transistor, so I knew him. And when he left and went to California and started a venture capital fund, I invested a hundred thousand dollars as part of it. I think it was just several million dollars, and he made some very successful investments. I think it came out to about two million when it finished.

BROCK: And how, what was the…so that was the first Davis and Rock fund.

FIALKOV: That was the first Davis and Rock fund. And, actually, he invested in […] my first venture capital fund in 1968. The last contact I had with him was several years ago, and I wanted him to know that because of him I have two grandsons in the venture capital business. […] So we had some correspondence then, but I haven't seen him since.

BROCK: […] So investing in a venture capital fund in 1961 was not the most common of things to be doing […]. The whole dynamics of venture capital were really in relatively early days at that time.

FIALKOV: Yes.

BROCK: Is that correct?

FIALKOV: Yes. But, he invested in Teledyne, which started a semiconductor—or acquired—a semiconductor operation. […] When he invested in Intel, of course, […] he rounded out their first investment. And my first fund invested a hundred thousand dollars in Intel, which, of course, we didn't keep long enough for it to be worth a billion. But that's life. […] But even before then I was on the board of a company in Long Island, which sold its assets—I'm trying to

remember—to another company. It became a public investment company, and we invested in American Microsystems when it started. And […] that worked out okay.

BROCK: Well, I was just wondering about your participation […] in that first Davis and Rock fund. Was that […] a [very] unusual sort of investment for someone to make […]? I was just wondering how you came to…

FIALKOV: To invest in…

BROCK: …to participate in it? Did Arthur Rock approach you? Did he have to sell you on the idea of venture investing? Or…?

FIALKOV: No. The history is as follows. When I was at General Transistor, we had just expanded and acquired a factory in Rhode Island, in Woonsocket, Rhode Island, and we were busy getting that going. Arthur came to me and wanted General Transistor to invest in this group of five or six people that ultimately was backed by Fairchild. And I told him, "I've just got my hands full right now," so I turned it down. This was the Fairchild Group, I think there were six, and Jean Hoerni, Jay Last, and several others, and, of course, Bob Noyce. So, having missed that investment, I [decided…] not to say "no" to him again. So when he came up with the idea for a venture capital fund, I said, "I'm joining you." He raised money for Teledyne, and I participated in that as well. That I did as a personal thing […] before the venture capital fund. So the story is I would never say "no" to Arthur Rock again.

BROCK: Because by that time, Fairchild Semiconductor had become a very successful operation.

FIALKOV: Actually, […] at the very beginning, the investment in Intel was a personal investment, but when I started the fund, I got approval from everybody to throw that into the fund, [that is,] into Geiger & Fialkov.

BROCK: […] Were you…I'm just wondering, again back to doing venture capital, […] what sort of communications you would get from Davis and Rock about what was going on?

FIALKOV: Oh, sure.

BROCK: Would you meet the other […] limited partners?

FIALKOV: Sure.

BROCK: Could you just…?

FIALKOV: Jay Last. Jay Last was a member of my fund, and so I followed what was going on. And of course Arthur gave us quarterly reports, which I don't think I've saved, but maybe I have someplace in storage. Is that of interest to you?

ULRYCH: […] It's interesting…

BROCK: I think it would be very interesting to see. Did the investors in something like Davis and Rock or Geiger & Fialkov, was there ever a time when the investors met together with you or was it through correspondence generally and telephone calls? Or, how did that work?

FIALKOV: I think in the early days of venture capital with Arthur in California, I don't think he had annual meetings with investors that they attended. Of course, we did at Geiger & Fialkov. And most venture funds do have an annual […] meeting. The one I'm still connected with as a non-participant, except as a small general partner, […] has annual meetings.

BROCK: Where the investors physically come together with the managers of the fund?

FIALKOV: Yes. And at these annual meetings, they usually have three or four of their portfolio companies make presentations, especially the more successful ones.

BROCK: And […] that first Davis and Rock fund that had a certain lifetime…a couple years was it or…?

FIALKOV: Seven years.

BROCK: Seven years. Was that […] standard practice for venture funds in the 1960s […] at the outset?

FIALKOV: Later it became ten years, but at the beginning it was just seven years.

BROCK: Okay. So, people knew that their investment was committed for that period of time.

FIALKOV: Sometimes you extended it a year or two in order to have liquidity, […] but it was normally something that you expected to have a finite life.

BROCK: Through your experience with General Transistor, General Instrument, up until this period of the 1960s or […] during the 1960s, did you have increasing interactions with Wall Street and the investment community in terms of handling, for example, the stock of General Transistor […]?

FIALKOV: Absolutely. I spoke to the analysts. We had a…and every time we had a public offering, we had to make the rounds of all the major brokers throughout the country. So, I did that. I did that for General Transistor. I did it for Standard Microsystems, where I served as president for a while, and then as chairman, and so I was involved in their public offerings. I think I traveled a hundred thousand miles a year by air, because I was involved in their private financings and their public financing and we had a facility in California.

BROCK: Right. In thinking about the period […] before you started Geiger & Fialkov […]. I'm just wondering about […] the sort of investment and finance community at that time. Was it a smaller group of people? Were you seeing the same people, interacting with the same individuals time and again, or was it more that you were dealing with the same organizations time and again […]?

FIALKOV: Well, I had met many of the people who were investors in Davis and Rock.

BROCK: Okay.

FIALKOV: And some of them served on boards on which I served. In other words, there was connection. Arthur […] was an investor in the Benrus Watch Company, [Inc.], and since he was in California and didn't serve on New York boards, I served on them. And there were…I'm trying to remember names, but they don't…at my age they don't come to me quickly. A fellow's name was Sandy [Sanford Kaplan] something-or-other, also served on the Benrus board, and was also one of the Intel board members. So there was interaction among the people who had invested with Arthur Rock.

BROCK: And it would be…

FIALKOV: Especially with […] the Fairchild people who later moved to other semiconductor companies. Some of them moved to the semiconductor companies formed by Teledyne. And as I told you, Jay Last was an investor in my venture fund.

BROCK: […] When you were doing your personal investing prior to getting involved with venture capital in the 1960s, did you have a strategy for your personal investing that you carried over with you into your venture capital investing?

FIALKOV: I think most of the personal investments in ventures was through Arthur Rock at that time.

BROCK: Okay.

FIALKOV: I didn't pursue it on my own. But my partner in the first fund, who was Richard Geiger, and I served on a board of a company in Long Island that I told you sold its assets, I think, to Varian, and then invested that money in ventures including AMI, when it started. So, I was on the board of a small investment company that later changed its name to Standard Resources. […] I was Chairman of the Board at that time [at Standard Resources. I was the investor who] put up the money […] to form the group that ultimately became Standard Microsystems. The profit that Micro Semiconductor Company—the name was changed to Micro Semiconductor, [which is now called Microsemi]—made on their stock in Standard Microsystems helped them become a strong, profitable company, and they're alive and kicking today.

BROCK: […] I had the opportunity to do a short interview with Arthur Rock, and I asked him about […] his strategy. How did he pick these ventures to invest in, and how he would [stay] abreast of all the technology to be able to do that? He said, "Well, I don't really follow all the technology. I choose to invest with *people*." And I was wondering [if that was] something you talked with him about in this period?

FIALKOV: Absolutely. Oh, sure.

BROCK: Could you talk about what that concept was or just about that?

FIALKOV: You wanted people who you felt would devote their life and energy to the company and never quit. […] Most of the really successful ventures that I invested in, I invested in when they were startups. So [I was] going on the basis of people.

ULRYCH: You knew them well enough.

FIALKOV: And you judged them, and you knew them. It was before you used psychologists, who'd interview them and tell you something about them. You had to make judgments on people. […] People who [want to] start a company and […] live a normal life, take vacations when it's vacation time, and so on, [they aren't] who you want. You want people who really devote all their energy to succeeding. You look for people who are intelligent and bright.

BROCK: But you're […] looking for dedication […]?

FIALKOV: Absolutely. […There's] so much trouble in the early days of any venture, so […] if the guy is a quitter, it's gone.

BROCK: Because there will inevitably be a whole host of problems in the early days.

FIALKOV: That is right […].

ULRYCH: […] I'm just curious: these were people that you already knew very well, or did you have that capacity in a short period of time to evaluate them?

FIALKOV: No, it isn't people whom you knew well. I invested in a couple of Israeli companies […that] were very successful. Like the DSP Group, which is still a public company, [and] DSP Resources, which they spun off and which was sold to Intel for 1.7 billion dollars. And OPAL, which was sold…

BROCK: I have it somewhere in here. […] Applied Materials.

FIALKOV: Applied Materials. That was […] very successful. But these were people […who] don't give up.

ULRYCH: And you've had the gift of […] analyzing and assessing an individual in that way.

FIALKOV: Right. And if you didn't want to keep backing people who weren't […] devoting 100 percent to their energy…

ULRYCH: […] I'm just curious as to how you acquire that ability […]. I know that you probably can't answer that, but […] it's very interesting[…]. What did you base that on? […] How do you know in a conversation that that's the person you, you meet? And hope that…

FIALKOV: With some people you learn it in the first conversation.

ULRYCH: Really. What are the tells that give that [away]? I hope I'm not diverting the conversation.

FIALKOV: I don't know. I don't know what it is.

ULRYCH: It's just something instinctual.

FIALKOV: [Say] the guy is selling himself and […] his past experiences […]. You see what happened there, and …

ULRYCH: And you see that he had that he had drive then.

FIALKOV: I could tell at the first two-, three-hour meeting.

ULRYCH: What this guy was.

FIALKOV: Right.

ULRYCH: Okay.

FIALKOV: […] You didn't want the losers, and I can't tell you how…

BROCK: […] Am I correct in thinking that the types of investments that both Davis and Rock were making and Geiger & Fialkov were making in this early period, were investments in technology-based companies. Is that right?

FIALKOV: Not exclusively, but I think at Geiger & Fialkov it was technology. Arthur invested in other companies as well, like financial companies […].

BROCK: Okay. I didn't realize that […].

FIALKOV: His major successes were his semiconductor [investments].

BROCK: […] But they were also, as you mentioned, making investments in things like a watch company…

FIALKOV: Yeah.

BROCK: …which I guess is really about…

FIALKOV: It was a friend of his from college.

BROCK: Again, an investment in people.

FIALKOV: Yes. […] He graduated from Harvard with this fellow who acquired Benrus, and they acquired a jewelry company called Wells. This became Wells Benrus [Corporation].

BROCK: Well, I was wondering […] about the balance between when you're making an investment in a technology company, a semiconductor company let's say, or semiconductor related company…. On the one hand, you're trying to evaluate the people, their capacities, their passion and dedication, but you've also got to…

FIALKOV: Look at their experience.

BROCK: I would also make sure that their technology's story rings true, that this seems like something that you could do and could derive profit from.

FIALKOV: […] We, Geiger & Fialkov, invested in a group [that] was an outstanding development group for the National Security Agency. They had worked on software and semiconductor equipment […] for the NSA that would make sure that all the communications had 0 percent possibilities of being wrong. We invested in them because we knew that they were an outstanding design group, but they chose the wrong product. […] The world didn't want that product, and they could just as easily have been the first ones to come up with a computer with their knowledge and so on. When I found the group and hired Paul Richman's group to start […] what ultimately became Standard Microsystems. I wanted to tie that in and merge it with the other.

ULRYCH: […] That [makes] sense.

FIALKOV: […] But they didn't want to, and you can't force them to merge, even though we controlled the company. They sold out. When it came time to merge the companies, they decided they would rather sell to AMI, so they merged into AMI. We were left without a design group, and so we had to go find one. But they were very distrustful of us northerners. They were a very strange kind of people, but they were fantastic designers in the earliest days of semiconductor equipment.

BROCK: […] That was an MOS integrated circuit design group.

FIALKOV: I don't know if it was MOS, but they accomplished what they projected on schedule, on scheduled cost, perfectly, because they had done it before at NSA. But it wasn't the right product, and so here they were, what they promised, they succeeded in, but they didn't have anybody among them who knew how to go out and talk to customers and find out what they wanted and what they didn't want. […] That's a very important part of the business. When I started General Transistor, I was speaking with the customers every month.

ULRYCH: That's interesting, […] because […] they filled one of your criteria in terms of their dedication and talent and drive. But there's one component missing, […which] is the ability to evaluate the marketplace.

FIALKOV: Right. […]These people never went out and talked to the potential customers, and found out maybe [they wanted] this and not that.

ULRYCH: So, that was a lesson learned for you after that. When you evaluated people, you looked at investment opportunities, and you also wanted to see that there were people there who […understood the] customer?

FIALKOV: You wanted to help them broaden their management group to be able to sell and market. [In an early stage, a company can't live without marketing and sales]. […We always] felt we could […] help them do it. […] That was a major job we had as board members. […] Not to control the company, but to help them succeed.

ULRYCH: […] If they didn't have the market savvy, then they had to be open to new ideas.

FIALKOV: Right. […But] these people were not [open to that]. They wanted to do what they knew how to do.

ULRYCH: That's a familiar thing, a familiar problem.

FIALKOV: And it was a shame to lose them.

BROCK: […] I've heard people mention that there's been a change in the practice of venture capital investing […] between what groups in […] the earlier period did and what groups [do now].

FIALKOV: The later groups [want] MBAs, and being the graduate at Wharton [School of the University of Pennsylvania] or […] whatever. [That assures] venture capitalist investors […]. These are not technical people, and the world is running on technology and you need people who understand it, understand something about the technology.

