



Oral History of Pierre Lamond

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Recorded June 30, 2017
Mountain View, CA

CHM Reference number: X8254.2017

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Fairbairn: All right. It is June 30, 2017. I'm Doug Fairbairn. I'm here with Pierre Lamond to do his oral history. Thank you very much for joining us. We appreciate that very, very much. Pierre, in these oral histories, we like to go back to the very beginning, where you born, what your experiences were growing up, whether your parents or siblings might have had a significant influence in terms of the path that you chose, your education and then on into your career activities. So, I understand you were born in France? Tell me -- tell me about that time.

Lamond: Well, I was born in Paris, 1930 . I went to high school in Paris. I went to engineering school in Toulouse, where I graduated with a degree in electrical engineering. And simultaneously, I did a degree in physics. And then, I was drafted in the French army, part of the military service.

Fairbairn: Okay. Before we go on to that. I'd like to explore those earlier days. So, you grew up in Paris? Is that--

Lamond: Yes,

Fairbairn: And did you have siblings?

Lamond: Yeah, I have a brother, ten years younger than me. And he had no influence on me and I don't think I had any influence on him. He became an oral surgeon, which is a little bit far away from my field.

In France, there's a great emphasis in high school on math and sciences in general, and I happened to be pretty good in math. And it's typical if you're good in math you become an engineer. When I was young, I was playing with at that time vacuum tubes and building a small radio that never worked very well. Actually, very noisy. So, I was interested in electronics and I chose to go to a school that focused on electronics.

There were, at that time, only two schools, engineering schools, in France that focused on electronics. One was in Grenoble. The other one was in Toulouse. This is a very different system than the United States. If you go to university in France, you study physics or chemistry or literature, whatever. If you want to be an engineer, you go to one of the so-called high school of engineering, translating from the French, haute école. And so, there is Polytechnique that everybody knows of, which means-- really means what it is. It's poly or multiple technologies, plus a couple of mining schools, a school of aerospace, a school of chemical engineering. And there were at that time 2 schools focusing on electronics-- this is in the '50s. I

got into school in '50. And at the school I went to, just like the one in Grenoble, I had to study power, electrical engineering, hydraulics, because there was also a possibility of going into building dams, and electronics. So, there was not that much focus on electronics.

Fairbairn: Before we go into that, so I'm still curious about your growing up in Paris. So, you were in Paris during the occupation and during World War 2. Was that-- what effect did that have?

Lamond: That was not a fun time. Let me put it that way. It was very tough. But I'm the proof that you can survive. No, it was a very difficult time and I survived.

Fairbairn: What were your parents doing?

Lamond: My father was a salesman and my mother was at home. And we don't have much to eat and things like this, but we survived, as I said.

Fairbairn: You survived. Did you develop an interest in electronics early on? Were you doing any projects or hobbies or anything like that?

Lamond: Well, I developed an interest in electronics, mainly radios at that time, because we used to listen to Radio France Libre, Radio Free French from London. This was under General de Gaulle. It was highly illegal, I can assure you to listen to that. And so, I was always feeling why it would be nice, if we could get radios with less noise. I mean it was a very noisy signal. And so, I was always interested in electronics. But it's only after the war that I could get a kit to try and build. At that time, I was 15 when the war ended. And so, I started playing-- there's no other word than that. I was sort of trying my way around building a radio. And as I said, I built a radio that the performance was not satisfactory. I won't lie about it.

Fairbairn: How did that <inaudible>?

Lamond: I was interested in engineering school even though there was not much emphasis on electronics. This is the area where I really studied. Because the rest of it, power transmission and things of this type, well, were not of interest to me. Many of the people that graduate from these schools end up working for the electrical utility and so on and so forth. But that was not at all my interest. And there was one interesting thing that happened to me. In the last year of school, I was studying vacuum tubes. And my professor, I remember his name. I don't remember many names, but I remember his name. His name was Nougaro. And at the end of the class, he said, "I've heard of an invention called a transistor." Now, you'll recall a transistor was invented, I think, 1947.

Fairbairn: '47-48, yeah.

Lamond: '48. And now we are in 1953. And he said, "I think that that's going to replace vacuum tubes." And that stuck in my mind. And when I got into the army, I bought a book-- I spoke English, by the way. I should mention that by the time I was nine, I spoke English. So, I bought a book written by a fellow named Shockley . I think the title was "Electrons and Holes." And as I had a lot of free time in the army, I read it.

Fairbairn: So, you were drafted into the army after university?

Lamond: Oh yeah. I was deferred. And so, I got into the army in '54. Not by choice, but it was during the time of war in Algeria. The French was fighting to keep Algeria French. So, instead of staying in the army for 18 months, they kept the draftees in for nearly three years. So, I escaped from the army in late '57. But that fellow, Professor Nougaro had a big influence on what happened to me.

Fairbairn: So, you read Shockley's book?

Lamond: Yeah. And I got more and more interested in that field. So, I also taught myself some solid-state physics, which I had not taken during my physics degree. And in the army, I became an interpreter, because there were not many people that spoke English fluently and I also speak Italian. And so, I was an interpreter from English into French.

Fairbairn: Now, how did you-- did you take courses in English? You just--

Lamond: No, my mother had some family in England. And so, for a number of years, I spent a lot of time in England, which I frankly did not like very much, because I didn't like the food and-- but I learned English, though. So, by the time I was nine, I was pretty fluent and my mother spoke English.

Fairbairn: I see.

Lamond: So, I was pretty fluent in English, actually. I mean I couldn't say that I could go to England and they would think I was English. But I was-- I understood very well. I spoke fluently and I could translate. So, it's rare that the army understands. I don't have much respect for the army in general. But, anyway, they discovered that I spoke English. And they needed translators. Because at that time, NATO was headquartered in Fontainebleau near Paris. And French officers did not speak English. And so, I had the privilege of dealing with a bunch of colonels and generals and whatever translating from English. I was a simultaneous translator, so I would go from one language to the other. And I was working side by side

with an American that was doing French into English. And he said, "With all the degrees you have," and I'm quoting here-- he ended up, by the way, being a professor of French at Rutgers. But, anyway, he said, "Why won't you go to the states. They are looking for engineers there." I thought it was a great idea. And he helped me get an interview with a company called Transitron.

Fairbairn: Yeah, I have some questions about that.

Lamond: So, Transitron was recruiting engineers in Europe. There was at that time, actually, something they called in England a brain drain, where American companies would hire English engineers. So, he placed an ad in the New York Times that in fact that they were going to recruit in France. And I got an interview. This was early '57. I had an interview and I went to the Hotel Georges V. I don't know if you know where the Hotel Georges V is, but it is one of the luxury hotels--

Fairbairn: The very finest.

Lamond: To tell you the truth, I had never set foot in in Georges V before that. And I met a fellow named David Bakalar, who was the president and CEO of Transitron. He interviewed me for one hour and made me an offer on the spot, which I accepted very shortly thereafter. And because I had been looking-- I should go back a bit. I had been looking for any companies in France that were working in semiconductors. And I found out that there were, but they were way behind the U.S. And I was attracted by doing research and development in semiconductors. So, I wrote off this-- I got an offer from one of them. Also got an offer from Schlumberger, the oil exploration company, because they were desperate to hire engineers that spoke English. But I did not want to go to Saudi Arabia. So, it was an easy turn down. And so, I accepted the offer from David Bakalar. And when I left the army, I applied for a visa, which I got in three weeks. And I came here on October 14 in 1957 to work for Transitron.

And I got a shock when I got to the States. I landed in Boston and the first person I talked to was a black guy that had a strong southern accent and I couldn't understand him. So, I thought, "Well, here I am. I think I speak English, but they speak a different language." But anyway, I started working at Transitron in '57. And my first job was to work on a production line under a fellow name Vladimir Chernichov who was Yugoslav and spoke English with a strong accent, where Ws were Vs and Vs were Ws. I had a tough time understanding him, but I'd been there but a few weeks, working on the production. The idea was that I would be training on the production line for a while and then go into development. And he left to go to Nevada to get a divorce. At that time in Massachusetts, you could not get a divorce unless you could prove adultery. And he had a problem with his wife, and he had to go to establish residence in Nevada, so he could divorce her.

So, I found myself with basically no experience, running a production line with mostly women, except the foremen who were men. And the women were mostly Portuguese, wives of Portuguese fishermen. So, I

needed to go through the supervisor, who spoke some English, to get things done. I really had an experience. But I learned a lot about how to make the transistors they were making at that time, which were grown-junction transistors, silicon grown-junction transistors. And then, after maybe four months or so, I moved to development.

And then, I found out something that bothered me. That was that American engineers with the same background as mine were making \$6,000 a year and I was making \$5,000. So, because I was sort of brash, I went to David Bakalar, the CEO, and I said, "Why is that? If you don't raise me to \$6,000, I'm going back to France." So, I got a raise of a thousand dollars. One thousand dollars at that time made a difference. And I went in development. I worked for a fellow named David Navon. I worked in development of transistors. And at that time, we were going from grown-junction to mesa transistors. And so, I developed that, and I moved up very quickly in the development group.

And after a while, I was running most of development. I had about 35 engineers working for me. I had a very quick rise. Because when you think about it, I had maybe a year and a half, two years' experience and all of a sudden, I've got a bunch of engineers working for me. I was pretty good then -- in that field. And--

Fairbairn: So, were the engineers trained in solid state physics and things before or are they all--

Lamond: And that's one advantage I had. I was one of the few engineers that knew something about electronics, and knew also about how transistors really work. Because, as I said, I had read Shockley's book and studied it, really. So, I understood the whole idea of minority carriers, and doping levels and the emitter vs. the collector, and how important is it to have an abrupt junction, and things of this type. So, that helped. What also helped is I understood-- I had a good feeling about what was manufacturable and what was not. And so, I worked on development. I also worked on developing a solar cell under a Signal Corps contract. And I made a solar cell that was one centimeter by two centimeters and achieved eight percent efficiency.

Fairbairn: Your history in solar cells goes a long way back.