BROCK: This is on the side of the people choosing which investments to make.

FIALKOV: Right.

BROCK: The distinction that I've heard people talk about is between venture investors, who also bring to the firms that they're investing in…also bring these aides, if you will, as you were talking about, where they bring expertise through their board participation. But they also connect the firm they're investing in into networks that they have with other people, so they say, "Oh, here's a good marketing person. Here's a good salesperson. Here's a good lawyer." Has that changed over time? Do venture funds today contribute [that]?

FIALKOV: They're supposed to. Some of them do and some of them don't. Most of them have…most of the large venture funds have experience in raising money. Because what you have to do with these successful ventures is you constantly need financing to grow. So they became mostly Wall Street types, and those who also had tech…many venture funds have successful entrepreneurs involved in that.

BROCK: Yes.

FIALKOV: And those are the best bets.

BROCK: The best funds.

FIALKOV: Right.

BROCK: As a sort of a…just to…maybe a little bit of a sideline, but to follow up on a story that you pointed to, your investment in AMI, American Microsystems, and connected to this group…

FIALKOV: Right.

BROCK: …design group that you invested in. In the 1960s, was AMI one of the first…one of the first pure MOS integrated circuit companies?

FIALKOV: I think so.

BROCK: Do you recall around when your investment in them took place?

FIALKOV: Had to be after they sold their assets. It'd probably have to be somewhere in the mid 1960s.

BROCK: Which, I think, is just when that company started […].

FIALKOV: We invested in it as a startup.

BROCK: As a startup. […] Now, I've heard that…we're all familiar with how successful MOS integrated circuits have become in general, that they've become the dominant form of integrated circuit. But it's my understanding that in the middle 1960s, that bipolar integrated circuits were by far the more common form of integrated circuit.

FIALKOV: Right.

BROCK: […] There was a time in the mid 1960s where the primary customers for MOS integrated circuits were the government and operations organizations like the National Security Agency. […So I have] two questions. One: […] is that your experience or is that true? And two: was part of the proposition of American Microsystems that they were going to be selling to the government as their customer?

FIALKOV: I think their interest was in selling to the Japanese, not for…

BROCK: For calculators. Okay.

FIALKOV: Yeah. NMOS was limited until Standard Microsystems started making NMOS, and started licensing Intel and IBM and […] so on on their COPLAMOS process.[9] […] Our first product was a memory chip that was equivalent to four of Intel's in size. Unfortunately, we were an upstart company and people didn't want to bet on us. When […] they were told by Texas Instruments that they would have it in a year, they waited. They didn't want to bet on a startup company. So we never got into the memory business.

BROCK: This was the competition…that would have been the 4K DRAM generation…

[9] NMOS was also called COPLAMOS

FIALKOV: Yes.

BROCK: …where there was a lot of fierce competition?

FIALKOV: We were first to offer it, but [customers] were willing to wait for the promises from others with whom they had greater confidence.

BROCK: What […] happened to AMI, American Microsystems? Do you recall where…?

FIALKOV: I think they were taken over by the Japanese. […] I don't remember which one.

BROCK: Huh. Primarily for calculator…

FIALKOV: Yeah.

BROCK: […] Well, I wanted to ask you some questions about your investments in Teledyne, and just the initial vision for Teledyne, and then how Teledyne developed over time or…

FIALKOV: […] When we invested in it, [Teledyne] was an equipment company, really just selling to the government. I invested in it just because Arthur Rock was raising money for it. [The] investment was in my name, but I had a partner [who] was one of my buddies at General Transistor. We ultimately sold it then [and] made some money. But Arthur Rock's fund did very well in Teledyne.

BROCK: Did Arthur Rock's fund that you were invested in also…did it hold Teledyne for longer than you had as an individual?

FIALKOV: Yes.

BROCK: […] So, if that was seven years long, had Teledyne started on its famous strategy of becoming this conglomerate during the 1960s or was that…?

FIALKOV: I think later…

BROCK: …later on.

FIALKOV: Later.

BROCK: That was later on. Did you have any interaction at all with Henry Singleton or form any impressions of him?

FIALKOV: Not really. I met him.

BROCK: Yeah.

FIALKOV: His other partner, who ultimately went to University of Texas…I don't remember his name…

BROCK: I think it's something like George Kozmetsky or something…

FIALKOV: […] Yes, that's right, Kozmetsky. He's a bright fellow. But Henry Singleton was a successful person already.

BROCK: Oh, by the time of Teledyne?

FIALKOV: Yes. He had built up a company, the name of which I don't remember, and was going to do the same thing with Teledyne, selling government equipment…

BROCK: Right. […] Jay Last and Jean Hoerni were right there in the formation of Teledyne with their semiconductor part of it.

FIALKOV: Yes.

BROCK: […] Well, I guess you must then have…did you know Jay Last or Jean Hoerni?

FIALKOV: Of course.

BROCK: You knew them by that time…

FIALKOV: Yes.

BROCK: Through Arthur Rock.

FIALKOV: Right. We invested in Hoerni's first company after Teledyne. I'm trying to remember the name of that.

BROCK: Well, he did something, I think, after he left Amelco. He did something with Union Carbide [Corporation]. Then he did…

FIALKOV: He started Intersil. That's right. [Hoerni's company after Teledyne was Intersil]. I think they're both deceased by now.

BROCK: Jay Last is alive, but […] Jean Hoerni died. […] Did you invest in Intersil through Geiger & Fialkov?

FIALKOV: No. […] We didn't invest in it. […] By the time that came about, Geiger & Fialkov was not investing anymore. It had been fully invested, and we were waiting to liquidate.

BROCK: So, I guess […] your involvement with Teledyne sort of wrapped up by the time that Davis and Rock was finished.

FIALKOV: Yes.

BROCK: Now, […] if the first Davis and Rock was 1961, that would mean [it was] about the time that you started Geiger & Fialkov, they must have…

FIALKOV: Geiger & Fialkov was started in 1968. […] I started Geiger & Fialkov when Arthur Rock …when Davis and Rock was liquidating.

BROCK: Right. […] Did Davis and Rock start another? They had two funds or…

FIALKOV: They started a fund subsequent to that, but I was not involved in that.

BROCK: […] Was your participation in the first Davis and Rock the end of your investing with Arthur Rock? I mean, there's the Intel investment that you're making…

FIALKOV: He made that separately. Intel was in Geiger & Fialkov, but what was the next one he invested in that was a major success? He said he invested that, not part of a venture fund.

BROCK: In the 1960s.

FIALKOV: You caught me at an advanced age. My memory is not great. […] Scientific Data. […] Scientific Data was in Davis and Rock.

BROCK: Right.

FIALKOV: And that was sold to Xerox for about a billion dollars. […] So when he liquidated Davis and Rock, we got a lot of Xerox stock. That was probably one of the major […] winners in his fund, in the first Davis and Rock fund. As I said, a hundred thousand dollar investment turned into two million dollars.

BROCK: Then did you take your, sort of, proceeds from Davis and Rock and put that into Geiger & Fialkov?

FIALKOV: I invested a million dollars in my own Geiger & Fialkov fund, the Limited part. So…

BROCK: So […] Geiger & Fialkov in Intel was, in a way, a no-brainer. […] You had both the people and such a track record…

FIALKOV: Right.

BROCK: …and Arthur Rock championing it. I can see that would have been a pretty clear one to do.

FIALKOV: Yes. The computer company was run by Max Polefsky, who was also an investor in Geiger & Fialkov. So we know Max very well.

BROCK: Who were the other investors and how many investors were there in Geiger & Fialkov?

FIALKOV: I would imagine probably about twenty.

BROCK: Hmm. It's not enough so you can know each and every person.

FIALKOV: Yes.

BROCK: Were they mostly individuals or were there some institutions or…?

FIALKOV: The only institution that invested was Carl M. Loeb […], who invested individually. […Others were] individuals, investment bankers, people I knew who served on the board of General Instrument when I was on the board. A group of them, including the Canadian…can't get his name right away. I'm going to be eighty-eight next month and remembering is tough.

BROCK: But there was a clear…there was a group of Californians in the mix for Geiger & Fialkov.

FIALKOV: Yes.

BROCK: So, you had Max Polinski…[sic]

FIALKOV: Jay Last, Arthur Rock.

BROCK: […] Were there any others from that California group that you can recall?

FIALKOV: No. There was one from Texas. He had an Egyptian name […]. Phays Saraphem.

BROCK: Saraphem.

FIALKOV: He's still running a major…he put […] Rice University, into Geiger & Fialkov.

BROCK: Okay.

FIALKOV: And he was an investor as well.

BROCK: And he seems very tied in with Arthur Rock, also.

FIALKOV: Partners, practically.

BROCK: But based all that time in Texas…

FIALKOV: Yes. […] He was in oil. Married into a major oil family.

BROCK: […In regard to] Geiger & Fialkov, […] were the first years of the fund [focused on] figuring out which firms to invest in and then, the other half of it, train them.

FIALKOV: Helping them prosper and so on. […] We distributed a lot of Microsemi stock when we liquidated, and that company turned out very well.

BROCK: Was [your] investment that you made in this semiconductor equipment fir—I don't know how to pronounce it exactly—Xynetics […] through Geiger & Fialkov?

FIALKOV: Yes, and Arthur Rock was an investor in that as well. […] He was on the board; I was on the board.

BROCK: Where was that based?

FIALKOV: In California […], and they had two operations. One [was] making probe sticks. There are two public companies that ultimately…we sold them to, I think, United Technologies, who later spun them off into two companies, one in the probe business, and I can dig up the names.

BROCK: I think I have them. Electroglas…

FIALKOV: Electroglas was one.

BROCK: And Ultratech.

FIALKOV: And Ultratech. You have them.

BROCK: So, if Geiger & Fialkov ran from 1968 to […] 1975, this investment with Xynetics was toward the earlier part of that timeframe.

FIALKOV: Yes. Xynetics was run by somebody who had once worked for me, a fellow named Bert Cohen, and they were in the Los Angeles, [California], area. They were originally an automatic design company of semiconductor circuits and chips and really a drafting machine.

BROCK: It was a plotter […. Is] that what the "X-Y" is?

FIALKOV: Right, which had been done all by hand before then, and so that was their first major product. We followed that. And then they acquired these other companies, Ultratech and Electroglas, and were sold to General Signal….

BROCK: Right.

FIALKOV: And General Signal ultimately spun them off into two companies, which became public companies, and they're still in existence.

BROCK: So, […] before Xynetics was sold to General Signal, it had acquired Electroglas and Ultratech. […] What I couldn't figure out was there was a very important company […] in the semiconductor equipment field called GCA that made steppers, the lithography tools, […] and I believe that […] at some point, they became part of the whole mix, which was Xynetics and Electroglas and Ultratech.

FIALKOV: That was before my time.

BROCK: Or it may have been when they were with General Signal?

FIALKOV: Might have been.

ULRYCH: […] So, your investment in Xynetics was 1968, 1969? Something like that?

FIALKOV: It was very early […] in Geiger & Fialkov.

BROCK: Probably 1968.

FIALKOV: Yes. If any of you would like coffee or water or orange juice, just let me know.

BROCK: […] Should I turn this off for a moment…

FIALKOV: Sure…

BROCK: Yeah. Let me just turn these off for a second. Okay.

[END OF AUDIO, FILE 3.1]

BROCK: […] So, well, we were talking about Xynetics, and I was wondering about the portfolio of companies that you invested in with Geiger & Fialkov. I realized I didn't know about just how many there were in total…in the total number of firms that the fund invested in. Do you have that just on the order of magnitude? Ten, twenty…?

FIALKOV: Probably around twenty.

BROCK: Around twenty. And would you characterize them mostly as being in…all in the semiconductor area?

FIALKOV: All in technology.

BROCK: All in technology. What were some of the areas beyond semiconductors that you can recall?

FIALKOV: Well, I'll have to see if I can look it up someplace, because it's so far back. […] It's a lot of years.

BROCK: It is. […] Well then, on the other side, how many people were involved with the actual running of Geiger & Fialkov? Clearly, at least two. How many others were involved? Did you have a staff?

FIALKOV: We just had a young lady who did all the secretarial work. We didn't have a staff.

BROCK: […] Did you have […] lawyers or accountants that you needed to use?

FIALKOV: Sure, we had accountants and we had lawyers. […] I know who the lawyer was. I just went to his ninetieth birthday. And I know who…I think I know who the accountants were. No. We probably had one of the top accounting firms. We had to have an auditor.

BROCK: In New York did you use people in the city?

FIALKOV: Yes. [My] lawyer was in the city. The same lawyer we used for Standard Microsystems, a personal lawyer. And, as I said, I just went to his ninetieth birthday a few months ago.

BROCK: Let's see. So, in addition to Intel, AMI, the Standard Microsystems, Micro Semi, Xynetics, are there any other semiconductor-related investments from that first Geiger & Fialkov fund that come to mind as memorable in a way? Or were there other equipment investments that you made […]?

FIALKOV: We invested in Carmen Sapphire [Corporation] company, when sapphire was going to be used as a substrate for microcircuits. They were ultimately sold to […] Union Carbide, I think. Carmen was the entrepreneur, and we invested in them because I think the Strategic Defense Initiative was going to use sapphire for the […] substrate [for lasers] because of its radiation. […] So, that was one. That was on the West Coast. And we ultimately sold that to Union Carbide, because a major market hadn't developed for it. We were happy to sell it. Was there any other semiconductor? Probably. I'll look it up. I'm sure I have it someplace.

BROCK: When we reach 1975, […] did your stake in Xynetics sort of end after the […] closure? **[…]** Did you hold onto its stock […]?

FIALKOV: […Xynetics] was sold to General Signal.

BROCK: Right. So after Geiger & Fialkov closed, did you hold onto the stock in Xynetics?

FIALKOV: No. No, I think it was sold before we closed. […] As a matter of fact, it was a funny incident. It was a British company who was interested in buying Xynetics (I don't remember the name of the company). But we were going…I was on my way, traveling first class as I remember, and there was a gentleman sitting next to me. He was busy working, had practically no conversation with him. When I got to the board meeting, he was there. He was the fellow from the British company who was [interested in] buying us. [laughter] But, ultimately, we didn't sell to him. He had actually put in a major deposit in order to join us at the board meeting and make his pitch. I don't remember the name of the company, but it was very interesting. We had sat there the entire trip from New York flying to California, and there he was as our guest.

BROCK: […] In 1975, when Geiger & Fialkov was winding down, […] were you still excited about venture investing, because it seems like you went straight back into it after that fund closed?

FIALKOV: Yes. We started a personal investment firm, called Aleph Null Corporation, which is a mathematical symbol used in infinity mathematics. They ran out of Greek letters and they started using a Hebrew letter. […] I formed a company called Aleph Null, and we kept making startup investments with just a personal family company where I [own] the preferred stock and my children own the common stock. I wanted them to get the gains, and that worked out very well. We invested a lot of money in Micro Semi. And [another company] we invested in […] was called Radyne, which was in telecommunications. I'm trying to remember names of companies we invested in. I don't think we invested in semiconductors. […] We were investing in startups. When I had the opportunity with a partner to form PolyVentures, I gave that up. I liquidated that.

ULRYCH: Now, when did […] you actually start this Aleph Null, what was the year? […] Nineteen seventy-five, 1976, something like that?

FIALKOV: Soon as we finished with Geiger & Fialkov. This was a Long Island-based company with an office very close to home. I became involved in the technology [that] was going on in Long Island. And we started a Long Island venture group that met every month, where people made presentations and we pitched…put them together with investors. It lasted a few years, and the major thing my children got out of it was a lot of Micro Semi stock.

ULRYCH: And then you started PolyVentures. Would that be around 1983 or so? Nineteen eighty-two?.

FIALKOV: […] I don't know.

BROCK: […] While you were doing Aleph Null, were you also participating in other people's venture…

FIALKOV: Yes.

BROCK: …partnerships?

FIALKOV: Yes. […] There were other venture capitalists on Long Island that we co-invested in some. They're all little technology.

BROCK: […] What about participating in West Coast venture capital funds? Did you do any of that?

FIALKOV: No. No.

BROCK: […] Around 1975, when you were deciding to set up this private investment operation, did you debate whether or not to do another venture capital partnership on your own, or did you feel you had had…?

FIALKOV: I didn't. It turned out that Shelly [Sheldon] Harrison, who was an alumnus of Polytechnic University…I was involved with Polytechnic University because they used to be Brooklyn Polytechnic. They'd acquired the Engineering School of NYU from which I graduated. I went with the merger, and I joined the board of the Polytechnic University. I served on their board for about twenty years. And I met Shelley Harrison, who was interested in doing something in the venture field. He was a fellow who had been a successful entrepreneur with a company that made the things you scan in the supermarket.

BROCK: […] Bar code scanner things.

FIALKOV: […] Yes.

BROCK: Was that called Symbol Technologies?

FIALKOV: Symbol Technology. He was the founder of Symbol Technology with another partner called Jerome Schwartz. […] They separated and Harrison left, and he was interested in getting into venture capital. He spoke to me, and we spoke to the people at Polytechnic University from which I was an alumnus […].

So, we started PolyVentures and Polytechnic University made a couple million dollars out of that, so it was okay. A semiconductor company we invested in was DSP Circuits when that was a startup. DSP Group, and DSP Communications, when it spun off, we invested in it. I was on the board of DSP Group. I was on the Board of OPAL, which made semiconductor equipment.

ULRYCH: If we could just […stop] for a second, I'm just a curious about this, because you mentioned this Long Island venture group.

FIALKOV: Yes.

ULRYCH: I'm just curious…did the background of the people who participated in that, they were all living in Long Island, […] were they […all] from a similar background, from Brooklyn, or was their background much more diverse…?

FIALKOV: Much more diverse.

ULRYCH: Okay.

FIALKOV: Much more diverse.

ULRYCH: […] Because I can say […] we've found a lot of people who have this very similar background to yours in terms of families immigrated from eastern Europe coming to live in Brooklyn, going to Brooklyn Polytechnic and NYU Engineering, and going on to successful careers in venture capital and innovation firms

FIALKOV: Yes.

ULRYCH: And I'm just curious whether that was something else that united these people in Long Island?

BROCK: Was there a particular type of technology that was popular on Long Island in this period? Was there a dominant technology industry?

FIALKOV: The dominant companies in Long Island prior to that time were the aircraft companies, Fairchild and Republic…what's the big one that's still there? [Northrop] Grumman [Corporation]. So, there was a lot of technology, but there were just a few semiconductors, small companies that were formed by people who used to work for my company. There's still some alive doing mostly diodes and power semiconductors. It's still alive there, down there.

BROCK: Was there any life sciences or biomedical stuff going on?

FIALKOV: […] There were quite a few of them, but we steered clear of them [because we had no technological knowledge to be able to help those companies].

ULRYCH: That's interesting, because […] the biology and chemistry departments at Columbia did develop some people in that area.

BROCK: Shelley Harrison, […] did he have a business background or a laser background? Was he a technologist?

FIALKOV: He's a technologist. He's a Ph.D. He had worked at Bell Labs, and he, as far as I know, has been doing personal venture capital investments through a family company ever since PolyVentures stopped—he and his wife, Suzanne. They were both partners in PolyVentures.

BROCK: […] Symbol Technology has certainly grown to be, I think, the dominant thing.

FIALKOV: Dominant in their field.

BROCK: Is he still involved with it?

FIALKOV: No.

ULRYCH: […] Do you remember the field […] where he had his Ph.D.? Was it electrical engineering or…?

FIALKOV: It wasn't electrical.

BROCK: I think something related to laser […].

ULRYCH: Yeah. Well, I was curious also whether it could be material science or something like that.

FIALKOV: I don't remember.

BROCK: That should be easy enough to find out…

ULRYCH: Yeah, it would be interesting. It's one more person with the Bell Labs connection, too.

BROCK: The DSP Group, that's for "digital signal processing" or something?

FIALKOV: Yes. It was the beginning of digital signal processing.

BROCK: Which has become important for all communications really.

FIALKOV: Yes. Texas Instruments: major company in semiconductors for that. But it turned into two successful companies: DSP Group and DSP Communications.

BROCK: […] Did it have its origins in Brooklyn Poly.

FIALKOV: No.

BROCK: No?

FIALKOV: The arrangement with Brooklyn Poly really didn't produce anything which we had hoped.

BROCK: In terms of investing in developments that they had made there?

FIALKOV: This group was an Israeli group, the DSP Group. We had board meetings in Israel. We had board meetings in New York mostly. Then it formed a subsidiary called DSP Communications, and that became a public company and ultimately it was sold to Intel.

BROCK: A U.S. subsidiary?

FIALKOV: Yes.

BROCK: Was…I guess, so by that time, when you would have been making that investment, there was…I'm trying to remember the timing of…Intel made a big move to build…to start to design groups and to establish semiconductor fabs in Israel. And I'm trying to remember when they did that, if it was before…

FIALKOV: Intel did. National Semiconductor did.

BROCK: Was that before the DSP Group sequence? Was Intel already there? I can't remember.

FIALKOV: […] I don't know either, but the DSP Group came to us with their ideas and we liked [them] and we invested. The fellow who ran it is, kind of, a strange duck, and my partner, Bob Brill, who […] started on their board, asked me to take over the board position because he couldn't get along with the guy. And I got along with him, and it was very successful. We invested in OPAL which was another Israeli company which made […] measuring equipment.

BROCK: For testing the wafers, etc.?

FIALKOV: Yeah.

BROCK: Or, what did they call that? Semiconductor metrology or something.

FIALKOV: That's what it was.

BROCK: Okay. So, yeah, well, that's very interesting because this was a very, very important time for the growth of semiconductor industry in Israel.

FIALKOV: Notwithstanding my connection with the Weizmann name, [laughter] in 1968 I became involved in the Technion University. […] I'm still involved as a Regent of the American Technion Society. At the beginning, I was on the board. I was on the board of the university in Israel. […] We had some connections [to] the technology coming from Israel. So

we invested in a few things in Israel. Another company we invested in—and I'm trying to remember the name—ultimately sold. I'll find it.

BROCK: Now, the Technion was the major, sort of, science and engineering institution in the country. When was it founded? I guess it was founded much earlier than your involvement.

FIALKOV: […] Oh, sure.

[Fialkov leaves the room]

ULRYCH: I'm just curious […] how Herman got to be on the board of…

BROCK: Oh, we should ask him that.

ULRYCH: Yeah. That is interesting, I mean because it's kind of far away. That becomes another interesting thing, because of […] Jerry [M] Sudarsky, when […] he founded the Israeli Chemical Company […]. He got plopped in 1967 to create that.

BROCK: Hmm. I think I'll stop this until he gets back.

[END OF AUDIO, FILE 3.2]

FIALKOV: I'll just tell you that at the beginning.

ULRYCH: That's a nice book.

FIALKOV: I think probably […in actuality], Weizmann was involved in the founding.

BROCK: Great.

ULRYCH: How is that you got to be involved in it?

FIALKOV: I got involved in that because, in 1968, when I left General Instrument, I made an investment in a very successful company in Long Island that made radiators and ultimately started making boilers. I knew this fellow, and I invested in his company and he provided me with an office in this plant, in this operation on Long Island. He was involved with Technion and he introduced me to it. […]As part of the introduction, I went to Israel with a group of people who were newly involved and we met some of the top Israeli people, including that fellow with the patch over his eye.

ULRYCH: Oh, Moshe Dayan?

FIALKOV: Moshe Dayan. And the President of Israel. I still have my picture with him.

ULRYCH: And they talked you into it.

FIALKOV: I became a founder, but that had to do with how much money you gave them, [laughter], not with having been involved in the founding, which apparently started at the turn of the century.

ULRYCH: Much earlier…right.

FIALKOV: Can't find the exact date, but apparently they were involved and it was [Theodor] Herzl and Weizmann around the turn of the century.[10]

BROCK: Wow.

ULRYCH: […It] wasn't named Technion at that time. It had probably a different name [the *Technikum*] and then eventually evolved into that.

FIALKOV: […It wasn't] Technion right away.

ULRYCH: No.

[10] The Technion was founded in 1912.

FIALKOV: At any rate, [I] became involved. And […] I went to their meetings in New York and occasionally in Israel and got to know some technical people, and a lawyer in particular, who helped us find investment opportunities.

BROCK: Did you get to know a man—Dov Frohman—who was very big in semiconductors? I think at this time he was heavily involved with Intel's Israel operations.

FIALKOV: No idea. Actually, Technion had very little to do with semiconductors in 1968, when I became involved with them.

BROCK: Yes. That was, I think, before Frohman really got his operation going there. That was more into the mid 1970s, I think. So, that was the start of your investment career in Israel. I was wondering if you look back and compare your experience of […] investing in the U.S. on the West Coast, on the East Coast, on Long Island, [and] Israel, are there geographic differences to investing, or the business environments, in these different geographical locations?

FIALKOV: You're investing in people. It doesn't matter where.

ULRYCH: Where they are.

FIALKOV: […] If you're investing in people, it doesn't matter…

BROCK: Then geography [doesn't] matter?

FIALKOV: Geography matters to a certain extent. You have to be able to interact with these people, often, in order to help them. I used to fly to California every month. The Israeli people usually came here when they're looking for help, because this is a major market. So, they usually had an office here. It wasn't difficult.

BROCK: Was the DSP Group a spinout from Technion? […] What were their origins?

FIALKOV: I don't know. I didn't learn about it from Technion. I learned about it probably from another venture fund [that] didn't have semiconductor experience, so they sent them to me.

BROCK: Was that something that happened with some regularity, that venture funds were known to […] specialize and you could refer to others…?

FIALKOV: We learned about OPAL from a venture fund in Boston, [Massachusetts]—I'm trying to remember which one, but I don't—and they just didn't have this kind of experience, and they were looking for a second round of financing and they didn't feel they knew enough about it. So, they wanted us involved.

BROCK: So, there were…you would have a respected group of investment colleagues who you could refer people to if they were, kind of, out of scope for what you were.

FIALKOV: Yes. And we invested in Philadelphia, [Pennsylvania], and Conshohocken, [Pennsylvania] [laughter].

ULRYCH: Which company was that […]?

FIALKOV: I don't remember the name. But I used to go there often.

ULRYCH: What were they doing?

FIALKOV: I don't even remember that.

ULRYCH: But you remember Conshohocken.

FIALKOV: I remember Conshohocken, because I know it well. I used to travel by train and it was right near the station in Conshohocken…

ULRYCH: Okay. I'm curious what it was, but there's been a lot of change.