Lamond: Yeah. And, actually, I got a patent on that. Not on the solar cell itself, but on the fact I used anti-reflection coating. This is where my background in physics helped. I said, "If we put a thin film of a quarter wavelength, which is not that difficult to do, you can improve the efficiency of the cell by quite a bit. And we got about a two percent improvement in efficiency. And so, I also did some work on epitaxy and I also tried to develop a high-powered transistor -- and not successfully, I have to say. And things were going pretty well. I became Director of Development. And I was advancing. And then, sometime in late '60 at the ISSCC conference, I gave a paper. And I have to admit I don't remember on what subject.

Fairbairn: In Philadelphia or...?

Lamond: In Philadelphia, right. Exactly. And a couple of days later, I got a call from Fairchild, where Gordon Moore wanted me to come and work for him. Now, sometime before that-- I don't remember exactly when Fairchild introduced the planar technology. I think it was somewhere around 1959-1960 that Jean Hoerni developed the idea of a planar transistor. And I had gone back to David Bakalar, my boss, and I said, "This idea that Fairchild has developed, that's the future. Because these mesa transistors are not very robust to start with, and the yield is not very good. But I think planar technology is the wave of the future." And his response was, "We have plenty of time to develop that. Let's stick to mesa and then we will second source Fairchild."

I said, "You're making a mistake. Developing this planar technology is going to take time. You have to develop an oxide based-- oxide masking based technology in terms of doping and so on and so forth." I said, "It's pretty-- I think it's pretty difficult, and we should start working on this right now." And we sort of broke up on that. I got really upset that here I'm in charge of development and he tells me, "We don't need it." They were very concerned about maintaining high margins. You probably know that, but in 1961, Texas Instrument was the number one company in semiconductor in the United States and Transitron was number two. And they <inaudible>--

Fairbairn: The first one was-- TI was first?

Lamond: Oh, yeah. TI was number one.

Fairbairn: Right and Transitron number two, right.

Lamond: I'm talking about semiconductor companies. I mean, there were a lot of manufacturers. I mean, RCA, Sylvania, there were a lot of people making semiconductors. But for semiconductors, Texas really was number one. Transitron was number two. And they were planning on going public, which they did a little bit after I left. Because I left Transitron in maybe April or May of '61 to join Fairchild.

Fairbairn: Okay, so before you get onto that, I want to talk more about Transitron. We actually did an oral history with David Bakalar. And one of the things that he commented on was that he had a hard competing with-- for people, for recruits with companies on the West coast like Fairchild. And he specifically said he started recruiting from Europe, of which you are a perfect example, because that's where he could have a better chance of recruiting engineers. And, in fact, as you say, they were a leading manufacturer of semiconductors in '60-61. Yet they were not able to maintain their position, obviously. And so, from sort both a management and technology point of view, and also from a location point of view, one of the things that we talk about here a lot is the question of what makes Silicon Valley Silicon

Valley? And why is it successful and not other places? And Transitron was a great example of a company that had an early start. They started in '52 or '54 and were a leading--

Lamond: '54.

Fairbairn: --position. '54? And were in a leading position in 1960. Why were they the winner or a winner as opposed to Fairchild? And I was just curious as to was it management? Was it location? What was the--

Lamond: Well, I don't think that David Bakalar was historically accurate. Because he recruited me in late '56. Fairchild was nowhere to be seen then. Fairchild started in--

Fairbairn: Well, in fact, I was going to say they, the people, the traitorous 8, they left Shockley on about the day that you landed in Boston.

Lamond: That's exactly right. So, that's about right. So, the story that he went recruiting in Europe, because he had competition from the East coast, that is not-- West coast, that is not correct.

Fairbairn: Well, perhaps later on, yeah.

Lamond: There were two things. First of all, there was a real lack of engineering talent in the United States, and not enough engineers. And so, that was one reason to go to Europe. But the real reason is that he could pay European engineers less than--

Fairbairn: Less money.

Lamond: --he would pay American engineer. That was the real reason. And I was a brash one and I went and I said, "I want the same money." But I can tell you, there was a fellow that came from Scotland that was hired in the same time I did. He actually went back to Scotland. There were a number of us, so to speak, expatriates working at Transitron and he was taking advantage of most of them.

Fairbairn: Okay. Well, that's good to know. That's why--

Lamond: Well--

Fairbairn: --we do all the oral histories.

Lamond: The issue that really made Transitron a failure eventually was that he had a second source mentality. He wanted to wait until somebody else did it and then do it.

Fairbairn: I see.

Lamond: Because, let's face it, he came from Bell Labs and he translated Bell Lab technology into Transitron. That's a nice way to put it. And so, he much preferred to be a follower than a leader. And his brother, who was a financial guy, had no technology background at all, but was very, very interested in getting the highest possible profit margin, so that they could go public at a high valuation.

Fairbairn: I see.

Lamond: I mean don't misunderstand me. I liked David Bakalar and I think he was an entrepreneur and PhD from MIT, as you probably know. Very smart, but risk averse. And when you run development and you work for a boss that's risk averse, that's pretty tough. And so, when I got this call from Fairchild, it took me a few microseconds to decide I wanted to do it.

Fairbairn: Had you been tracking what Fairchild and others were doing? Were you very aware of what--

Lamond: Absolutely. I was absolutely aware of what others were doing. I was aware of what-- there were a number of companies at that time that were still feeling that germanium would be better than silicon -- the Sylvania's of this world. So, it was-- the rate of development was extremely fast when you think about it. Shortly after Fairchild did the first planar transistors, they were already thinking about what became the first integrated circuits.

Fairbairn: Exactly.

Lamond: So, people think that there is a tremendous acceleration right now. Believe me, it wasn't slow at that time. But when I was at Transitron, by the way, I decided after I'd been there a couple of years that I would see if I could go back to France. And I took a trip there. By then, I was married and my wife would have preferred to live in France. So, I went there and looked to see if I could get a job. At that time, I was probably something like 29, and I interviewed with a couple of French companies that then had started to make semiconductors. And I talked to them and their response was, "You're a bit young to be head of a lab. By the time you turn 45, then we'll give you that type of responsibility." So, I thought, "Well, that's not going to work." And not only one company, a couple of them. So, I went back to the States, convinced that I would stay there a while longer. So, when I left to go to Fairchild in '61, my thinking was, first of all, it's nice to live in California for a while, because I didn't like the winters in Boston. And secondly, I'll go there until maybe 1965 and then I'll come back with a real knowledge of technology. I can go back to

France and I may be able to write my own contract. But that never happened, because I joined Fairchild and I was working for--

Fairbairn: So, you were recruited by Gordon Moore and--

Lamond: Yeah, he interviewed me, yeah.

Fairbairn: What position did you come into?

Lamond: Well, member of the technical staff in R&D-- but then, I worked for a fellow with another name I forget now, Furgeson. And a few weeks after I joined, he decided to leave to start-- I think it was Signetics he started. He was a-- did you interview Furgeson? [Ed: Phil Furgeson was one of the founders of General Microelectronics. See his oral history in CHM's collection]

Fairbairn: No, I don't think so. Possibly somebody else, but I don't remember.

Lamond: Yeah, I think that he started-- he was one of the founders -- one of those "Fairchildren" companies. And Gordon promoted me to run development. Actually, for a while, I worked under Vic Grinich. And then, I worked directly for Gordon. And I ran device development, which at that time was more planar geometries, the beginning of integrated circuits. We were doing RTL, and trying to make a PNP planar transistor, which at that time we didn't understand was very difficult to do. NPN was easy, but PNP was difficult. And I happened to be sitting in the office that Bob Noyce used to have. So, I was able to look at Bob Noyce's notebook. And in the early days of Fairchild, they first tried to do a PNP configuration, and they had major problems. Turns out that leakage current is due to sodium contamination. And so, then they moved to NPN. And it's sort of interesting, because if they had never moved to NPN, they might not have been successful, but--

Fairbairn: So, this is all <inaudible>.

Lamond: This was before my time. And so, we were making all sorts of NPN transistors. We were trying to work in two areas, increase the power, or increase the ft, the frequency of operation. And so, I was running that. And then--

Fairbairn: So, this was all bipolar work, there's no--

Lamond: Oh, no, no. Then towards the-- I stayed under Gordon for about 4 years-- I stayed at Fairchild for a total of about six years plus. I started in '61 and I left in '67. And towards the end, we were starting to work on MOS. But I lost the train of my thoughts here.

Fairbairn: You were going-- I'm sorry for interrupting. You were going to NPN. You said they were successful, because--

Lamond: Yeah, and we were focusing on that and we were trying to go to higher frequency and also higher power. And then, we had at Fairchild something that sounded like Fairchild University. But on Thursday mornings, other people must have told you that, we had classes for new recruits. So, Chih-Tang Sah, who was at that time at Fairchild, would teach solid state physics. Gordon Moore would teach processing, and I would teach transistor electronics.

I will tell you a story, because it's sort of funny. One of my students at one point was a fellow named Andy Grove. At the end of the class, it was maybe ten lectures or something like that, he goes, "We could--" there was no teaching of semiconductors in most schools. And Andy graduated with a degree in fluid mechanics. So, anyhow, in the class I would give them an assignment to design a transistor with this type of performance, break down voltage, ft and so on and so forth. And then, they would give it to me and I would not grade it, but criticize it.

Fairbairn: Give them feedback.

Lamond: Yeah, give them feedback. I had never any intention of putting these things into production, because my job was to develop a process and a transistor and move it over to production. And I didn't put Andy Grove's transistor into production, which he did not like. Many, many years later, in the early, maybe late 90's, Andy was chairman of the UCSF campaign to fund what is now Mission Bay. And my wife was on the board of trustees of UCSF. So, we get invited to a launch dinner and she ends up sitting next to Andy. You know what Andy's first comment was? "When I was at Fairchild, I designed a transistor and Pierre refused to put it in production." That was his first comment to my wife.

Fairbairn: He's still angry.

Lamond: Which I thought, I mean, this is 30 years ago.

Fairbairn: He'd been waiting 30 years to take that off his chest.

Lamond: He still remembered that. I thought it was quite funny. But anyway, Fairchild was a great laboratory for training people in many respects. And one of the reasons why there are so many companies that ended up coming out of Fairchild, it was a fantastic training ground. And it was at the leading edge of the technology. It was, for quite a while, very aggressive in terms of introducing new things, new products, new ideas on the marketplace. So, it was a great place to work, no question about it. And working for Gordon was fantastic, because he's great technically, but he's a very easy boss. And I saw him, actually, a year or so ago at a function for the Monterey Aquarium and he's really a great guy. No question about that. And one of the things I like about him is that he's modest.