FIALKOV: Yes. […] And of course I was involved in the purchase of Jerrold, which was not in Philadelphia, but it was not far. Did I tell you that story?

BROCK: […] This was the…your big cable television…

FIALKOV: Right, yeah. […] I felt that cable television was a coming thing. At that time, it wasn't even called cable television and it was used for getting to people in remote areas. And I found a company in New Jersey and I went to my chief executive at General Instrument and said, "I want to buy this company in New Jersey." They're in this…I'm trying to remember what it was called then. And he said, "Which is the biggest company in the field?" I said, "Jerrold." He said, "Buy Jerrold." And I did.

BROCK: Community access television, CAT TV, is that…

FIALKOV: Something like community. Community was in it. […]The fellow [who] started it ultimately became governor of Pennsylvania…Shapp—Milton [Jerrold] Shapp.

ULRYCH: Oh, wow, Milton Shapp. Okay. That puts it into…in perspective for me. I remember Milton Shapp; nineteen sixty, I think, he became governor or something like that or 1964.

FIALKOV: Yes. When we bought it, he was out of the company by then. We bought it probably around 1966 or 1967 and that became the major earner of General Instrument. And we sold it to Motorola for about seventeen billion dollars.

BROCK: […] And that's still a primary thing for Motorola today, right, these […] cable boxes. Was that part of the business when you acquired it, too, both the service and the equipment?

FIALKOV: They had both. They had…and a very large [membership]. I don't know if it was a million or so […] participants. Community access television, something like that…

BROCK: Yeah…

ULRYCH: […] And out of that came Suburban Cable, Bucks County Cable, and eventually Comcast, because Comcast bought up all of those.

BROCK: Yeah. That's what I was wondering. […] It is interesting that there is this, sort of, Pennsylvania…. You had some very big cable television companies in Pennsylvania, and it probably relates to this history.

FIALKOV: […] Pennsylvania had Philco in Lansdale, [Pennsylvania].

ULRYCH: Right.

FIALKOV: We…at General Transistor, we were a licensee of Philco, and we […] bought their equipment, and had a line making these fast switching transistors.

ULRYCH: The demise of Philco is an interesting story.

FIALKOV: Yeah. It became Philco Ford. […] Bob Noyce came from there.

ULRYCH: Yes.

BROCK: […] When you were doing General Transistor, was there still mainframe computer system manufacture going on in Philadelphia? Because several of those outfits…I think they all started there.

FIALKOV: They may have started there, but Remington Rand UNIVAC wound up in the Minnesota-St. Paul area. And Control Data was in St. Paul.

BROCK: Right. […] They moved out of Philadelphia.

FIALKOV: I used to fly to Minneapolis-St. Paul like once a month to sell them transistors, and tell them how to switch from tubes to transistors.

BROCK: [Did] Engineering Research Associates […] become part of either Control Data or UNIVAC at the time? I can't recall.

FIALKOV: […] I did 50 percent of my business with them, and Control Data. And ultimately, when I started General Transistors, the major users of transistors were hearing aid manufacturers all grouped around Minneapolis-St. Paul area.

ULRYCH: That's right. That came out earlier, which I also found kind of interesting.

BROCK: Well, maybe we could switch gears one more time and talk about some of your more recent investments. One that I personally found to be very intriguing, when I started looking into it, researching it a bit, was this Integrated Environmental Technologies…

FIALKOV: Yeah. The name has been changed to InEnTec.

BROCK: InEnTec.

FIALKOV: And InEnTec has a subsidiary called InEnTec Chemical.

BROCK: […] I thought that…well, perhaps you could just, if you wouldn't mind, tell us the story about how that […] activity started and how you got involved and what's happened?

FIALKOV: Oh, it started about twelve years ago with one of my entrepreneurial friends who became an investor in Integrated Environmental Technologies. [His name is] Larry Dinkin. He was a successful entrepreneur in the frozen food business, and he retired with a lot of money. He invested a lot of money in this Integrated Environmental Technologies, and I invested in it about twelve years ago. They've been losing money ever since. But supported by him and another fellow, [a] fellow named [E.] Gary Cook, who comes from the chemical field. I don't know if you've looked up InEnTec and…

BROCK: […] I didn't see the investors.

FIALKOV: Yeah. If you go to InEnTec.com and look at the background of the […] guys who are running it…. […] There's a lot of stuff you can get on their [website]. I'm happy it's Saturday and not Friday, because we had an important telephonic board meeting starting at 11:00 a.m. yesterday.

BROCK: […] For InEnTec?

FIALKOV: For InEnTec.

BROCK: So, you are a member of its board of directors?

FIALKOV: Yes, for twelve years. The only board I'm still on. It's really called a Management Committee, because it's an LLC. That gives us a tax advantage of being investors. But I should have some stuff on it.

ULRYCH: I'm just curious. When you decided to invest in InEnTec, you had a friend who was already investing and you had trust in his judgment.

FIALKOV: Yes. […] He was more than a friend. He was a son of close friends of mine. I've known him since he was a young fellow, and I sort of mentored him when he went into business, and, ah, he still sends me emails asking me what to do here, what to do there.

ULRYCH: So, okay. Because I was curious whether the technology also intrigued you?

FIALKOV: But if you go on, on InEnTec Chemical, you get a lot of information.

BROCK: Let me just pause this for a…

[END OF AUDIO, FILE 3.3]

BROCK: Great. So, I think…

FIALKOV: You still want some more coffee? I'll…

ULRYCH: Oh, I'm fine. I still have a little bit here.

BROCK: Yeah, me too. Were you just asking a question…?

ULRYCH: Well, I was just curious whether Herman was intrigued by the technology […]?

FIALKOV: I like the idea of the technology, because I thought, "If this is successful, it should be all over the world." They've got a plant in Taiwan that's doing well, a plant in Japan that's doing well. […] Capital equipment to…the project with Dow Corning requires a twenty-five million dollar…

ULRYCH: Additional?

FIALKOV: And trying to get money into capital equipment companies is very difficult.

BROCK: […] I understood that you invested in people, because that…that's what always attracted you. But I'm curious how many times you may have felt that what you were doing was socially beneficial or did you feel that any technology is socially beneficial?

FIALKOV: Any is, but this one is particularly. […] They have a deal with […] Waste Management. And they're building a pilot plant, after which its success will engender building many, many more, because Waste Management is a huge company—[…] the largest company handling garbage in the United States. And turning garbage into energy sounds great. Your raw materials cost you only transportation and people are just happy to get rid of it. They can also handle hazardous stuff, which is very good for chemical manufacturers because they have a lot of hazardous refuse. And if you could have a local plant that you don't have to transport it, and convert it into energy, well, that's great. That's what they're doing with Dow Corning in Texas. So, it's really a turning point for the company. They've got people who are financing twenty-five million dollars, and Waste Management […] has put in a great deal of money in order to get this thing going, because if this thing goes, it makes all others obsolete. […] And it's nontoxic.

ULRYCH: Right. Waste Management has trouble finding places to put the garbage anymore […].

FIALKOV: Yes. The incinerators are taboo because of dioxin, and so forth. So, some people are using wood chips, but this company has the technology and the patents. If these several projects on the board, underway this year, succeed, it'd be a large leap forward.

BROCK: One thing that I thought was interesting that I saw—I don't know if it still holds—but it looked to me that one of the strategies was that InEnTec or InEnTec Chemical would own and operate their plants […] under contract with towns or companies…

FIALKOV: And get paid with the contract money, because of the throughput fees.

BROCK: …and the throughput fee would be just a charge for what's coming into it […].

FIALKOV: No. You would get a constant charge as long as it was running.

ULRYCH: In other words, you're taking […a fee for operating the plant] and generating energy.

FIALKOV: This can be…we've got some major chemical people […]. If you go to InEnTec.com and look at the biographies of the fellows who are running it, […] a fellow named Gary Cook, who was head of a major chemical company, and they have people on their board who were major executives at DuPont—so heavy chemical stuff. […] There's a lot of information on InEnTec: www.Inentec.com and www.Inentecchemical.com.

BROCK: Right. I looked at both of those, and that's where I saw this strategy of, rather than sort of selling a company equipment they could install at their plant, if you will…

FIALKOV: […] Getting throughput fees.

BROCK: The ideas that […] the company would, sort of, co-locate their to run the thing.

FIALKOV: Well, you have to have our technical people there supervising the running, and so on. […] The advantage is you can get hydrogen out of it. If fuel sales take off, for instance, you could get any kind of […] hydrocarbons that have sales value—methane, ethane. You can tailor this to get energy, any kind of energy, or just electrical energy.

BROCK: By burning what's coming out.

FIALKOV: Yes. […] The right thing for this country to do would be to invest billions of dollars into this technology, instead of coming up with an idea to create jobs by building another nuclear plant.

BROCK: […] One of the byproducts, too, is, sort of, this glassy material, isn't it […]?

FIALKOV: Yes. It's usable because you can build things with it. […] It's certainly clean. You're not […] creating landfills that stink.

BROCK: And you can also recover metals from the process. Is that true?

FIALKOV: Yes.

ULRYCH: So, this glass materials that's developed or created, what are the applications […]?

FIALKOV: You can build things with it.

ULRYCH: You mean houses?

FIALKOV: Yes.

ULRYCH: And you mentioned highways…I mean, asphalt. […] It could be an additive to construction materials

FIALKOV: They'll find lots of uses for them.

BROCK: […] Did the technology originate for handling very hazardous materials?

FIALKOV: Yes. It originated at MIT [Massachusetts Institute of Technology], and at…what's the place in Washington…

BROCK: […] Washington, D.C.?

FIALKOV: No, Washington State. Big lab…

BROCK: Government lab in Washington State, I don't know. I can look it up. […] Was that for dealing with things like radioactive waste, if…

FIALKOV: Yes.

BROCK: Like for Hanford [Site] and things…this clean up thing…

FIALKOV: It can…and the radioactive waste.

BROCK: […] Because it can separate out […] the metals, I suppose.

ULRYCH: Well, that actually, tunes into the whole problem of nuclear power…

FIALKOV: Yeah, but their major concern now is that chemical factories are potential customers, and turning garbage into energy.

BROCK: […] That's municipal solid waste—MSW, okay. […] Has this given you any other thoughts […] in terms of investing [..] in to green tech or clean energy or these sorts of areas? Do you see this as an important area for venture investing today?

FIALKOV: Well, that's why some venture people are investing in the idea of using biomass, right, but you have to pay for biomass. I think all this business with creating ethanol from corn is stupid. It just doesn't make sense. It's doubled the price of corn, ridiculous. […] Where garbage is, you are happy to get rid of it. So, the major thing I see is the deal with Waste Management. But Waste Management is investing in the burning biomass also. […] They're trying everything. But it's very interesting. Something kept me going. When I […] started resigning from boards—I resigned from eight commercial boards and three nonprofit boards—I sent [each of] them a little song [by Pete Seeger][11] that said I've run out of get-up-and-go […].

[11] Pete Seeger, *Get up and Go*, 1960

BROCK: Well that concludes the question list that I've prepared for today […].

FIALKOV: I'll look up some of the answers to what we left unanswered.

BROCK: Great. I […] personally found that integrated InEnTec story to be quite interesting, and also, it seems it's a combination of two technologies.

FIALKOV: […] Creating energy out of it.

BROCK: Yeah. That's the key concept.

FIALKOV: That's a wonderful thing and should be…I can visualize this going all over the world, but starting twenty-five million dollar plants here and there is not easy.

BROCK: It requires…it's a very real investment puzzle.

FIALKOV: It requires the government to really get involved in a big way.

ULRYCH: If you have…obviously, you've been approaching government and trying to develop a kind of following.

FIALKOV: It's hard, quite hard, right now. […] The government is all screwed up.

BROCK: […] Would it require legislation do you think? Is that the sort of interest from the government or investment in the technology? Or what would you like to see government doing?

FIALKOV: I'd like to see them putting up the money to build up these plants all over.

BROCK: Providing loan guarantees […]?

FIALKOV: There's some that are being used to [handle] medical waste, just get rid of hazardous waste […].

[END OF AUDIO, FILE 3.4]

[END OF INTERVIEW]

INTERVIEWEE: **Herman Fialkov**

INTERVIEWER: **David C. Brock And Richard Ulrych**

LOCATION: **The Yale Club**
New York City, New York

DATE: **28 June 2010**

BROCK: […] As we were discussing before, I thought today […] we could discuss […] some of […] the firms that you were involved with through your […] various venture capital endeavors, starting in the late 1960s. Mainly, out of that packet of documents you sent. […] What I tried to do in reviewing those documents was to […] get a grouping of these firms in a roughly chronological order. My thought was that we could just […] go through the names of these firms, and just talk about your major recollections of them, and your involvement with them, how things turned out for them—the story of each of these firms, if you will.

One that I saw in the first group, which I guess is the Geiger & Fialkov Group, was a company called SignaLight from New Jersey. I was wondering if you could tell us whatever you might remember about that firm.

FIALKOV: SignaLight was not a venture type of a thing. It was a company that I acquired for General Instruments when I was the senior vice president for making acquisitions. And SignaLight was a company that manufactured […] neon bulbs. They were making money. They were in the [western part] of New Jersey…[I'm] trying to remember the town. […] It was not a major acquisition, I think; we acquired it for a couple of million dollars. […] After I was out of semiconductors and just making acquisitions for the company. It was a small acquisition. It [stayed] small, never grew into anything large. What I remember most about SignaLight is that the fellow who was a partner with that—50 percent of what we paid—ultimately continued to work for the company, and, ultimately, gambled his money away. One Sunday morning, he sat down on the piano bench and shot himself in the head.

BROCK: Oh, my gosh, after losing everything to gambling.

FIALKOV: After losing everything gambling. […] At that time in New Jersey, there was a meeting of a group of neurosurgeons at the local hospital. They operated on him and they saved him.

BROCK: Oh, my gosh.

ULRYCH: What was he like after that?

FIALKOV: After that, Monty Shapiro, who was the chief executive, talked to his debtors. But […] he got him off the debt and the fellow became an investor in Geiger & Fialkov.

ULRYCH: […] Not only did he live, but he didn't lose mental faculties or anything like that, of any substantial way?

FIALKOV: That's right.

BROCK: That's amazing.

FIALKOV: It must have gone this way, and whatever was damaged [recovered somehow…].

BROCK: One of the other firms that I saw listed, or that I saw on the documentation that seemed like a very different sort of a thing, was something called Electronic Wholesalers that was run out of Miami, Florida.

FIALKOV: It was one of the first investments that Geiger & Fialkov made. It was [a] very successful, southeastern wholesaler of electronic products. We [ultimately changed the name] to Agora Industries because we wanted to make acquisitions and become public. I became chairman, but we ultimately sold it to Cramer Electronics […], which was in New England…a major New England distributor. There's a similar story there because the top executives of the company, including the fellow who ran Electronic Wholesalers, were meeting in a hotel in Rye, New York. The hotel caught fire, and the fellow from Electronic Wholesalers was killed—another crazy story. But it was a major fire. Cramer Electronics was ultimately sold to Arrow.

BROCK: To whom?

FIALKOV: Arrow Electronics…

BROCK: Oh, to Arrow Electronics. I'm familiar with them.

FIALKOV: …which was a major company. But this was in the business of distributing components, including semiconductors, which brought me to Electronic Wholesalers in the first place.

BROCK: Had they been a distributor in your parts?

FIALKOV: I don't remember. […But] I was familiar with what they were doing. I liked it, and I thought it would be an interesting investment, and that's how it turned out. […] I probably still have a stock certificate of Electronic Wholesalers made out to Geiger& Fialkov someplace in my historic stock certificates. But it was […] left over, and never exchanged. […] By the time the merger took place, there was no Geiger & Fialkov—we'd already distributed everything. Two strange stories.

BROCK: […] Yeah. That's funny, that I picked those two at random to begin with. […] When you changed it from Electronic Wholesalers to Agora Industries in order to make acquisitions, [were you] buying up other component distributors?

FIALKOV: We thought that once we were a public company, we could enlarge it […]. It turned out that we got involved in different ventures, and we let that be sold to Cramer. It was a good, […] profitable sale.

BROCK: And Cramer itself was an electronics components distributor?

FIALKOV: Successful.

BROCK: Yeah. […] Well, similarly named, I saw that there was a company called Pharmaceutical Wholesalers that was based in Long Island. What was that?

FIALKOV: […] Pharmaceutical Wholesalers was a fellow who had a business selling pharmaceuticals—generic pharmaceuticals. […] He didn't manufacture them; he sold them. Some of them were the pharmaceuticals that required […] prescriptions for sale. They got into some sort of […] legal trouble. I really don't remember what happened to them. […] I don't remember that it turned out to be a successful venture.

ULRYCH: What led you to make that investment […]?

FIALKOV: We were already invested in distributors. This was a local one and they were profitable…

ULRYCH: At that time.

FIALKOV: And we thought generic pharmaceuticals would go a long way, and it did. […] The major company is an Israeli company called Teva [Pharmaceuticals Industries, Ltd.]

ULRYCH: Right, today.

FIALKOV: Today. But we recognized that it had a major future potential, and we thought "Let's get involved."

ULRYCH: Only this guy didn't turn out to be the right one.

FIALKOV: It didn't turn out to be the right one. He was sued by a competitor and it turns out that he was selling some of these pharmaceuticals without the proper […] authorization

ULRYCH: What years were those? […] What timeframe was that?

FIALKOV: If it was Geiger & Fialkov, it was somewhere between 1968 and 1978.

ULRYCH: That's really before Hatch-Waxman, 1984.[12] That's when the generic drug industry really took off after 1984 […].

FIALKOV: We [tried] to get in early […], but got in with a fellow who wasn't doing everything on the dotted line. […] He had to check […] that he was selling it only to a pharmacist.

[12] Drug Price Competition and Patent Term Restoration Act of 1984, *Public Law 98-417*, 98th Congress (S 1538), 24 September 1984.

BROCK: Oh.

FIALKOV: And he wasn't that careful.

BROCK: Another company that I saw that was also based on Long Island was called Lisa Monet Incorporated. I couldn't find anything out about that firm. […] I believe you were on its board of directors. I assumed you had been invited to participate. It was from the Geiger & Fialkov era.

FIALKOV: What did they do?

BROCK: I couldn't figure it out. […] It eluded me in my research.

FIALKOV: It was one of the things I resigned from.

BROCK: It was indeed.

ULRYCH: It's a curious name.

BROCK: Also based in Plainview, [New York].

FIALKOV: Plainview. I'm drawing a blank.

BROCK: A firm that was perhaps related to Agora Industries that I saw, that was based in Miami, Florida, was called 21st Century Electronics.

FIALKOV: 21st Century Electronics is a subsidiary of Electronic Wholesalers. I think it was just one of their locations.

BROCK: […] A company called Slant/Fin Corporation from Greenvale, New York. […It] seemed to be more in the industrial line of things.

FIALKOV: Slant/Fin was a personal investment. When I left General Instruments, Slant/Fin was a company whose major product line was radiators for the home—baseboard radiators. They also made boilers. They added boilers. It was a very successful company. I invested in it. I took a personal, substantial position in it. […] This is before I went into venture capital. When I left General Instruments, he provided me with an office. […] This was a fellow I played tennis with and a neighbor. Fellow named Dubin.

ULRYCH: That's how you came to make this investment? You knew the man; you played tennis with him […].

FIALKOV: […] It was a great location to be. He had a great location near where I lived. I don't remember the exact town. I could look it up, because it's still there. It's still very successful. But when I went into venture capital, I sold my shares back to the company, broke even. It was an investment that we talked about. I would ultimately become a 50 percent owner because it was a private company. He, ultimately, went public and made investments in other fields, particularly one that I also invested in, which manufactured pharmaceuticals or researched pharmaceuticals. It was many years ago, and they never had any pharmaceutical […] success. However, […] they kept raising money, and they're still raising some money at higher prices. They've got one that's pretty close to success. I donated all my shares to the North Shore University Hospital. I took the tax benefit. The shares are selling at higher prices now. […] They still haven't completed a drug, but they have a drug. I don't know if I saved their letters. They still send me the letters. They may hit it.

ULRYCH: What's the name of the company?

FIALKOV: The name of the company is Slant/Fin. What's the name of the […] pharmaceutical…didn't I give you that name?

BROCK: The name may be in here, but its relations to Slant/Fin may be obscure […].

ULRYCH: I just find it interesting that […] there are two pharmaceuticals that we could see. Now, you mentioned a third one…

FIALKOV: No, this was different. This was a research company. But the research was being done in Israel […].

ULRYCH: […Israeli Pharmaceuticals]. Is that the name of the company?

FIALKOV: It might be.

BROCK: That was one that we found documentation about.

ULRYCH: Yeah. Oh, okay. So, that's interesting.

FIALKOV: I don't think that's the same company. But I'll get you the name.

ULRYCH: Okay. I was just curious that you would get into that, because you don't…

FIALKOV: He got into it. Dubin did.

ULRYCH: And he talked you into it?

FIALKOV: He was raising money for this Israeli company. He did a lot of that sort of thing and I joined him. I didn't make any further investments in the company, because it was out of my purview. […] But many people did. But it's been a very long time…

ULRYCH: Without a return.

FIALKOV: …without a return. I got the tax benefit of making an eighty thousand dollar gift to the hospital and I was happy. The hospital was happy. He's still sending me stockholder reports. Maybe they never put [the hospital] on the stockholder list, I don't know. [laughter] But I have the name, because I saved some of those reports.

BROCK: One firm that we saw in the documents that was from this Geiger & Fialkov era on the West Coast that we haven't talked about before was something called Carmen Sapphire Corporation.

FIALKOV: Carmen's Sapphire…the name of the founder was Carmen. First name was…I don't remember. At that time, I think, [Ronald W.] Reagan was President and he had a strategic defense initiative that required semiconductors built on sapphire.

BROCK: Is that […] to get rid of the heat or something, or…?

FIALKOV: It's the radiation protection. I think today it is a substantial business of semiconductors on sapphires. But, Sapphire Corporation was ultimately sold to Union Carbide. I think it was okay as a venture, but it needed a larger company to…

BROCK: Was that in southern California?

FIALKOV: Yes.

BROCK: And […] that company had the technology for making synthetic sapphire…?

FIALKOV: […] Building sapphire crystals.

BROCK: Interesting. […] Do you recall if it was a similar to the process for growing crystals of semiconductor materials or was it a special…?

FIALKOV: […] To grow single crystals of sapphire […] was a unique ability. There weren't too many companies doing it and we anticipated a huge demand, but that strategic defense initiative ultimately disappeared. There was no market…no major market for sapphires when it was sold to Union Carbide. But they felt that it had a future and they bought it.

BROCK: Right.

FIALKOV: Carbide, of course, ran into some major problems in India.

BROCK: Yes.

ULRYCH: […] It's interesting because Kyocera make these artificial—synthetic—sapphires and precious stones. Kyocera, which is a ceramic company, so they…

BROCK: Substrates. Electronic substrates.

FIALKOV: But I still think that there was a government market for semiconductor circuits built on sapphires.

BROCK: There is indeed. I was wondering if it was for that, sort of, electronic substrate, integrated circuit substrates…or I suppose you could also use it at that time for lasers, I suppose.

FIALKOV: Never became a major market, but I still think there's a government market for semiconductors…

BROCK: Yes. Kind of also in the materials side, but in Massachusetts rather than California.

I saw a company called the Valtec Corporation, if I'm saying that correct. It looked like it was making quartz or quartz devices.

FIALKOV: We sold a company to Valtec. Valtec…I'm trying to remember the name of the company we sold to them. They made lamps…some semiconductor material that lit up. They made lamps with streams of this material that lit up.

BROCK: Interesting.

FIALKOV: And it was probably some kind of LED [light-emitting diode] thing. But we had an investment in the company that made the semiconductors, and Valtec acquired it for their lamp business.

BROCK: I suppose, at the time, it must have been a very specialized…

FIALKOV: It was. […] I don't know that I have any records of that, but I'll look. You never know.

BROCK: […] Related, as well, to the semiconductor side was a firm called Dynalec Systems from Glen Rock, New Jersey, that looked like it was making some sort of a communications device, a modem or a multiplexer or something like that.

FIALKOV: Something like that. It turned out to be a flop and just disappeared. They were one of our first investments […].

BROCK: When you were starting out with Geiger & Fialkov, very early in terms of venture capital partnerships, when you started out, did you have an expectation of what you hoped your success to failure rate for these ventures would be?

FIALKOV: Yes. We assumed the following, 30 percent would be successful…like, reaching a ten to one return. Thirty percent would be alive, but not worth much more. Thirty percent would fail. We were hoping that 10 percent would be a big success, which is what made venture capital interesting. One out of ten. All you needed was one in your portfolio to be a major success and it made the portfolio. The rest was hard work. As it turned out much harder than being involved in a company with divisions. Because if one division had trouble, it could be supported by the others. You could have one venture company, one portfolio company, help another one. So, being in the venture business was tough. But that was what we assumed. It didn't always work that way, of course. […] When you invested and when you decided to liquidate was a big problem.

The last one, which is Newlight, had about four companies ready to go public when the recession hit. None of them were success…well, one company went public, and the stock went from ten to two. The recession was no time for that. They were the company that made fingerprint access to computers. They were the leading company in the field and all the Japanese companies were customers. But when the recession hit, nobody wanted to pay extra [for] fingerprint access, so they lost major contracts. It's still a public company, but I think the stock is somewhere in the two dollar range and they, ultimately, went public at ten. I think that Newlight sold a large percentage of its portfolio at or near the public price. About six months after it went public they sold. So, Newlight did have a return on that. But what they're left with is worth very little.

BROCK: […] Where did your expectation come from about those percentages that you were shooting for? Was it your own thinking or was that something from investment banking?

FIALKOV: Sort of […] general expectation…

BROCK: Yes.

ULRYCH: Common knowledge type of thing…that's what people were saying.

FIALKOV: The whole idea of venture capital was the *one* big success.

ULRYCH: And you get used to failure?

FIALKOV: Well, you have to get used to failure. I had a local bankruptcy lawyer that we worked with. [laughter] I learned something about bankruptcy law. So, you can't be afraid of failure. Sometimes a failure […] is caused by circumstances; sometimes your partners in the venture refuse to put more money in [and] a company needs more money in order to succeed. So, they let it go. We've had companies that ultimately would have been very successful that weren't because […] they spent money expecting to be able to raise more and times changed and they couldn't raise more. There are all kinds of the reasons for failure.

BROCK: One firm that seemed quite unlike the others was something called the National Petroleum Corporation […].