Fairbairn: Yes, he is.

Lamond: I mean, he doesn't boast about anything. When you talk to him about Moore's Law, he said they claim I invented the exponential. I mean this type of things. But anyway, I introduced a device, a very high-speed transistor into production. And we got a very big order from a company called Control Data. There was a fellow named Seymour Cray that was working-- was there. <laughter> And he wanted to build what was then the first supercomputer, you might say? And he wanted to use that transistor, which I think was a 2N709 or something like that. And I transferred it to Production. Production couldn't make it. So Bob Noyce, went to my office and said, "Pierre, you did a great job in developing these transistors, but we can't make it. And we got this big order, 600,000 transistors to make, to put in one machine from this company called Control Data. We need to deliver. I want you to move to Production and help out the production of this device." And this is how I moved from Development to Production. And frankly, in one respect, you know, it made sense. Here I was, you know I had basically the equivalent of a MSEE degree, and I had a bunch of PhDs working for me that wanted to do the next new thing. And so it made sense for me, and I thought to move to Production. So I ran the production line making these high-speed transistors. And I had some problems with my boss. I didn't think he was very good. And as I've told you, I was sort of brash, so I went to my boss's boss. At that time it was Charlie Sporck, and I said, "You know, I can't go on working for this guy. He doesn't know what he's talking about. He's a manufacturing guy, but he has no experience in transistors or in transistor manufacturing. Or semiconductor manufacturing. I just can't work with him." So I hate to say it, but I managed to get my boss fired, and I replaced him. So I went to manufacturing, what is now called, you know, the wafer fab. And I did that for a while.

Fairbairn: So did you get this transistor into volume production?

Lamond: Yes, I got it in volume production, and it was a big contributor to profitability of the company. But there was another thing that was growing on the side. There was integrated circuits. The RTL family of devices. And so I was moved from Manufacturing to running-- they made it into a Division. Running the Integrated Circuit Division. And that was-- must have been 1964. And that division grew like crazy. In '65, I think we hit about \$45 million worth of business with a gross margin that was obscene, 75 percent type of gross margin. It was the most profitable Division of Fairchild Camera and Instrument <laughter> of the whole parent company.

Fairbairn: Right.

Lamond: But then in '66, I started to become antsy. Here I was running this division. It did \$45 million in '66. And I went to Charlie Sporck, and I said, "You know, I enjoy what I'm doing. It's very satisfying, but here I am, I have a thousand shares of options. I'm minding a \$45 million business, generating \$20 million dollar pretax. I don't feel I'm being rewarded properly. So I'm thinking of starting a company." And this will tell you how naïve I was at the time. You know, I went to my boss to tell him I was planning to leave to start a company! <laughter> but I'd become very friendly with him, you know? Our family--

Fairbairn: This was '66?

Lamond: This was '66, yeah. You know, I had been approached by an English company called Plessey, They had a semiconductor operation in Swindon [England], and the company was run by a fellow named Clark, Sir John Clark. And he wanted to start a company in the United States. And you know, I was well-known enough that he approached me about maybe leaving Fairchild. And so a combination of things happened. I talked to Charlie about the fact that I plan on leaving. And I said, "You know, I have these people, and they have some money, and I could start a company here, and this is what I would really like to do."

Fairbairn: So you had seen a number of other people leave Fairchild, start companies, and so this was kind of--

Lamond: Yeah, exactly. And I was sort of, you know, as I said, I was sort of-- I knew him, I thought he was my friend. I said, "You know, this is what I plan on doing." And then things progressed, and we're going on. Then one day Charlie said, "You know, if you leave, I'll leave with you." And so he said, "Why don't you start recruiting a team, so we can start our company." And I was sort of-- you know, when I look back, I still think, "How did this happen?" It was sort of strange, right? And I go on talking to Clark at Plessey, and then he hired a lawyer from New York to help on negotiating the deal. And when the lawyer found out that I planned on having 50 percent of the company for the founders, he said, "Are you crazy?! No way!" So we're back down to ground zero. In the meantime, separately from that, there was a company, National Semiconductor that got started by people from Sperry. They were in Danbury, Connecticut, but then they acquired, if I remember correctly, Molectro based in Santa Clara, and I had lost two people to Molectro. One of them was David Talbert, and the other one was Bob Widlar, the inventor, really, of analog integrated circuits. And they, Bob Widlar and Dave Talbert went to Peter Sprague, and told him, "You should hire Charlie Sporck to run National Semiconductor." So Peter Sprague-- this is the way I remember it--

Fairbairn: Peter Sprague was the Chairman--

Lamond: He was the Chairman of National, he invested in National when National was in really deep trouble. It was running about nine or ten million dollars in revenue, was being sued by Sperry. And Peter Sprague, you know, he had lots of money as a young man, because his father had died, and he was part of the Sprague family, and he was getting advice to invest his money, and he became the major investor in National. And so Dave Talbert and Bob Widlar went to him, because National had acquired Molectro, and they were part of it, "Why don't you hire Charlie Sporck to run the company, because these guys from Sperry are not very good." So all of a sudden, Charlie negotiated with Peter Sprague, and we joined National. In the meantime, I had recruited a few people to come with me. One of them was Roger Smullen, one of them was Floyd Kvamme. Charlie recruited Don Valentine. Floyd Kvamme at that time was marketing manager at Fairchild for integrated circuits. And Don Valentine was in charge of sales. And I was--

Fairbairn: So you'd had a bunch of side conversations and said you were thinking of leaving--

Fairbairn: Yeah, a side conversation. The whole team came from Fairchild. A fellow named Ken Moyle , who was actually an MOS guy. And there was somebody else (Fred Bialek). And obviously, I knew Bob Widlar, because he had worked for me. And I knew Dave Talbert, because he had worked for me, too. So we put all this group together, and this is the way we started National.

Fairbairn: And you moved it out here to Silicon Valley from Danbury, Connecticut.

Lamond: No, no, they were here at Molectro

Fairbairn: Oh, they were here, oh, because they were North--

Lamond: Dave Talbert and Bob Widlar were at Fairchild. It was a big loss when I lost them, because I will tell you, over all the years, and I've been in business for a long time, Dave Widlar is probably the best engineer I ever worked with. He was unbelievable! Very inventive, extremely thorough. And leaving no stone unturned. I mean, when he developed a product-- I'm talking integrated circuits. When he developed a product, he really developed it, including application notes, an incredible engineer. Unfortunately, major problem with alcohol. But incredible! I mean, every product he ever developed was successful. We can't say that of many people. So, we moved on to National, which at that time, believe it or not, was a public company. Even though it had ten million dollars in revenue, and the stock was trading over the counter for I think three dollars. When it became public that we joined the company, it jumped to twelve, and we raised a lot of money. We sold stock in a secondary offering -- we raised \$3M. At that time, that was enough to equip a fab to make integrated circuits. It didn't cost that much money. And we took over National. And one of my first duties was to cut the cost in Danbury where we were making transistors and things of this type.

Fairbairn: So they had a transistor fab in Danbury?

Lamond: Exactly, yeah. Did you interview anybody from these early days at National?

Fairbairn: Well, Charlie, himself. I don't know if we have any of the others.

Lamond: Yeah. Danbury was a mess.

Hancock: Floyd.

Fairbairn: Oh, Floyd, yeah.

Lamond: Ah, Floyd!

Fairbairn: Interviewed Floyd, yeah.

Lamond: Yeah. Yeah, I'll tell you-- I'll give you some in-- background on Floyd as well. <laughter> But Danbury was a mess. So, oh, yes, there was another fellow, part of the team, Fred Barlick [ph?], who had experience in manufacturing. He used to run the die plant for Fairchild. Very, very good manufacturing guy. Very tough. So he and I flew overnight on a Sunday night, we flew, arrived in Danbury on Monday morning. And we arbitrarily laid off one-third of the people. And I mean, it was arbitrary. Your name up-- I mean, we had to cut the cost, it was way, way over staffed. So we turned an operation that was losing money into an operation that was at least break even in a few months. And Danbury ended up reporting to Fred Barlick. I was running Integrated Circuits, he was running Transistors. Although, as you know, we didn't stay in the transistor business very long. But anyway, I joined Floyd Kvamme-- I had recruited him to become the marketing manager. And before I left Fairchild, I got a call from Bob Noyce trying to get me to stay. And I was very friendly with Bob. It was also a family, and we knew the families and so on and so forth. And I said, "No, I've decided to leave," and I told him why. And he says, "Okay, I understand." Although I have to tell you that sometime in 1965, Bob gave us a talk to the staff about the fact that there would be no more semiconductor companies started. Because it was now Fairchild, Motorola and Texas Instrument, the Big Three, just like they are the Big Three in automotive, Chrysler, Ford, and General Motors. And there will be no more companies started. That's to show you how you should never forecast the future! <laughter>

Fairbairn: He changed his mind a few years later.

Lamond: He changed his mind two years later, or three years later. But in some respects, you know, he was right. There was no venture capital. And my problem in wanting to leave Fairchild is that I could not find any-- there was no venture capital. I mean, after [Arthur] Rock, you know, I had started, I had financed, I had arranged the move to Shockley, but it was not venture. It was totally different. And you could not find-- you know, J.H. Whitney, they were in venture, but they're not interested in technology. They were interested in investing in TV stations and things of this type. So I could not find any venture capital. I had some connections on Wall Street, but they were useless. Bankers. I had connections with Goldman Sachs, but you know, they didn't do venture. So anyway, and the word probably did not exist then. So anyway, we are at National. We raised some money. And we get going.

Fairbairn: So what was the plan? What was the strategy in terms of the--

Lamond: The plan was we were not going to do RTL or DTL or whatever. We were going to go and compete on the digital side with TI, which at that time was making transistor, transistor logic, TTL.

Fairbairn: TTL.