FIALKOV: That was a Canadian firm. […] I think it was an American oil prospector.

BROCK: Oh.

ULRYCH: You got into that?

FIALKOV: Geiger was interested and I don't know whatever happened. I don't know if it was bought or merged. I don't remember. […] That was not a success.

BROCK: One that is very well known from the history of semiconductors and computers, I guess too, is Four Phase Systems, […] which I guess is a Fairchild spinoff…wasn't it?

FIALKOV: I was on the board of Four Phase.

BROCK: You were. Yes.

FIALKOV: And they were pretty successful at creating computers. They sold out to Motorola. But that was after I left the company […].

I found at one time, [I had] too many boards on the West Coast. I just couldn't get them to hold board meetings so I could attend them on one trip. I just said there are some of them that I just have to give up and let them go their own way.

BROCK: Was that a firm that Geiger & Fialkov helped to fund?

FIALKOV: I think it was Geiger & Fialkov. It was too early for PolyVentures. It was one that Arthur had some interest in and that's why I went into it. It was run by a very smart fellow. I don't remember his name.

BROCK: I think his name is Lee Boysel.

FIALKOV: Lee Boysel, right.

BROCK: He was there. I don't know what he did after it was acquired by Motorola. I'm not sure. I think in the past we talked about this firm called Micro Design in Maryland […].

FIALKOV: Micro Design was a group of ex-NSA people, who were the best designers of computer circuitry around. The only trouble is they decided theirs was a company that created a computer to minimize problems in communication. [This] was very important for NSA. So, they had done it and they did it again, but nobody wanted to pay the price. The government had no choice.

BROCK: And they were hoping other telecommunications companies would need it.

FIALKOV: Right. […] If instead of designing a computer for that purpose, they designed a computer that Intel designed, they would have been first. That's life. [laughter] But they sold to AMI […].

We had already arranged for them to merge with Standard Resources, which was the forerunner of Standard Microsystems. The boards had voted, but they didn't want to do business with the New York people, and they sold themselves to AMI. We couldn't sell them to somebody they didn't want to be sold to, so they went to AMI. Then we had to go find ourselves designers.

BROCK: Right. An interesting looking firm, to me, was a place called Granger Associates in Palo Alto. That seemed to be associated with this big, very well known engineer, I take it. John [V.] Granger or something like that…

FIALKOV: John Granger. Also Frederick [E.] Terman was on the board.

BROCK: Oh, wow.

FIALKOV: He wrote the encyclopedia.[13] And I was on the board of a company in Long Island—again, the name escapes me; I might find it—[…] that made antennas for airplanes.

BROCK: Oh, okay.

FIALKOV: And they merged with Granger. The name of the company in Long Island was Dorne & Margolin. Arthur Dorne was the president, [a] friend of mine, and he invited me onto their board. I don't think I was an investor in it. […] When they merged with Granger, Arthur and I went on the Granger board. As I said, it was a very interesting board. Terman was on the board. It was a group at Stanford, and I don't know what became of them because, when I lessened my directorships in California, that was [one that I dropped from].

BROCK: What was Fred Terman like? What was your impression of him?

FIALKOV: I was very impressed. Very impressed because […] he had an outstanding reputation.

BROCK: Yes. I think I saw in my background research that, I guess, John Granger had been, around that time, the president of the IEEE [Institute of Electrical and Electronics Engineers]. So, you had some very high powered electrical engineers in that group.

FIALKOV: […] Yes.

[13] See, for example, Frederick E. Terman, *Radio Engineering* (New York: McGraw-Hill Book Company, Inc., 1932); *Measurement in Radio Engineering* (New York: McGraw-Hill Book Company, Inc., 1935); *Fundamentals of Radio* (New York: McGraw-Hill Book Company, Inc., 1938); and *Radio and Vacuum Tube Theory* (West Point: United States Military Academy, 1942).

BROCK: Speaking of well-known names, another company that you participated on the board of was […] the Benrus [Watch Company].

FIALKOV: The Benrus Corporation, later the Wells Benrus Corporation. Benrus Corporation was a watch company. A fellow that Arthur Rock went to Harvard with acquired…he and another fellow acquired the Benrus Corporation, the watch company. Arthur didn't want to serve in any boards on the East Coast, so he had [me do it]…who's the other fellow? Another friend of Arthur's, who was also on the Intel board…Sandy Kaplan.

BROCK: Yes.

FIALKOV: Sandy Kaplan and I became directors of […] Benrus. They later acquired a jewelry company called Wells, and they changed the name to Wells Benrus Corporation. What was the name of the important fellow?

BROCK: Victor Kiam was the president, or the CEO, or what have you.

FIALKOV: […] He's deceased, but he wrote a book before he went. He ultimately became an owner of the [New England] Patriots…

BROCK: […] Oh, I didn't realize that.

FIALKOV: …which was a flop for him. But, Wells Benrus came upon some hard times. They ran through the problem…I had started a […] personal venture company called Aleph Null. Aleph Null borrowed money and loaned it to Wells Benrus at very high interest rates. I think there was a period of time when the interest rates were 20 percent.

ULRYCH: […] During [James "Jimmy" E.] Carter's time?

FIALKOV: Yes, I think so. Wells Benrus, I believe, came upon hard times after I left. But it was very successful for Aleph Null. That's where our income came from. We loaned them money to expand, or buy equipment, or whatever. They didn't make it in the watch business. They made good watches. They sold a lot to the government and it was a well-known name…a brand name that was well known. But they didn't make good enough watches […] that they could sell at high prices. So, it was just an "also" watch company.

I don't know what became of it. They used to have a box at the [U.S] Open every year with their big name on the clock over the […] Open. I enjoyed tennis. They were in Connecticut, and I stayed with it as long as it made sense. Victor sent me a sword for performance above the call of duty. I still have it hanging up in my house, in the closet. [laughter]

ULRYCH: But […] they were selling to the government? So, military watches or something like that?

FIALKOV: They sold military watches, but they [also] sold regular watches. […] They tried to be a major watch company. […] But they didn't sell the high end. […] They didn't have a name that came from Switzerland. Ben and 'rus' were the names of the original founders [Benjamin, Ralph, and Oscar Lazrus]. I went to board meetings regularly in Connecticut. Wells was a jewelry company…where? I think it was in Rhode Island. It was in Rhode Island, on the pathway between Rhode Island and Massachusetts. [I'm] trying to remember the name of the town…Attleboro, [Massachusetts], that's where they were.

BROCK: Later into the 1970s, I saw a reference to something called the Codi Corporation […] that seemed to be a semiconductor outfit.

FIALKOV: Codi was a diode rectifier company in New Jersey. […] I took a position and it was a public company. I took a position in it and went on the board. My recollection is that they continued to be small and did well. Why I left, I don't know. I don't know what happened to them after I left.

BROCK: Do you think in these different board experiences that you had, was there a common thing that you felt that you would bring to the board, or was it different for each case?

FIALKOV: I always felt that I could bring a great deal to the board because I knew so much, because I had so much experience. One person can usually move the board in the right direction and if you cannot, there's no sense staying. And I found that my partner in Newlight was never able to move a board in the right direction. He went along with what the other board members wanted to do, which was not good. I've had some bad experiences there. But, you have to be a loud voice on the board.

BROCK: Did you find yourself often at odds with other directors, or were you just kind of the outspoken person?

FIALKOV: I was the outspoken guy.

BROCK: So, you would be framing the discussion in a way.

FIALKOV: But sometimes it didn't work, for instance, [with] two companies in particular that I was involved in. One was called Globecomm [Systems]. It's a public company. The other one was called Primus Telecommunications, another public company. Globecomm had a rise to about fifty dollars…no, forty dollars a share from…after going public at a very small amount, and decided to raise some money. By the time it was raising money, the stock was selling at around thirty-two. I was on the committee, on the pricing committee. It came back to them…the underwriter came back to them and said, "We can't sell it at thirty-two. We can sell it at twenty-seven." Everybody else on the committee said, "Oh, we can't do it at twenty-seven." I said, "Take the money." Right. They took the money, all right. They took the money, and it let them survive through many unprofitable years, and now they're profitable doing about two hundred thousand a year. They're a profitable company. I tried the same thing at Primus. Primus was able to raise a billion dollars, but mostly debt. I said, "Sell equity." They don't want to get depreciated out.

BROCK: […] Oh, yes.

FIALKOV: They could sell all the debt they want. They grew to […] doing over a billion dollars a year. But then hard times hit, and they went bankrupt because they couldn't pay the interest. That's two stories that I tell boards now, still. Sell equity, not debt. If you can raise money, sell equity.

BROCK: Because that's fundamentally less risky to the firm?

FIALKOV: You never know what's going to happen in the future.

BROCK: Right.

FIALKOV: All you need is one bad year, and the banks pull in, and you're dead […].

BROCK: […] With your experience with all these different firms, you've seen that time and again. To go back to those firms that you were involved with in the later 1970s, another one

that I saw was called Computer Instruments Corporation, which I think [is in] Hempstead, New York. That's in Long Island, isn't it?

FIALKOV: […] A friend of mine asked me to go on the board. They were a small company doing well. I went on the board, but it was because a friend asked me. I don't think I had a position in it. I was on the board for a number of years. It was a public company, and as far as I know, it was still a small company doing well when I left.

BROCK: One of the last names that I saw from the later 1970s was something called Entertainment Systems Incorporated that, I think, was in Florida.

FIALKOV: Entertainment Systems…now, what did they do? I remember the name very well. I remember it because it was the only company that the SEC [United States Securities and Exchange Commission] examined me on for some reason. I don't remember what they did. I'll find out. I think the fellow sold stock privately [and] got into some trouble with the SEC.

BROCK: In this era, when you were taking stocks public, […] which exchange were you working with? The American Stock Exchange, New York Stock Exchange…?

FIALKOV: […] Mostly over the counter.

BROCK: Over the counter […]?

FIALKOV: I think Benrus was on the American Stock Exchange. But it was mostly over the counter. You didn't have to be on an exchange anymore.

BROCK: Okay. […] I guess something I'll have to look into a bit more. I'm not quite sure that I understand how the trades in over the counter stocks work. Is there a central area where you can find out what these things are trading at, the different securities?

FIALKOV: I think you can find it in a minute. It's a very good market. You call your broker and he'll tell you how many shares are offered at what price.

BROCK: […] Is there a central organizing…

FIALKOV: NASDAQ [National Association of Securities Dealers Automated Quotations].

BROCK: NASDAQ, yes?

FIALKOV: Yes. Those that are listed that are qualified to be listed on NASDAQ. But there's a lot of over the counter stocks that are not. They call them the "Pink Sheets."

BROCK: And it's still handled through the mechanism of NASDAQ?

FIALKOV: […] No, they're not. They're handled through people who specialize in trading them.

ULRYCH: So, there are brokers who do that.

FIALKOV: There are people who do that. […] Just like specialists on the New York and American [exchanges], there are people who just do it on their own […]. You used to see all their information on the board, and you saw what was going on.

BROCK: And […] has that diminished over time? […] What's your impression of that?

FIALKOV: […] There has to be a mechanism for trading stocks that are delisted, because they're no longer qualified for NASDAQ. NASDAQ has real hard rules and if they're delisted, people still want to buy and sell.

BROCK: And so there are some firms that would be like market makers and investment houses that would have a market for these stocks.

FIALKOV: There are some large investment houses that have small groups doing that.

BROCK: I see. I understand now. So, that's been a consistent…there's been an important, consistent role for that over time.

FIALKOV: There has to be.

BROCK: […] Is it also an important place, […] not just when a stock is delisted for whatever reason, but also for new ventures? Is it important for them?

FIALKOV: New ventures went on NASDAQ when they went public. But very important to be listed. You didn't want to be on the Pink Sheets. Pink Sheets were the companies that were no longer qualified by the rules that NASDAQ insisted on.

BROCK: Right, okay. Let's see. I guess, keeping […] in the semiconductor vein, I saw […] when you closed Geiger & Fialkov in the later 1970s […] how did it shake out in terms of those percentages that we had been talking about before? Do you think you had 10 percent that were the real high fliers?

FIALKOV: Well, we made a lot of money on Intel. Standard Microsystems was Geiger & Fialkov. That was a winner.

BROCK: Right.

FIALKOV: Another winner was Microsemi. We had already sold Intel. But […] I think there were five companies that we distributed to the partners. Microsemi was one of them. We had a lot of that. Standard Microsystems. I'm trying to remember what the others were.

BROCK: Was Teledyne one of the…

FIALKOV: No. Teledyne was a personal investment for me […] that I bought at a certain price and sold at [another higher price]. That was before Geiger & Fialkov.

BROCK: I understand.

FIALKOV: […] I was investing with Arthur. But Microsemi did very well in time. Those who held onto it did very well. It's still a very good company.

BROCK: One of the firms I saw […], from the period of the early 1980s, […] was Three Dimensional Circuits […].

FIALKOV: It was a printed circuit board manufacturer. They got into trouble. They were polluting the ground and they wound up bankrupt. It's a company that I […] invested in because a former friend of mine, a former partner of mine at General Transistor was a major owner. They just had poor management […]. The president was stupid. […] They weren't the only company making printed circuit boards that were polluting. They got into bad trouble.

ULRYCH: How was it that they weren't the only ones, but how is it that they would be one of the few that got caught?