Lamond: Which had major advantages over DTL or RTL. And we approached it from a very interesting point of view. Instead, you know, normally you compete and you say, "Well, we're going to make the simple devices first and then we'll move on to more." Instead of that, we went the other way around. And while there were a lot of sales of dual input gates and simple things like this, we went into comp-- what at that time, were complex circuits like, you know, decade counters, or multiple quad-flipflops. I don't remember exactly, but we went to the high end, because we thought, "There's more demand there. The average selling price is much higher. The cost is not that different. And we will-- we can fight TI that way." And it was a great strategy from a product point of view. The other great strategy in my opinion, something-- did you interview Don Valentine?

Fairbairn: Yes. Part way anyway.

Lamond: One of the things that I give credit to Don is to say, "We don't really need-- because the normal thing would have to be you hire ten/twelve salesmen." His idea, very smart, now everybody does it, reps. So he would go to the best salesmen from Texas Instrument in a particular territory, let's say Boston, and tell him, "Why don't you start to rep for-- and I will help you. I'll give you-- you can sell National Semiconductor product, and I'll help you getting some other lines." And so he helped develop a whole network of reps, including in the Bay Area and everywhere else, and so we did not have the cost of having to hire salespeople that sell very little at the beginning. We gave up some of our profit by giving a commission to these reps, but it was, at that time, a revolutionary idea. And Don was a really great salesman! And he helped us considerably from that point of view quickly sell, because we needed to sell quickly.

Fairbairn: So were you responsible for getting the wafer fab up, and--

Lamond: I'm sorry.

Fairbairn: What were your responsibilities going into National?

Lamond: Well, I was running everything in Santa Clara.

Fairbairn: Okay, so development as well as manufacturing.

Lamond: Yeah, everything, yeah, I was running everything, yeah. I was the General Manager, everything. I had Development, whatever that was, because it was not big. I had Production.

Fairbairn: So you had somebody bringing up the wafer fab and--

Lamond: Everything, yeah.

Fairbairn: Right.

Lamond: And then we quickly-- and I forget which year, but we quickly established an assembly facility in Hong Kong. I think it was maybe two years after we got started, like, you know, '68, early '68. We went to the flat in Hong Kong and started assembling parts in Hong Kong. And that was the beginning of what the National turned out to excel in, production, manufacturing capabilities. We were by far the best manufacturer of semiconductors for a long, long time. Eventually, you know, everything turned to-- eventually you get the-- you have same thought, and everybody gets on the same level. But for a long time, our manufacturing efficiency, or manufacturing costs, were a lot less than anybody else. And I think it was in '67/'68, because that's the first time I went to Hong Kong, it was to visit the plant. I mean, the flat where we were assembling. So we did two things. We tried to attack the market from the high end as opposed to the low. Eventually, we also made simpler devices. But also, we focused a lot on cost at all levels. And, you know, things were not easy. Because, for instance, there were not available integrated circuit testers in the market place -- on the market. And Fairchild had their own-- because they had Fairchild instrumentation, and they refused to sell to us-- it's sort of interesting. They finally woke up to the fact that we had left with some of their key people but we were not sued. But they refused to sell us anything. So I met a fellow named Alex d'Arbeloff, who had started a company in Boston called Teradyne. And his co-founder was a fellow that I had met-- his last name is Wolf, a fellow that I had met when I was at Transitron. So he contacted me and said, "We're developing a tester for integrated circuits." I was his first customer. It was not easy, because until then we didn't have a real high-speed tester, so we were

testing these devices basically on jigs, you know? It was very inefficient. By the way, we ended up still testing analog circuits for a long time, you know, one test station after another because there were no testers for analog circuits.

Fairbairn: So you were-- National, then, already had analog circuits that Widlar had developed, or--

Lamond: They had not launched them yet.

Fairbairn: Oh, they hadn't launched them yet.

Lamond: And that was one of the reasons they wanted Charlie to join, because they had a lot of problems getting things done! They had a fab, which was not directed to making integrated circuits. So the reason we raised some money is to buy the right furnaces, and the right alignment tools and things like this to make integrated circuits. But you know, it was really hands-on. Like I called there and one of the first things I did was to set up the furnaces. Horace Mond [ph?] and I would, you know, put the gas lines together, and I'll always remember that we were using arsine to get arsenic to-- which is an antidopant. And the way we found out it was working, we would smell to see. Do we have any-- tastes like garlic? It smells-- could see if there was any flow. It was, you know, <laughter> it's probably the reason I'm living so long is I got some arsenic! No, it was really hands-on. Everybody was working very hard. I mean, I-- for the first three years or so we had an all-hands onboard on the last week of the months to help shipment. And there was a famous story about me that you probably have hears. One day-- this is in the early days of National-- I used to always get there at seven o'clock in the morning, and the famous, you know, management-by-walking [around]. I didn't know that existed, but that's what I did. I would go through everything first thing in the morning. And I'd go to the shipping dock, and I see a guy sitting there reading a newspaper. I go to him and I say, "You're fired." He was working for Pacific Bell. <laughter> You ever heard the story?

Fairbairn: No!

Lamond: Because a lot of people knew the story, and would tell it in a different way. That's the real story! I was walking there. I see somebody reading a newspaper <laughs>, "Not on my time!" So I had a few things of this type. Don't believe everything you hear. The other one in 197--

Fairbairn: How did he respond when you said he was fired?

Lamond: No, he said, "I work for Pac-Bell," and so-- the other story that's sort of funny in the early days of 1971, was not a good year from an economics point of view. So I was cutting costs like crazy! And I decided to stop mowing the lawns on what is called Semiconductor Way.

Fairbairn: Yeah, I did--

Lamond: And so Bob Widlar brought up a sheep. <laughter> You heard the story?

Fairbairn: I heard something about-- but go ahead, tell me.

Lamond: So he had a convertible car, and he put a sheep in it, and put it there, and attached it on the lawn so I could see it from my office.

Fairbairn: Right! <laughs>

Lamond: It's true! I mean, it's a true story. The only problem he didn't realize that nobody wanted to ride with him afterwards, because the car smelled so badly.

Fairbairn: <laughs>

Lamond: So there were a few things like this. But and we were growing pretty quickly at National. I think by 1970, we were about \$70M in revenue. Something like this. It sort of leveled down a little bit because of the recession. I said to myself, "Okay, I've worked for Charlie Sporck long enough, and I need to run my own company." And I got an offer from a company called Coherent. At that time it used to be called Coherent Radiation, to run it, to become CEO. It was a laser company. I was very interested in laser, because when I'd done my degree in physics, I'd done a lot of work on optics. And I went there. It was a \$16M company losing money. So I turned it around, and then decided that lasers were really interesting from a physics point of view, but it was not a big business. It was a famous solution in search of a problem. Although some things happen. Like, you know, they did the first laser photo coagulator for people that have diabetic retinopathy, which is bleeding of the back of the eye. You use a laser-- the green light of argon to stop the bleeding. It sounded like an interesting product. My Marketing Manager, I asked him, "What do you think is the market?" He says, "Well, you know, maybe five or ten in the world." Well, I left the board of Coherent in 1985, they were selling many a month. There were a lot more people with diabetes-- so I was not too happy there. And Peter Sprague--

Fairbairn: What were the things that you did to turn the company around, and what steps had to be taken?

Lamond: I cut the cost. <laughter> There were no special things to be done, because it was not-- I mean, we were making carbon dioxide lasers for high power. We were making the argon lasers primarily for research. We were making helium neon lasers for red lights. We actually sold some of the first ones

through the early days of scanners. You know, the bar scanners. But you know, it was a business that was growing fairly slowly, and that didn't have the same energy that you had in semiconductors. But on the other hand Peter Sprague said, "You know, I'm an investor in a company in Boston that's developing projection TV." And I looked at the technology, I said, "Boy, this is interesting! And TVs is a big business, might be interesting." So I moved my family to Boston, and I stayed there for about a year running Advent. And Advent is a company making speakers. But the founder of Advent had developed this technology for high power projectors. It was made up of three tubes, you know, green, red and blue. And you may have seen it in airplanes. They used it as an invention of this company. But it became clear to me that we could not compete long-term with Japanese and all the established TV companies, because they would copy us. And sure enough, that was happening. So I had a difference of opinion with Peter Sprague. In the meantime, I'd stayed on the Board of National, because when I left, I ended up joining the Board of the Company. When I left National, I joined the Board. I was not on the Board before. And Charlie said, you know, "I need you back." I have a problem, I need you back." So I left Advent. I had a problem there that I later taught other people, "if you're going in in a company to turn it around, get rid of the CEO." I didn't. And I got there, and there was always a group plotting. So it was a politically bad situation. So I came back to National, and you know, the guy that used to publish that weekly letter there on a new Elec--

Fairbairn: Hoefler?

Lamond: Huh?

Fairbairn: Don Hoefler?

Lamond: Yeah. Wrote two articles in succeeding weeks. One said, "Bad news, Pierre's coming back to National. Is Charlie henchman going to do major layoffs?" The next, "And by the way, Floyd Kvamme is going to get it. He's going to get fired." The next week he says, "Great news! Pierre Lamond joined National. They desperately need somebody like him with his technical--," it was the perfect journalist type of thing. One week you said, "No," the next week, you say, "Yes," then anyway. <laughter>

Fairbairn: So what was the problem that Charlie wanted you to come back and address, or what was the situation?

Lamond: Oh, they had a major problem in development, major problem. They had fallen behind, and not investing enough, or investing in the wrong things. And I went there and I ran Advanced Product, you know, MOS and memories in the early days of the microprocessor and things like this. And I helped get the company back on track. But you know, I still had that urge to run my own company. And then Bob Swanson left, and he came to me, he was working for me. He was running the Linear Integrated Circuit Division Group. And he told me, you know, "The company's getting very big. Very bureaucratic." You

remember in 1960 or '60-- or I mean, not '60-- 1979, '80, or '81 National was close to a billion dollars or so. I mean, very close to that. "The company's becoming very bureaucratic, I'm not enjoying myself. I'm leaving to start a linear circuit company." And he took Bob Widlar with him. That was a big blow, but I had expected something like this, so I had hired somebody, Bob Dobkin-- to back up Widlar. So it was not that much of a blow to National, but it made me think. Do I really want to wait to stay here? Charlie's only three years older than me. He's not ready to retire. Am I going to go on doing this for the rest of my life? So I left. I told him I was leaving, and I left at the end-- middle of '81.

Fairbairn: So how long did you stay that second time you came back?