FIALKOV: I don't remember. They made good printed circuit boards, but they didn't follow the rules in getting rid of their bad chemicals.

BROCK: How about Princeton Sensors? That was a company I saw listed.

FIALKOV: Princeton Sensors […] made something that you would put into the smokestacks of utilities and let you know when you were operating inefficiently.

BROCK: Okay, yes. I do recall that.

FIALKOV: And utilities were making all the money they wanted without spending money on capital. Now, of course, the time has come where that's probably a good market. [laughter] But then, it wasn't. Of course they were polluting. They knew they were polluting. They knew they were not operating efficiently. But they asked for increases in rates. They get increases in rates. They didn't want to spend money they didn't have to spend.

BROCK: And so eventually that company faded out.

FIALKOV: Faded out. Their market didn't develop. They had an excellent product. It told them when there was a certain amount of carbon monoxide or dioxide being wasted, but nobody wanted it.

ULRYCH: What was your motive in investing in this company […]?

FIALKOV: There was another venture capitalist named Hardie Sheppard. He liked it; I liked Hardie; and I went into it. It had an excellent product and an excellent product market, except that it wasn't a market.

ULRYCH: […] The market existed in theory, but not in fact. […] You didn't go in there thinking that this was a socially responsible sort of investment?

FIALKOV: No.

ULRYCH: […] Your friend was in there…

FIALKOV: It was increasing the efficiency of the fuel you were using.

ULRYCH: Right, so that's socially responsible […].

FIALKOV: That wasn't the purpose. It wasn't a "green" thing. It was just a sensible thing.

ULRYCH: Right. And you thought it would make money.

FIALKOV: Yes, a huge market.

ULRYCH: And then you found out it really wasn't there.

FIALKOV: That's right. Timing is very important.

ULRYCH: Right. Same thing might be said about the generic drugs, that the time wasn't right. Here, again, the timing wasn't right. But the underlying idea was good.

FIALKOV: Yes. You have to be lucky too.

ULRYCH: Well you get lucky one out of ten times…you're doing well.

FIALKOV: That's right.

BROCK: A quite different sounding firm was, I guess, from a little bit later in the 1980s, was Barricini Foods. […]

FIALKOV: Somebody I met was in the candy business. Barricini Foods was available for acquisition. He convinced me that the two of us should buy it and become partners.

ULRYCH: This was a friend of yours or just a guy you know?

FIALKOV: Somebody I met. You went into the monthly meetings at Long Island Venture Capital or whatever, and you met people. He was an impressive guy. He knew what he was doing, and it was a brand name that was very well known to me. […] And he said, "Here's an opportunity to own this brand name. It's like a cash cow." So, we bought Barricini Foods. Then, we found a group of people who had once been…I don't know what you would call them—hippies or something—that started their own farm down south and making products. They started making tofu-based desserts.

BROCK: […] This is in the 1980s, I think […].

FIALKOV: Yes. I think there was a company doing that called Tofutti. This would be competing with them. It turned out to be a tough business because you had to buy space in the supermarket frozen section. So, you had a capital to do it. But Barricini had a name, which is better than Tofutti. So, we competed with Tofutti for a while, and [we licensed out the candy business]. We were getting licensing fees. We were doing well. But the tofu business became very difficult, because Tofutti became experts at making deals to get space. […] We ultimately sold Barricini Foods. It's still a public company by the way. I had […] sold all my stock to my son-in-law as a tax loss. So, he's a major stockholder […].

Ultimately, there was a group who wanted to buy it. It was sold to a company called Hain Food [Group, Inc.], which is a successful public company now. The Barricini Foods' shareholders and debtors got stock in Hain Foods, which we promptly sold because it was cash. Should have held onto it, because Hain Foods has been a major acquirer of firms in the business. It's a well-known public company. They make tea, for instance […]. They acquired a company making various teas. So, I got some stock in Hain Foods, and so did most everybody else. But Barricini Foods did not sell its public company, so it became a shell corporation. My son-in-law

is trying to find a partner to merge with it and hasn't been successful. It still has some cash, and I think they're just dissolving it. But it actually was sold, so the shareholders did wind up with something good.

ULRYCH: But this was a company that you went into. […] This was an area you're not that knowledgeable about?

FIALKOV: Not knowledgeable at all, […] except I knew the brand. There are two brands in the candy business, Barton's [Candy Corporation] and Barricini's. I thought, let's see what happens, and if we just kept getting license fees for the candy business, we would have had a cash cow. But my partner decided we [should] get into this tofu business, and it was a tough business.

ULRYCH: Do you feel that it […] went down that road because you weren't familiar enough with that area?

FIALKOV: I learned later about what it cost to sell frozen foods, to get space in the frozen foods sections. You have to pay a lot of money.

ULRYCH: So, neither of you really knew that business at all.

FIALKOV: No. He just knew the candy business.

ULRYCH: I was just wondering if there was a lesson out of that. In other words, "stick to what you know."

FIALKOV: But there's still Barricini ice cream being sold, Barricini candy being sold.

BROCK: More closely connected to your experience with high technology was a firm called General Ceramics that seemed to make some sort of exotic ceramics.

FIALKOV: General Ceramics was a company well known in the field. That was in the ceramic business. There was a fellow on Wall Street (the name escapes me for the moment) whom I knew. He wanted me to be on the board, so I made an investment in it, and it succeeded. It was a very successful company. It was sold to the Japanese ultimately.

ULRYCH: To Kyocera company?

FIALKOV: […] I think so. […] And that was a profitable investment.

ULRYCH: Where was that company located?

FIALKOV: […] In northern New Jersey. I used to go there often. I don't remember the town.

BROCK: […] Yes. […] Now was that for general […] industrial use of ceramics? Or were they in the semiconductor world also?

FIALKOV: Both.

BROCK: Both. Then, I saw a listing of GeoTel [Communications], which I think was in satellite telecommunication work.

FIALKOV: GeoTel, another sad story. It was a successful company, public company, that apparently fell on hard times for two reasons. One is the fellow who was running it was a pretty smart guy. But, again, he went into debt with the banks. Their controller started playing the stock market with the company's funds and lost about a million dollars.

BROCK: My gosh.

FIALKOV: Finally wound up in jail. GeoTel survived that, because the fellow was running it had good relationships with the banks, and was able to borrow money. But he ran into a major problem, because he went into a new business that provided employees…and this was a business where you paid the employees immediately, but the people to whom you sold them paid you in sixty, ninety, or hundred-twenty days. So the faster you grew, the faster you got in trouble. The banks closed it. He became the dean of the business school at Long Island University in Long Island. […] Again, borrowing doesn't belong in a venture business.

BROCK: Yes.

ULRYCH: And you invested in GeoTel or you were just…?

FIALKOV: I invested.

ULRYCH: And you had confidence in this guy who was running the company, I guess.

FIALKOV: Yes. It was a successful company. [A terrible thing]. They had the controller […who] must have borrowed some money and then got into trouble. He figured he would invest the company's stock. The bank required two signatures. They gave him money with one signature. There are lots of reasons for failure.

ULRYCH: […] It's interesting. And also, this new business they went into, providing employees…so, I can't imagine how that works. You're paying these people. They go to work for someone else. And then, one-hundred-eighty days later, you get the money back […].

FIALKOV: The faster you grow, the faster you run out of money. So, he thought he could…he thought he had receivables. He was really factoring those receivables. But it didn't work. The fellow who was running that department, ultimately, is running a successful business doing that, now.

ULRYCH: Oh, really. Did he change the rules by which it worked or he just had enough capital to make it happen?

FIALKOV: […] I don't know. He's a fellow named Sysinsky. I see him once in a while. He's doing well.

BROCK: Well, let me just stop the tape…

[END OF AUDIO, FILE 4.1]

BROCK: Back on.

ULRYCH: I was told we could stay here.

BROCK: Oh, great. There was another firm from this period […], Radyne Corporation, which looked like it might have been in semiconductor manufacturing equipment…

FIALKOV: No. […It was a] communications company, and they were only recently merged into another company. It was a public company that I helped take public. They ran into some hard times, some good times, but they ultimately became a well-known company, very successful. And recently merged into…they are actually in Arizona now and merged into a Long Island company.

BROCK: What sort of communications business did they have?

FIALKOV: That's a good question. I don't remember. Probably the major customers were the government. But that was a winner. Aleph Null had that and did well with it.

BROCK: I saw […] a listing of some companies that I think are from this same era of later 1980s that, I think, […] may have been private rather than public companies. One was called Control Transaction Corporation.

FIALKOV: Control Transaction was a company that one of my friends and coworkers at General Instruments was involved in. They were in New Jersey, and they made equipment that the restaurants use for punching in […] the orders. They were a successful company. I don't know what happened to them, but I left them after a while. I did make an investment in them, and I don't remember what happened to it…been a long time.

ULRYCH: And you did that because you had this friend who…?

FIALKOV: I had this friend. […] I ran the semiconductor business at General Instrument, he ran the military business.

ULRYCH: So, you had confidence in this person.

FIALKOV: Yes. He died recently. He was about my age.

BROCK: Another […] private company from that era was something called EMS [Development] Corporation, which seemed like it worked in magnetic stuff for the government?

FIALKOV: EMS had a business selling equipment to ships to get out of the way of mines. Major customers were the large ship building companies for the government. They were ultimately sold to a British company named Ultra. PolyVentures was in them. I was in it, personally. They ran into some hard times. They reorganized and were sold to Ultra, and they're still doing business in Long Island. Doing okay.

ULRYCH: What was the motive to invest in that operation?

FIALKOV: It's a good question. Also, I knew the fellow who was running it, and it seemed like a pretty good investment, because they're always building ships.

ULRYCH: In the military.

FIALKOV: Yes.

BROCK: And they're always building mines […].

FIALKOV: And every ship has to be equipped with mine avoidance equipment […].

BROCK: Another firm was called the Overseas Telecommunications, [Inc.], or OTI […].

FIALKOV: The same fellow who started Primus had started Overseas Telecommunications. I became a stockholder, and board member, and they were a successful company, also selling communication, satellite communication.

BROCK: Satellite communications?

FIALKOV: Just like Primus did after them

BROCK: That's selling space…like, reselling bandwidth on the satellite.

FIALKOV: Yes. They purchased the equipment, the space, and they sell parts of it. And he built a very large business and I think he sold it to MCI [Microwave Communications, Inc.], and then started again with Primus.

BROCK: With the same sort of business.

FIALKOV: Yes. Those are my attempts to build a bridge across the Atlantic, which was a childhood dream. [laughter]

BROCK: I remember that you had mentioned that before.

FIALKOV: I thought I […] could do it with my erector set. [laughter]

BROCK: This was also the era of that TeleBase Systems, wasn't it…

FIALKOV: Yes.

BROCK: …that we had talked about before. […] I don't remember if we discussed who it was who came to you with this concept.

FIALKOV: […] There was a fellow called Marvin [I.] Weinberger in the Boston area—one of the suburbs of Boston. A fellow I had known and worked with before […] introduced me to him. [He] had this idea of providing information over the internet. Marvin Weinberger introduced me to TeleBase, who were also interested in the same field. They were in the Philadelphia area, Narberth, right outside of Philadelphia. I invested in TeleBase and we merged the New England company, which were only a couple of people, with TeleBase, which were only a couple of people. We started expanding into the field of providing information, which was really the job of getting the right software to do it, and making deals with the people who had the […] information. That did well. My grandson, during his senior year, went to work for TeleBase. TeleBase decided to spinout. Weinberger and my grandson—Weinberger was 90 percent originally and my grandson with about 10 percent. My grandson had just finished college, and they spun out into a company called Infonautics, which started with the Homework Helper product. And sooner or later, they found out the adults liked it and it became an important product. […] They got some venture money, and they went public and ultimately

sold to […Bell & Howell]. Successful, but it started my grandson on his venture business. After Infonautics was sold, he started a new company called Half.com.

BROCK: Which is still an ongoing concern, isn't it?

FIALKOV: Half.com, he sold to eBay for about three hundred-seventy million dollars.

BROCK: Wow, very successful.

FIALKOV: I think he wound up with about a hundred million dollars in that. So, I have a very wealthy grandson. He's the one that gets the family together and does all the histories and so on. He bought himself a mansion in Gladwyne, [Pennsylvania], with about thirteen bathrooms, five garages, and a lot of acres, something I never did. I was very happy with an ordinary house.

ULRYCH: Well, it's a generational change.

FIALKOV: Yes.

BROCK: Did he continue in a little…?

FIALKOV: […] He wound up running a five hundred million dollar a year operation for eBay. In other words, they combined his, which was about two hundred fifty million dollar operation, with another one. He wound up running a very large operation for eBay, but then left eBay…I guess, sold his stock. I don't know if he kept any of it. He then raised about a hundred-twenty-five million dollars for his venture firm, which invests in startups. It's called First Round Capital and he's doing well.

BROCK: […] Infonautics was sold to the camera company. What happened to TeleBase?

FIALKOV: TeleBase was also sold to somebody. That's a good question. Let me find out. I have a good source of information there. I'll ask my grandson.

BROCK: […] I saw reference to another firm called Stynatic Systems, which seemed to be from maybe the middle to later 1980s, that seemed to be making a personal computer of some kind. Does that…?

FIALKOV: What's the name of it?

BROCK: Stynatic Systems.

FIALKOV: X-Y-N-E-T-I-C?