Lamond: Second time, I came back in '78, and left in '81. So I was gone from '76 to '7-- I was gone two years, basically.

Fairbairn: Did you feel you got the company back on track when you fixed the development?

Lamond: Yeah, but there was some major difference of opinion between Charlie and I. Sometime in-- we decided to get into the business of supplying memories for large computers, you know?

Fairbairn: Oh, yeah, memory systems?

Lamond: Compatible memories. And that was okay, because we could use defective memories, and you heard the story. So you could use defective memory [chips], and by putting all them together, you could offer memory at a very good price. But then from there, he decided to buy a company called Intel. And to get into the IBM-360 compatible mainframes. I started to feel that he was losing track of what the company was about, which is semiconductors. And Floyd Kvamme, by the way, was the one that was pushing going into systems. I thought it was a terrible mistake.

It was an even worse mistake when it was decided to second source the PDP series of-- I forget which number, but one of the PDPs of DEC. Now, DEC was my biggest customer on the semiconductor side, by a lot. And I got a call from DEC, I went there and they said, "<claps> "We don't want to do business with you anymore." So that really annoyed me! But Charlie and Floyd were moving hard on the direction of making computers to set up a plant in San Diego if I remember correctly, and I was just... I felt, you know, they also got into the business of making cash registers, that was under Fred Bialek. And I thought, "You know, this is a semiconductor company. And trying to compete with your own customers," we were then competing with NCR! "So it doesn't make sense." So there was a divergence there. And I thought, you know, "I'm too young to go through that." I mean, so I left with no plans. And I wasn't going to go anywhere.

I decided to do some consulting. And one of the guys that called me was Don Valentine, and he said, "I could really use your help on investments in semiconductors." At that time, he was thinking of investing in what became LSI Logic. So I was doing some consulting. I got a call from DEC, and I did some consulting for DEC on the semiconductor side. I did some consulting for Gould, because they used to own AMI. And I was looking to see what I wanted to do. And then Don got more and more of my time. And at one point in time, he said, "You know, I'm raising another fund. Why don't you join me as a partner, and then if you find a job somewhere, you can leave." So in '82, I-- mid-'82, he raised Sequoia Capital 3, I think it was. Yeah. And I joined him as a partner. And one of the first investments I ever made was a company called 3Com. It was started by a fellow named Metcalfe, Bob Metcalfe.

Hancock: Sure.

Lamond: Who is probably the inventor of the Ethernet. But anyway, I studied 3Com and the idea, you know, sounded pretty good to me. So we invested in the firm about \$500K. And I joined the Board, and how should I put it? It's a-- anyways, it was pretty evident to me that Bob was very bright, but was not a manager. This has happened to me more than once. So I told the Board, and there was Dick Kramlich on that Board, and another fellow, who's name I forget, but it was an ex-HP guy. And I said, you know, "3Com is a good company, but it's going nowhere with Metcalfe as CEO. So we need to find a-- we need to replace Bob Metcalfe." And so we did, we replaced Bob Metcalfe and the company did a lot better than with Bob. And it was a great investment. So I thought, "Venture is easy."

Lamond: You put money one day, and you clip the coupons the next day. <laughter> It turned out, it's not exactly the case. Because then I did another company that was not successful. But then I got involved over the years at Sequoia with a number of very successful semiconductor companies, because I really understood. So I was an investor in Cypress Semiconductor with T.J. Rogers. I was on the Board and Chairman for many, many years. I invested in '84-- no, '83, and I was on the Board until '97.

Then another successful, very successful semiconductor company is Microchip, that you may have heard of, which is in Phoenix, Arizona. That's another company where I had to change the CEO. We invested in Microchip, and we bought basically a division of GI, of General Instrument. They had to divest themselves. And we invested \$12M, or something like this, and we bought their semiconductor division. And the company was making EPROMs and we got sued by Intel-- rightly so, by the way, because we're infringing on their patents. And so all of a sudden, we make this investment, and we cannot sell EPROM in the United States. We can sell them outside the United States. But they also had a small group making a microcontroller called a PIC microcontroller. And so we shifted gear and went from making EPROMs only to focusing on the PIC microcontroller. And we were very successful with that. And that's what the company is doing now, and you know, it's a billion, multibillion dollar company. But there again, I had a problem with the CEO and I replaced him with a fellow named Steve Sanghi. I hired him from Intel.

And then the third one is a company called Mellanox, that is doing very well. It's about a five hundred million or seven hundred million dollar company. And that was my last major investment in semiconductors. I also invested in Vitesse, which was a company doing gallium arsenide, at first. All these were good investments in semiconductor sector. But in general, at Sequoia, I invested in companies, mostly in hardware, or hardware/software.

And you know, I was very involved in Cisco. We invested in Cisco, which was started by a husband and wife team, and they didn't have a VP Engineering. The husband was supposedly the VP Engineering. So Don Valentine went on the Board, and asked me to be the Acting VP Engineering. That was 1987, I think? No, no, '85. No, '87. And then I stayed on for a long time.

Hancock: And also became CFO, too! Right?

Lamond: Huh?

Hancock: Didn't you also play a role in the finance as well, in the financial side with Cisco, as well?

Lamond: Yeah, but that was not that difficult. The engineering was much more difficult, because we needed desperately to increase the number of engineers, and every time I hired an engineer, the wife-- I forget her name--

Hancock: Sandy--

Lamond: Would tell me, "This guy's brain-dead!" That was her favorite expression. I said, "You know, not everybody is brain-dead! Not everybody is as smart as you are! But I need engineers!" So, I hired engineers. I tried then to hire somebody to replace me. I made the wrong choice, so fired him. Then I got back into running engineering on a daily basis. You know, I was having two jobs, by the way. I was spending a day a week at Cisco, and four days a week at Sequoia. And then eventually, my third choice was the right one. But by that time, I had been running engineering for three years. So the company asked me to stay on, and do engineering reviews every month. And I did that until 1995. I got a nice plaque out of it, which says, "Virtual VP of Engineering." <laughter> But so I was involved-- I was deeply involved in that company.

More recently, you know in 2005, I was an investor in YouTube, but I was coaching at that time or mentoring Roelof Botha, so he went on the Board, and I was attending Board meetings. And I had a tough time with these two young guys, but you know, it turned out to be a great investment. I didn't have-- over the years, I didn't have any, you know, one of these crashing failures. I had some investments that

didn't work. I mean, I certainly did not bat a hundred percent. But I didn't have any major crashes where, you know, there's a company where we end up putting \$50M that goes belly-up.

Hancock: How do you explain that? You know, a lot of VCs talk about the sort of home-run style, where there are a few home runs, and some crashing fires. Some people say that it's intuitive, and it can't be taught, and others feel like there's a sort of a systematic method for choosing. How do you explain your success?

Lamond: Well, by and large it is intuitive. Because a lot of the success depend on the quality of the team. And when you meet people, and even though you've spent some time with them, it's only when you see them in action that you find out if they are really good managers or developers or whatever. And you know, the important thing in venture is to make sure you support the companies that are doing well, and you cut off quickly the ones that are not doing well.

Hancock: Can we talk more about your role with Cypress and with working with T.J.? Say a little bit more, because as an investor, you took a very active role in helping shape and build that company. Can you talk more about that?

Lamond: Yeah, that's both my strength and my weakness, I will admit. I tend to take an active role in the companies. You know, it's tough. When I first started to be a venture capitalist, I had a really tough time. It took me some time to realize that I was not in charge. The only thing I could do is, the word people use now, I could "nudge." I could nudge the CEO in one direction or another, but it doesn't work to tell him what to do.

Hancock: Were there some experiences or incidents that led to that insight for you and what your role is?

Lamond: It took me some time, because I was used to running a company or running a division. We'd have a staff meeting, I would listen to everybody and I would say, "This is what we're going to do." Now I sit in a room very often with people that technically don't understand what's going on. I mean, the Directors, and I know the CEO is making the wrong decision. Or is going in a wrong direction, at least from my point of view. Or he's not hiring the people of the quality that he should hire. He's willing to allow for below par performance.

The first three years, I've got to tell you, I was very frustrated that, you know. "I can't do it! I can't get them to do it!" It took me some time to realize that the best I could expect is people to listen to me. And then decide what they want to do, but you can't force a CEO to do something that he doesn't want to do.

With T.J. Rogers, who has a reputation to be a very tough guy--and he is--I have to say something about T.J.. He's a good listener. So he would disagree fiercely with me during a board meeting, but then he would come back two days later and says, "You know, I've thought about it some more, and you were right." Or he would say, "I'm not going to do that." I remember-- you've heard, I'm sure, of SPC, you know, Statistical Process Control. And I told him, in fact this is back in late '80s, I think it was. I said, "We have to institute SPC." And at first he fought me, and then he became a complete advocate of SPC and our company did very well in terms of improved quality, and so on and so forth.

So it depends on the individual, but I agree that you need to have intuition, but you also have to have knowledge. And the problem I see today in venture capital, by the way, is that too many investors that have no experience in a real company. I'm not saying you have to have 20 years' experience, but if you have a few years' experience maybe running an engineering team in a company, or maybe being the CEO of a company, independently of the size, it gives you-- it's experience that's required. And I sit on Boards these days where it's clear to me that none of these people sitting around the table with me have had any experience running anything.

And you know, it's one thing to run a company that, for instance, is in the internet field, where the only thing that's important is the number of eyes, or something like this. It's very different from when you work on a company that's making something, that needs to deliver a product. Be it hardware or software for that matter. And there is a change-- I mean, let's say early days of venture capital, '90s and early 2000, many, many venture capitalists had experience in industry.

Hancock: Sure.

Lamond: They had, you know--

Hancock: Extensive operating experience.

Lamond: They had experience. John Doerr, you know, had worked at Intel for five or six years. Most venture capitalists had experience working in a company at some management level. Now they have great education. I'm not questioning the education, but very few really understand what the company is doing or the problems the company's having. It's a problem, I think.

Hancock: I'd like to look back with you at those early days when you were at Sequoia when you were working with the people like Don and others who really did have technical expertise and operating experience. What was it like working with them and the other partners that you were with in those early days at Sequoia? We started in the middle of that story. How did you decide, when so many people were knocking on your door, how did you decide to start working with Don and with that fund?

Lamond: Well, at first, I knew him. Okay? And then I decided the consulting work was of no interest to me. Because I was advising companies, and they would not always not follow my advice. You know, this company called DEC, okay? So I was advising the Semiconductor Division of DEC. They made a product, a single chip, which was a MicroVAX. You know, they had the VAX family of computers. And at that time there was a company called Sun that was just started making workstations. So I tried to convince the management of DEC, Ken Olsen was the CEO, that they should make a workstation based on the VAX that would be compatible with their larger machines, and they would compete with Apollo, a pioneer in workstations and Sun.

Lamond: It was clear to me that the future was in workstations that were interconnected. I mean, they were on the network.

Hancock: Networked.

Lamond: On networked workstations. I could not convince him, because Ken Olsen said that, "If I do that, it will jeopardize the sale of the VAX machine." And you know, he's well-known for having come up with a IBM-like PC that was not compatible with a PC, because his idea was, "We want to stay proprietary." He was-- it's interesting, because he had a mentality of the 1940s and '50s, if you think about it. You know, we have our own proprietary architecture-- and then it was never successful. And if they had come out with a MicroVAX, it could have changed the destiny of [DEC]. So this is 20/20 hindsight, mind you, but I was not happy being a consultant. I wanted to have more contact with what was going on, more influence as well.

So you're right, it's interesting, but there's still a lot of conversation among venture capitalists. What is the - can you train people? I remember having a younger fellow at Sequoia where I spent a lot of time training associates, like Mike Moritz, Doug Leone, Mark Stevens. They all joined as associates, and I was in charge of training them because Don Valentine was, and is, completely incapable of training anybody. <laughter> No, I'm serious! He doesn't have the patience. If you make an error, you're dead. He doesn't have the patience. Great investor, by the way, don't misunderstand me. Don is a great investor, or was a great investor. So, I spent a lot of time with those associates, and rejected at least half of them, maybe more. But I would spend a lot of time training them and so on and so forth, and you know, it's not easy. You need to have a good nose, yes. But you need to be able to understand the technology if you're going to invest in technology. If you don't invest in technology-- and technology, either software or hardware. And you know, Doug got a degree in Engineering from Cornell, worked at HP in Sales. Mark Stevens got a degree from USC, a master's, worked at Intel. The only exception is Mike Moritz. Don and I interviewed Mike Moritz, because he approached us. And we were very curious, because one of the good qualities of a venture capitalist is to ask good questions. Yeah.

Hancock: Sure.

Lamond: And you know, being-- having been a journalist, Mike was, during his interview, was asking us good questions. So Don and I decided, "We'll take a chance on this guy. He could probably make it, even though he doesn't have a--," I mean, he studied history, if I remember correctly.

Hancock: It was really out of the box thinking, really?

Lamond: Huh?

Hancock: Out of the box thinking, because he didn't fit the profile of other VC partners.

Lamond: Yeah, yeah.

Hancock: So was that a difficult decision for you to make at the time?

Lamond: Well, no, every time we hired an associate, we knew we were going to take a risk. And frankly, Mike Moritz did not start very well. He had some problem starting. But he found out what he was doing wrong, and he did better and started making some investments that made sense. But you know, we were very-- in one way-- and that's the reason, by the way, my view why Sequoia continues to be successful is that first of all, we were not unwilling to get rid of people that we didn't think were going to make it. And some of them found jobs in other firms. But we were trying to get people to think a little bit the same way we were, which was that, "Yes, you need intuition, but the first thing for a venture capitalist is to really evaluate the market potential. Is this a growing market? Is this a new market, but it looks like it could be a big market?" If there are questions about the market, that's a black mark. Then the team. And in general, you'll find that if people choose to go into a product area with a large growing market or a new market, you generally find a pretty good team behind that idea. And then finally, how much money is needed to get to a point where you have something of value. But marketing-- market first, people second. And then you can always find the money, if you have the right product for the right market with the right team.

Hancock: It will follow. So if those were your core questions, and as other young associates or new associates were apprenticing with you, what was the process that you undertook to help them accelerate their learning and be successful?

Lamond: The process was they would attend Board meetings with both Don and I. So, they would see how a Board works. When they presented a company at a partners' meeting, they ought to be prepared. We checked to see how prepared they were. And Don's famous words was, "You can attend Partners meeting, but we don't want to hear you unless we ask you a question." <laughter> It was not--

Hancock: Seen but not heard.

<overlapping conversation>

Lamond: That was his style.

Hancock: Seen but not heard? <laughs>

Lamond: And in some respects, he was right, because you know, the partners were Gordon Russell and I and him, at the beginning. Then we let them contribute a little bit more. The first Board that they would take on then, either Don or I would shadow them. So, for instance, more recently in 2005 when-- well, one company was YouTube. That was Roelof Botha. That was the first company where we let him be the Director, but I would shadow him. And it was important, because when we negotiated the sale of the company to Google, even though Roelof is very, very bright and has a background in finance, he doesn't have a background in negotiations and things of this type. And I helped the company more on the technical side. I mean, there's this thing, if you Google me, you'll see I'm the man that told the founders, "More bandwidth."

Hancock: Well, let's talk about that, because Steve Chen many times has given you credit for asking hard questions, for pressing on technical issues, for talking about growing audiences. So, tell more about that relationship.

Lamond: Well, when we made the investment in YouTube, Roelof Botha introduced me to the company, because they were two guys from PayPal. And I said, "That looks like a long-shot, but let me try to load a video the way that you could-- on the web. If I can do it then more people will do it." <laughter> And I found it was very easy. Then they had this video, if you may remember, but you probably don't, they had a video of a famous Brazilian football player, soccer player, hitting the ball-- have you seen the video?

Hancock: I have. My son is a soccer player.

Lamond: Well, that sold me because I love soccer.

Hancock: My son plays soccer in Sweden now. So we live with soccer.

Lamond: Okay. Well, anyway, so I met the two guys and they looked at me like they were particularly bright. And the one thing I told them was, you know, "When people go on the web and want to watch a

YouTube, it's got to be immediate gratification." That's why I said, "You need more bandwidth!" And this is the reason why I was telling them, it took me 12 seconds! Unacceptable!

Hancock: Yeah, no latency.

Lamond: You see what I mean? And that's why I convinced them that, "Yes--," you know, and I've come to the conclusion in many respects that in venture-- and somebody else said it, I will tell you later who said that-- time is more expensive than money. In other words, if you have the funds, you should focus on the time to market, the development time. Even if you spend more money, because if you're on the market earlier or faster, it will enable-- it's very important for the company to be successful. The person that said that, actually different words is Elon Musk. But I don't particularly admire Elon Musk, but I thought that it was very-- he put in words something I've been thinking about for a long time. That when you reach a certain point, it's worthwhile putting the foot on the accelerator and spend more money to get over the next hurdle, because getting to market earlier is much more important than the rate at which you spend money. And I always had that in the back of my mind, but I never really, you know, I was able to put words around it.

Hancock: So that was a key part of your contribution for YouTube. Were there other companies where you--?

Lamond: Oh, well, other companies, too.

Hancock: Tell me about some of the other companies that--

Lamond: Yeah, a company, Redback Networks. There, it was interesting, because, well, there are two things. First of all, I pressed them very hard to put the product on the market as soon as possible, because I said, you know, "You have Cisco, or you have everybody else looking over our shoulder, we need to get our territory." And they did that. But then the company was ready to go public-- this was 1997, I think, or whatever, '99, just before the big communication bubble, the telecom bubble. And we filed to go public, a \$450M valuation. And there is a public company that made an offer to buy us out. And the CEO said, "I'd like to do that. It's a lot less risky than going public. And I want to sell." So, I said, "No, we're not going to sell." And I had a semi-revolution on my hand from his staff. I had a meeting with all the staff, and I told them, "You're making a mistake. The way the public market is, we should go public. And I'll bet you that the stock will double very quickly." Well, I was wrong. The company went public and within a few months it was worth five-billion dollars. <laughter> So it was-- you remember that time where telecom companies were just--

Hancock: Just sort of irrational.

Lamond: Walking on water.

Hancock: Irrational exuberance of the time.

Lamond: Exactly. So actually I have to say that a number of them, including the CEO, sent me some nice letters thanking me.

Hancock: As they should. <laughs>

Lamond: So you know, there are some things like this in venture that are sort of interesting. But going back to the point you asked me about, "what makes a good investor"? Helping the company select the best people. I get very involved in the early days, and I say "If you want to hire VP Engineering, or VP Sales, I want to interview him or her."

Hancock: So when you're in those interviews, what made your ability-- is it the questions, the vetting? What enabled you to be so helpful in creating those key positions?

Lamond: Well, first of all, I think I'm a pretty good judge of people. So I love to-- when I interview somebody, I ask very few questions. I want people to talk to me. I find I learn a lot more than by asking questions. But in certain cases, I have very specific questions. If you're an engineer, "I want you to tell me about the last project you worked on and what problems you hit. And how did you solve the problem?" If you are a young PhD, I say, "Please tell me what was your thesis and explain it to me. Assume I know nothing." So I've heard things about quantum computing, or X-band amplifiers, or stuff like that, that I understand better than quantum computing.

I'll always try to get the interviewee to-- if it's a sales person, I ask two questions. One is, "How did sales in your area increase in the last three years? By how much? And how do you explain why they increased?" Another important question to ask from a salesman is, "What was your W-2?" <laughter> "Yes, how much of it was fixed and how much of it was bonus?" You want a salesman that's very hungry. That he makes \$150K base, but \$500K total. You know, this type of thing. There's no magic, you know? Interviewing people, there's no magic. You got to find a way to know the person. I don't ask questions like, you know, personal questions. I'm very curious, and I often -- especially among young engineers, "What is your education and how did you do in college? What sort of grades did you get?" Turns out that people who have good grades do better, in general. Not always. Not always, but in general. So it's not that difficult.

But helping the CEO recruit a first-class team, I think it's part of my job as a member of the Board. Now, I'm looking to interview, you know, young engineers. Like yesterday, I'm on the Board of a company

called Cerebras. and I interviewed a very, very good guy who is at Google right now -- PhD in artificial intelligence and stuff like that. And you know, he's going to be a senior engineer. We need top talent and so I spent an hour with him, partially interviewing him, but partially selling him. So that's the job of a venture capitalist. It's not just to be a purveyor of money. Because you know companies aren't just successful because of money, they're successful because of people.