BROCK: I had S-T-Y-N-E-T-I-C. **[…]** Perhaps that was the spelling I saw in one of the documents. Maybe it was a typo. That was the automatic plotter, wasn't it?

FIALKOV: Right.

BROCK: Yes. Maybe that was just a typo in the documents. We talked about that in an earlier interview…

FIALKOV: Yes.

BROCK: There was Cordon Precision Optical.

FIALKOV: Cordon Precision Optical…

BROCK: I think that was a PolyVentures era.

FIALKOV: …was an investment made by a fellow named…was a company run in Taiwan by a fellow named Richard Adler, who was the sales manager of General Instrument, a very sharp, successful sales manager. He had some products, some optical products that were pretty interesting. It was a company in Taiwan. I don't remember that turning out well and I don't remember what happened to it. He was not a good person to invest in. He was a good salesman, but he was not aboveboard.

ULRYCH: As you found out.

BROCK: […] Most of your investments seemed to have been in the U.S. […] Was this one of the few firms that you invested in [abroad]? No?

FIALKOV: We also invested in a couple of Israeli companies that were very successful, the one that was sold to OPAL, and one that was sold to Intel for 1.7 billion dollars.

BROCK: That's the DSP Group.

FIALKOV: DSP Communications. […] So, OPAL was sold to the great firm on the West Coast. […] OPAL made metric equipment for measuring the chips…

BROCK: […] So, did that go to, maybe, to Applied Materials […]?

FIALKOV: Yes. That was sold to Applied Materials. That was a successful company, and [I got] a very good plaque from them thanking me for my board membership.

BROCK: One firm that I thought sounded very interesting was something called the Automated Reasoning [(Pty) Ltd.], which seemed like it was building expert systems for semiconductor work. That's what it seemed like to me.

FIALKOV: That was something that my partner was involved in, Shelly Harrison, at PolyVentures. It was a group in Boston who had the technology, and I know very little about it. I was never on the board.

BROCK: Perhaps not. I think I got that from a list of PolyVentures' investments.

FIALKOV: Yes. It was Shelly Harrison was out to that. It was no big deal. It was an exciting kind of idea at the time and I don't know what happened to it.

BROCK: […] In addition I saw, it looked like, two companies that were both in the whole area of displays. One was called Applied Photonics. One was called Infodex Systems […].

FIALKOV: Applied Photonics I remember. Infodex I don't. Applied Photonics was a company that made special lasers; I don't remember for what market. It was not a winner. The fellow knew what he was doing, but the market wasn't great.

ULRYCH: Too soon […]?

FIALKOV: I don't remember. I remember leaving the board. My son-in-law went on the board. I don't know what happened to it. It was not a winner.

BROCK: One thing that I saw reference to that I don't think we talked at all about in the past was your participation in a small investment banking firm, Krieger, Wunderlich, Fialkov, Scheinman Company […].

FIALKOV: It was originally a company […] run by Krieger and Wunderlich. It was Krieger Wunderlich. I invested in it. They added my name. Then Dr. Scheinman invested in it, they [added] his name. They merged the company into another securities company. I think the name was Murphy…something or other. Murphy was a no-good guy, another bad…it's a bad merger. […] Krieger raised a lot of money for companies I was involved in. He broke up with Wunderlich after the merger, after Krieger Wunderlich was merged with Murphy something. Murphy went broke ultimately. But Krieger and I are still good friends. He's still raising money for the company I'm involved in, InfoTech. I lost contact with Wunderlich and Scheinman. I don't know where they are.

BROCK: […] What was your role in that investment banking firm?

FIALKOV: The role was raising money for early-stage companies, which Krieger was very good at.

BROCK: And so you made it an investment with them […]?

FIALKOV: […Yes], Krieger Wunderlich was an existing company. I invested in it. Then Scheinman invested in it. And they bought a building for their headquarters in Rockland Center. We ultimately sold the building to the guy, to the doctor who bought my home in Westbury, [New York]. [laughter] So now, it's full of doctors.

BROCK: […] I think the list that I have now are more recent firms that you were involved with. We talked about Primus Telecommunications. Another one was called Snickelways [Interactive…].

FIALKOV: Snickelways was a firm that did websites for other companies. They were growing by leaps and bounds. I think PolyVentures […] invested in them.

BROCK: I believe so.

FIALKOV: I made a personal investment in them, as well. I was on the board. They were a bunch of smart people who had fantastic backlog, growing backlog. When the bubble burst, their backlog disappeared and they were out of business, which was maybe lucky for them, because they were located right across the street from the World Trade Center. If they were all there [on 11 September 2001], they would have been gone. But […] their business just disappeared.

BROCK: Overnight.

FIALKOV: Overnight. They were very good at what they were doing. They had very good contracts, but their customers were people who were growing businesses and had to raise money to keep growing. Suddenly, financing disappeared, and the business disappeared. Snickelways is some British name for a small shopping strip. [laughter]

BROCK: Oh.

FIALKOV: Where they got it, I don't know.

BROCK: I saw a mention, too, of a company called NetSat Express, which looked to be like satellite internet.

FIALKOV: NetSat Express was a subsidiary of Globecomm, and it's still operating. It's part of Globecomm business. It's in international communications or satellites.

BROCK: Now, […] did they get contracts from telecommunications companies to provide…?

FIALKOV: Mostly from major foreign governments.

BROCK: To provide them with telecommunication service?

FIALKOV: Equipment.

BROCK: Oh, the equipment.

FIALKOV: They make the equipment for accessing the satellites.

BROCK: I gotcha.

FIALKOV: And they also run a service, which is NetSat, which [provides] international communications just like Primus does. It was a subsidiary of Globecomm.

BROCK: Okay. Integrated Environmental, we've talked about before. We touched on Israeli Pharmaceuticals, but I don't think we went into detail on that.

FIALKOV: Let me find out whether it's the one that's still going or whether it was another one. It might have been a company called Israeli Pharmaceuticals, which was really an Israeli research company. Let me look them up.

BROCK: In the software vein, I saw a listing for a company called FamilyKeys.com.

FIALKOV: This fellow had a business selling software that insurance […] companies bought and gave to their agents who gave it to their customers to list all their possessions, their inventory in case of a disaster. […] They would have it all listed, medical records, would have it all listed. It was software for family information. It was a small business that, as far as I know, was still doing a modest amount of business, not very much, a couple hundred thousand dollars a year. The proprietor died—he had Crohn's Disease, and it finally got him (I learned that about a year ago). I don't know if his wife is carrying on or what, but she doesn't contact me anymore.

It was a small business. I had invested in that. […] I thought he was not a well man and he had to travel a lot to get business. So, it was an opportunity for a younger person. I thought that my second grandson might find that as an opportunity to […] finally wind up with that business and build it. But he never went for it. So, it lasted until […] the proprietor died. [His wife] may still be running it.

BROCK: Just a couple last entries on the list. One was, I guess, still in the communications/telecommunications theme […] called Newpoint Technologies.

FIALKOV: Newpoint Technology was a communications company in New Hampshire that was sold to a public communications company. It's probably doing very well with it. My partner didn't want to put more money into it, and it needed more money in order to grow. He didn't like the people who were running it, and so he refused to put more money in it. So, we sold it. It was no winner, and we were supposed to get certain proceeds over a period of several years, and I don't think it panned out.

BROCK: What about one called Perlucid?

FIALKOV: Perlucid was a company that sold equipment to restaurants. [The equipment] collected […] the bad liquids [that are so hard to dispose of]. They would go to these restaurants and take the liquids and dispose of them. It was a company that did well for a while, but large competitors took over the field, and it went away.

BROCK: Last one on the list here is AMS-TEX Enterprises […].

FIALKOV: Never heard of it. [laughter]

BROCK: […] AMS-TEX Enterprises. I don't know how you would say it.

FIALKOV: And what was it listed as?

BROCK: […] That was the extent of the information I could find out about it. […] Which of the firms that you're involved with currently are you most…?

FIALKOV: I'm only involved with InEnTec.

BROCK: With InEnTec. How is that going today?

FIALKOV: Well, let's see. […] At a very important point. They've got a couple projects. One is to turn [garbage into energy]. They're working with [one of] the major companies in the field, Waste Management. […] The other one is treating chemical waste, and they're working on a major project that has run into some technical problems. But I think they're close to having solved that. That's a subsidiary called InEnTec Chemical. And when they finish solving that, they'll be able to raise money on good terms. They've recently sold shares at about nine dollars a share, which is very substantial price over the original prices. But they hope to go public by the end…middle of 2011.

BROCK: Very soon.

FIALKOV: And that's got a huge potential. It would seem to me…why the government was wasting money on making ethanol from biomass…doesn't make a major investment in this, because it's not easy to make ethanol out of garbage. Garbage isn't something that affects the price of corn or wood or whatever else they use for biomass. So, the idea was right, but it's taking thirteen years to get to this point. Never made money, but they've been able to raise money to keep it going. Sometimes you have to be very patient. So, there'll be a board meeting in July. I'll know more.

BROCK: Well, […] that was the list of firms that I had written down for talking about today. I don't know…. Richard, did you have anything that you wanted to discuss today?

FIALKOV: Very different.

ULRYCH: Yes, very different. I was wondering if there were any kinds of lessons to be drawn from that? […] And, the reasons for failure were different, and the reasons for success were different.

FIALKOV: Well, [for] success you need stubbornness. You've got to get through all the hard times. […] Every success made it through some times when they were hanging on the thread.

ULRYCH: Right, but you had to be persistent into failure as well.

FIALKOV: Yes. Well, failures you're supposed to get rid of just as quickly as possible, because it takes up your time. The worst thing about venture capital is there can be a year when you've got five or six companies in trouble. There's very little you can do about it, because you run into these bubbles that burst. Business just disappears.

ULRYCH: But I mean with some […] things that didn't work out, the market wasn't there…you were ahead of your time.

FIALKOV: Or you chose the wrong market.

ULRYCH: Or you chose the wrong market. But […] when you had a situation where you were ahead of your time, I suspect you stuck with that a lot longer, because, fundamentally, it seemed to make sense. Well how did you know when to get out quickly? Maybe I should ask that question.

FIALKOV: I would say my partner was better than I at that. Bob Brill, my partner in Newlight, [and] Shelly Harrison. People get involved with the companies they're involved in. I mean, my former boss at General Instrument told me that I was crazy to keep going with Standard Microsystems. He said, "Get out."

ULRYCH: So, in essence, you knew that that was going to be a success.

FIALKOV: Well, I felt…yes, something unusual. […] When it's time to get out very fast is when you find out you're in bed with bad people.

BROCK: Yes.

ULRYCH: […] Like Murphy.

FIALKOV: Like Murphy, or Richard Adler. If they're bad people, people do strange things…. There's a guy that—a smart guy I told you—became the dean of the business school, who just kept growing the business that ran out of money.

ULRYCH: Was that a venture you got out of very quickly?

FIALKOV: The banks put me out. That was twenty years ago. That's when I thought I was dying of cancer and he came to visit me in the hospital. […] Just pay his respects before I went. I had stomach cancer and I was in the hospital with a tube up my nose. They were feeding blood to me, which I had lost, in order to be able to operate. I was in the hospital for, I guess, three and a half weeks, two weeks to prepare me for surgery, and then a week and a half [afterwards]. The success rate is around 5 percent.

ULRYCH: Wow.

BROCK: Not a good number.

FIALKOV: No. [It has been] twenty-one years [since]. So, the unfortunate part of living to this age is lots of funerals, lots of memorials, lots of guys gone.

ULRYCH: Well, and a lot of people…lot less people to know.

BROCK: It is very interesting how much of the investment story, though, is about people, as we've talked about earlier […].

FIALKOV: Ask Arthur Rock. He'll tell you it's all about people. You have to invest in people who you know […] will never give up, who will work all kinds of hours, will forego vacations, will have only one thing—got to succeed in the business. And people give up. We had a business also, a very good software business (trying to remember the name) that was making money hand over fist, and, also, their major customers were banks. The bubble burst and the banks weren't making any investments anymore. So, their backlog disappeared, but they were left with a lot of cash at a time where cash is king, and a very good chief executive. The board was made up of the preferred shareholders [who] just decided to dissolve the company instead of keep going and look for a way of deploying that cash at a time when you had a great executive. […] I was not on that board; my partner Bob Brill was on the board. He was one of the preferred investors and they dissolved the company, took the cash for the preferred holders. The chief executives went out and found another business and I made a lot of money on that. But that company never should have been dissolved.

ULRYCH: Did your partner vote for dissolution or was he one of those voices against it?

FIALKOV: I don't know. I was very unhappy, because I had a personal investment in the company. But, he said I had a conflict of interest. Stupid. Cash was king then, and they had it, and they had management. You don't dissolve it.

ULRYCH: So, that's the main thing that keeps you sticking with the companies. […] You have so much confidence in the management that somehow, unless there's a fundamental problem…

FIALKOV: Yes, the people at Intel are good people. Fantastic backgrounds. But it's a tough, tough business. Nothing's easy. But I'm pretty sure that'll succeed. I'm trying to interpret the Hebrew message on this. I understand the Latin message, *Lux et Veritas*. That's light and truth, but I can't interpret the Hebrew message. Must have something to do with *Lux et Veritas*.

ULRYCH: One would think […] so.

FIALKOV: Yes. But it doesn't make sense to me.

BROCK: Well, maybe I'll switch this off. We can talk about our next steps.

[END OF AUDIO, FILE 4.2]

[END OF INTERVIEW]

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