Lamond: If you have the best people, generally, you're successful. So I found that Sequoia was a really great experience for me. Then I was ready to resign, actually resign, because I was going to retire. And Vinod Khosla contacted me. I had known Vinod for 20 years or so. And I was interested, because he was going to invest in clean tech. And I wasn't getting much support from people in Sequoia about clean tech. It turns out they were right, by the way, because clean tech is not a good place to invest. It's actually a terrible place to invest.

Hancock: At the time it was hard to know that.

Lamond: Well--

Hancock: You think? Or do you think that it was-- is it just the benefit of hindsight?

Lamond: Well, I should have read the tea leaves.

Hancock: You should have?

Lamond: Yeah.

Hancock: You would have read them differently?

Lamond: In retrospect, you know, it's 20/20 hindsight. But I went to Khosla Ventures, and I didn't enjoy my time there.

Hancock: It was what, 2009?

Lamond: Because his-- that was 2009 to 2013. Vinod is very, very smart, but he has a very, very tough time in working as part of a team. He wants to make all the decisions. So after two years, I decided I wanted to leave, but I couldn't leave, because if I had left, it would have really hurt him trying to raise his next fund. And I felt, you know, I made a wrong decision, but you can't, you know, I have an obligation

not to torpedo him. So I stayed until he raised his next fund then I left. And I started making-- by the way, I made one-- interesting investment at Khosla, which is Skybox. Have you heard of Skybox?

Hancock: Yep. Do you know Ching-Yu?

Lamond: Huh?

Hancock: Ching-Yu Hu, one of the cofounders--

Lamond: Oh, yeah!

Hancock: She is actually on the NextGen Board here at the museum, which reports up to me here. So yes, I know about Skybox, to Google, to Tera Bella. Yes, I do know.

Lamond: But you know, investing in a satellite at that time, they all thought I was crazy.

Hancock: How did you make that decision? Because that was unusual--their concept, their business model.

Lamond: When I met the team, I was pretty impressed with them. They seemed to know what they were going to get into. It turns out that they didn't know as much as I thought they did. But I could see there was a great opening for a company bringing, if you don't mind me saying so, the satellite industry back up to present-day technology. I don't know if you know it, but NASA uses technology that's, on average, 15-years-old. Just like the armed forces, because they want to make so sure that everything is solid. It takes years and years of testing. And it moves very slowly. The big companies that put these big satellites in orbit, decided that'd cost \$500M or something. They last a long time. But they don't have the capabilities that Skybox promised, which will have a flotilla of satellites so that you can get a picture of any place in the Earth within an hour, instead of days or weeks. I felt that was pretty interesting. And I did some work on the market and found out that, yes, there was a need for more up to the time pictures. And they convinced me they could make a satellite for \$3M, and launch it for another \$3M. They were wrong on both counts.

Hancock: Mm hm. <laughter>

Lamond: First of all, it turned out that we could not find a telescope that would enable us to take pictures, we could not find a commercial one. They thought we could. So we had to have one designed. It cost a lot more money that we expected. The satellite grew in size from 70 kg, to close to a 100. And it

cost a lot more than we expected. And the launching, we found out, was costing a lot more than expected. But you know, even though we were delayed by the Russian launch timing, we eventually put a satellite in orbit that works to this day even though at first we thought it would last only two years. And overall, they did a pretty darn good job. And the big difference is that we used commercially available components. So the cost of the satellite was a lot less than NASA. NASA doesn't know that there's a thing called redundancy.

<group laughter>

Lamond: And software is so good these days that you can do corrections even if you have a problem. So you know the company from a commercial point of view - I don't think the company is successful even to this day. It could have been successful, I think, even if Google had not acquired us. But when Google acquired us, made an offer to acquire us, I have one rule which is that if the management wants to sell, then sell, because what am I going to do, replace the management? Do it myself? That's not going to happen. So we sold. From an investment point of view, it was a good investment.

Hancock: Was it \$400M? Do you remember the purchase price?

Lamond: \$550M.

Hancock: Five fifty.

Lamond: Yeah. It was a big win for Khosla Ventures. The other win I had was a company called SeaMicro. I mean the funny thing is that the only two companies in which I really made money or the fund made money were not clean tech companies. SeaMicro was a low power server. The founder of which, by the way, is now the CEO of Cerebras, a company I also invested in. And then the next investment that I made that's successful is Square, the payment system. And there I got involved in a company, I met with the CEO at Greens, a restaurant in San Francisco, with Gideon Yu.

Lamond: Yes. Gideon Yu introduced me and we went to meet Khosla, and we made the investment. And it's turning out to be the savior of the fund. But no, Khosla was not a good experience for me. So I left. I started making investments on my own as an angel. I did maybe 20 investments, mostly in hardware, because I decided that I can't compete with people that are investors in software. They're all looking for the next Facebook. And I don't like that. I don't understand it. And so, I focused on hardware. And I made a few investments, some of which look like they're very successful. You know a company called Leia?

Hancock: I don't.

Lamond: L-E-I-A like Leia from the movie. They have developed a 3D display that doesn't require lasers. It's a true 3D like you see a holographic display but using-- actually I should introduce you to them, because I think you should have one of their products in this museum. It's absolutely amazing. It's absolutely amazing.

Hancock: Please do. We should learn about them.

Lamond: It's 3D. On a cellphone you can look from the side and you see it in 3 D-- and they are successful. I mean they're going to be in cellphones this year for sale in 2018. I invested in Eargo, CNEX and others. And then I met this guy Lior Susan...

Hancock: Before you jump ahead to that, I want to ask a little bit, you talked about the focus on hardware. Was there any geographic focus? Or was it all close by?

Lamond: Here. Yeah, here. I don't like to travel for business. No, here. I made investments-- I was looking for companies that had a hardware and software. I mean there's no such thing-- my view- as pure hardware designs. So you're not looking for somebody that's making a simple box. You want an intelligent box. You see what I mean. So they were either in electronics - no consumer to speak of. None. I invested in a company in 3D printing, metal printing. I sold my investment in that. These type of things. I invested in a company (Eargo) making a very, very small hearing aid that you can insert in the ear and nobody sees. It's really nanotechnology. You want to see it?

Hancock: I do.

Lamond: And it's rechargeable. Pretty interesting.

Hancock: Yes. That's a big market.

Lamond: It's a big market. Yeah.

Hancock: An interesting application area.

Lamond: I'm marginally deaf. I've lost 20 percent here and 24 percent here. I just feel more comfortable wearing them because like this I can't hear without having to focus.

Hancock: Fantastic.

Lamond: Yeah. And then I invested in a few companies in systems, memory systems and things of this type. Areas that I know, you know, that I think I can help the company in one way or another. So, I'm happy with my investments. I made one biotech investment, believe it or not.

Hancock: So that's out of the pattern.

Lamond: Completely out of the pattern.

Hancock: What prompted that?

Lamond: It's a complete gamble, I have to admit. It's something to do with Alzheimer's. Because if you ask me, you don't, but I will give you the answer anyway. If you ask me, I know I'm 86 years old.

Hancock: It's amazing. I'm amazed. I could do the math but I'm amazed that you're 86.

Lamond: Yeah, I'm going to be 87 in four short...

Hancock: Fourth of July, did you say?

Lamond: No, in September 12.

Hancock: Oh in September.

Lamond: Yeah. I don't think about my age, to tell you the truth. I mean I don't get up in the morning and say, oh my God, I'm 86. No. I find that there are some things that I can't do the way I used to. For example, I can't play tennis anymore but other than that-- so anyway. I forgot the train of my thought, but...

Hancock: Your Alzheimer's that's out of the box, your biotech investment.

Lamond: Alzheimer is the only thing I'm afraid of. Somebody came to me with an idea that I thought from my limited knowledge scientifically correct. I had one of my friends at UCSF, we're fairly close to UCSF. I asked them what they thought of the idea. So, I invested in a company. The idea of the company is that Alzheimer's is caused by a microbial infection of the brain.

Hancock: Really? Interesting.

Lamond: We'll see. We have proof in dogs but that's not enough. I'll let you know more a year from now.

Hancock: I'll be vitally interested. Before we move into your Formation 8 time, over the stories that you've been talking about with Sequoia and Khosla Ventures. you've talked about people - entrepreneurs that you worked with, and then subsequently worked with them in another project. Gideon Yu is a good example. Can you say a little bit more about the people that, as you say, it's all about the people. And these relationships of a few people that you found to be trusted partners or collaborators. Can you say a little bit more about that? Or repeat investors.

Lamond: Well, unfortunately, people are in your life for a while and then they disappear. I mean they are going in their own direction. So there are a lot of people that-- I mean I still have contacts occasionally with T.J. Rodgers. We still have dinner occasionally. But in this business, you'll find that people eventually move around, go into a completely different direction. I still am very close to a couple of guys that I mentored when I was at Khosla Ventures. One is named Ilya Fushman. He's now with Index Ventures. Another one is Rami Adeeb, and he going to start his own fund. So they keep track of me because they are now in the venture capital business as well. But you lose track of people very quickly. Very quickly. Occasionally I hear back from somebody from way back when that says, "Oh, I saw your name. I need help on this. Or how are you?", these types of things. But it happens very rarely actually, if I think back, Andrew Feldman a founder and CEO of Cerebras is probably one of the few that I invested in the second company that he started. I can't think of others. But when I was Khosla I invested also in a company called Seeo, S-E-E-O, that's a battery company.

Hancock: Battery company, right.

Lamond: And I was very friendly with the CEO, but he's now gone into a different company so we keep in touch occasionally. Seeo is a company that got sold to Bosch. Actually, it's going to be successful. It's going to one of the few battery companies that's successful. But battery is a tough business.

Hancock: Very tough.

Lamond: No, I don't have a network of people that I can still stay in touch with. There's a lot of movement. It's like the tide coming in and getting out. I don't have many relationships with people, for instance, that I invested in at Sequoia. I occasionally see some of them. It's mostly in a social occasion. Steve Chen - I saw him at the Asian Museum. People like that I don't-- and I try to be very friendly to the CEOs but I don't want to be very social with them. I would invite them occasionally with their wife to have dinner with my wife. But I don't want to be too much of a friend because you don't know what-- I mean

what the relationship is going to be. Are they going to be successful? Are they going to be very happy that I'm a friend of theirs? Or am I going to be in the position to tell them you're not doing the job.

Hancock: Yes, those difficult conversations.

Lamond: It's a difficult conversation if you become too friendly. So that's the reason. And I'm not that friendly with many venture capitalists because I find them boring, most of them.

<group laughter>

Lamond: I'm a snob, I have to admit. But I have interests-- if you ask what my life is beyond business, I have a family.

Hancock: Yes.

Lamond: Six grandchildren. One of them is married. Trying to make a child as they say these days.

<group laughter>

Lamond: Another one is going to get married next year. I have two smaller ones that are three and five from our son. He started later. So that's occupying me. Christine and I love to collect art. And we have an art collection but we keep it very private. The type of art we like is not necessarily liked by everybody.

Lamond: Very tough art. It hits you in the stomach, when you see it the first time. Anyway, that will give you a short... You should censor this part of the-- people don't have to know much about me. I like to be more anonymous--as anonymous as possible. I don't like the limelight. There are too many venture capitalists these days that promote themselves a little bit too much. So I am now-- I met Lior Susan and he was-- he had just left Flextronics and he started a fund focused on hardware. And I thought this is a guy that thinks like I do. I got to know him better. And we decided to start a fund. Actually, he did all, I should say, of the fundraising. And we have a fund, the first one is already fully invested, \$125 million focusing on very early stage hardware companies. And we are really keeping the focus. We are not doing software. We're not doing anything out of there. And we raised another fund \$175 million, early stage, \$125 million follow up and we are investing.

And I have a few investments I'll tell you about them. Mostly a company in robotics and artificial intelligence called Kindred located in San Francisco with an A.I. lab, artificial intelligence lab in Toronto. Unbeknownst to me, Canada is the world capital of artificial intelligence. We have fourteen people in A.I.

in Toronto--very, very capable guys. We're developing robots that have some level of intelligence. You know, they can learn on the job to do different things. The first application we're going after is for fulfillment centers to pick up things and put them in a box to be shipped. Right now, people have to do that. It's a completely boring job. You take something. You put it in front of a scanner. You put it in the box. You'd be surprised. There are 40,000 people in this country doing that. There are 400,000 people working in fulfillment centers. So we are testing this. And we have a very strong artificial intelligence group. And the idea is that at first we have the robot is totally operated by a human being. And less and less as it goes. So at the beginning it's 80 percent and at the end it's 1 percent.

Hancock: Sure, it has the learning.

Lamond: And then I have an investment in Cerebras. They are the company that is in stealth mode. I'll just tell you it's artificial intelligence. Then I have an investment in a company called Diassess. When I say I have investments, these are investment that I am responsible. Diassess is developing some hardware and software in biotechnology to basically do a very quick test of things like the flu. Do you have the flu or do you have a cold? If you have the flu you can cure it. And they also have an application that's going to take to-- they are very close to market for STDs, you know. There's an awful lot of STD -- that are silent for women. And eventually the idea is that there'll be a test you can do at home and you can find out if there is a problem or not. So, it's better for people, instead of having to go to a clinic. This is a company out of Berkeley. I'm investor in a company called Flex Logix. Actually, it's in the semiconductor field developing IP (Intellectual Property) run by a fellow named Geoff Tate. He was the founder of Rambus. And the idea is to develop IP to have FPGAs incorporated in other chips. The company has started doing pretty well. I'm involved in an ag tech company developing technology for precision agriculture.

Hancock: So all together, what's your current portfolio of companies that you're actively invested in, maybe sitting on boards currently?

Lamond: I am involved directly and completely in six companies. Totally, we have 40 companies in the portfolio by now. We have four partners one of which is Lior. The other one is a fellow named Greg Reichow. He used to be the COO of Tesla. He has an interesting background because he started at Cypress. And then was at SunPower. And then he was hired by Elon Musk to run the manufacturing at Tesla.

Hancock: Interesting.

Lamond: So that's it. And here I am now.

Hancock: So I'd love to take a step back. You're still very actively investing. But I'd like to hear you've also been a leader on the industry level. You were president of the Western Venture Capital Association.

Lamond: This is a long, long time ago.

Hancock: Long time ago. But with that perspective of now venture investing since the eighties, how would you characterize the evolution of venture capital as an industry. And sort of risks and opportunities of the industry as a whole now. Do you have comments on that?

Lamond: You probably know the statistics better than I do. But I find it interesting that out of the, I don't know how many venture firms there are now somewhere around 1000, how few are really successful. It's interesting. It's interesting that there are so many venture firms that survive, even though I would not put my money there. And this has been going on for years. It used to be there were 30, 40 firms that were giving reasonable returns. Now, ten? You should not invest in venture capital because very few firms are making money-- are making real money. And if you think about the fact that it's completely illiquid. It doesn't make sense doing it. I remember having a dinner with Tom Perkins of Kleiner Perkins--it was a social dinner. A lady sitting next to him said, "Tom, I want to invest in venture capital." And she's a widow. She's fairly wealthy. And this is quite a years ago, and Tom said, "Don't."

Hancock: Don't do it.

Lamond: Don't invest in venture unless you can invest with one of the few firms which really gives returns. And that's strange. You know, you would think that investors-- that limited partners would realize that unless you can invest in the likes of Sequoia and a couple of others, you should not invest. You should not invest. And so, what I'm telling my partners, because they've never been in venture, I said, there's only one thing that counts in venture, cash on cash. Because I can easily show you great IRR because I can sell a company in one year and show tremendous IRR. But what people want is they want to put a dollar in and get four, five or more dollars out. And I'm amazed at what's going on in venture capital. I really am amazed. In any other industry, all of these things would not be able to re-up.

Then the other thing that's happening is the incredible numbers of really small funds. I'm not talking about \$100M. But there are people that raise \$50M or something. And then they make small investments. And the CEOs do not understand that it's important to invest in firms that will be able to do at least one follow up round. And that's the reason by the way we decided at Eclipse to have a larger fund, so we can put \$4 million in the first round and then \$10 million in the next round. We don't have to invest forever. But at least show significant support for the company in the next rounds. And so these micro funds have created a lot of noise on the signal because they tend to invest in all sorts of things that should not be invested in. Not every idea deserves money. You're going to find that I'm tough. I'm fair, though.

<group laughter>

Hancock: That's the best kind of tough. Right?

Lamond: No, but there's too much of that going on right now.

Hancock: What are your thoughts about the Valley? You've been here helping drive and grow the Valley over now successive generations, where it's been able to create and recreate its leading edge. What's your assessment of the Valley now and looking ahead?

Lamond: Well, you know, the reason the Valley has been successful so long is just the networking effect. I mean it's not anything else. I mean if you get a degree at MIT and you look what's available around MIT in terms of investments, or capable investors, I should say you come to the Bay Area. You come to Silicon Valley. I see one major [challenge]-- it's not shown up completely yet, but it's going to show up. It's impossible to live here, cost of living. When I explain to people that in the sixties and seventies and even early eighties it was fairly easy to move people here. At one time, I remember, hiring people on the east coast because it was cheaper to live in California than to live in Boston.

Hancock: That's a distant memory for housing.

Lamond: But it shows you how old I am. But it's very interesting that what's happening is that it's not the cost of living, per se. It's the real estate. So if you're single and you live with a buddy somewhere in an apartment in San Francisco you can afford it because it's going to cost you \$1500 a month and \$3000 between the two of you. But if you're married and you want to have a family, which occasionally people want to do that, you can't do that here. I mean it's becoming nearly impossible. I mean even if you make \$500,000 a year it's difficult to buy a house. \$500K after tax, it's less than that. And so I think this is going to force the slowing of Silicon Valley. And I'm not saying that it's going to emigrate in Phoenix or in Austin, or not to Boston, because Boston is getting close to here in terms of cost of living. But it's going to disperse because people can't afford to move here. I mean we have a constant problem hiring somebody from outside the area and moving him or her here. It's not possible. So if you hire a VP sales it's okay if he resides in Colorado or some place. But if you want to hire a VP engineering he has to move here. And you can't do it. I mean I know of a case of somebody that was in the Chicago area, was at Illinois Urbana with a Ph.D. and he said, "You know, I get a job in Minneapolis and I can buy a house very quickly. If I come here what am I going to do?" And so I think that's going to hurt Silicon Valley in the long run. I don't know. Unless we build a lot more reasonably priced apartments.

Hancock: Yeah, the push for high density housing. So that's a major concern. As you look at-- are there any upsides? Why do people continue to gravitate here? Why do you continue to focus on the pipeline here? Are there sort of strengths that you see as sustaining strengths for the valley?

Lamond: Well, I don't think it's going to collapse. Things don't collapse. You know that. I think that slowly but surely they'll be more startups in Washington, not Washington D.C., Washington state.

Hancock: Seattle, around Seattle.

Lamond: And we see some of them out of Microsoft and so on and so forth. I think that you'll see more and more companies started. You know, we've made now three investments in the Boston area, although I don't like it, but this is where the companies are and they can't move here. These are all startups. They can't move here. They would have loved to move here, but they can't afford to. They are already based in Boston. Boston is not that cheap. But if you don't live in a certain area, there's a lot of rooms around-- a lot of room around Boston so you can live in one of the suburbs. And the costs have really stayed down. I don't know. Forty percent less than here. It's not that cheap. But 40 percent makes a difference. So we have three companies. We're invested in a 3D printing company, a very interesting one. A robotics company, and in another industrial control company. We have one company in Toronto. We're looking at one company in L.A., because L.A. is cheaper than here. And we don't want them to move. They are out of Caltech. They might as well stay there. So I don't know how long it will take. I will not predict. But I would say that you'll see a slow erosion.

Hancock: Interesting.

Lamond: You don't think so?

Hancock: I'm an optimist. But for long term reasons about why the valley isn't able to reinvent itself.

Lamond: See, I'm an optimist about the number of startups. I think of the number of startups, and I'm talking about quality startups is not going to decrease. It's not going to decrease. I think it's going to go on increasing. I think that's one great advantage of this country over many other countries-- entrepreneurship--the ease of starting a company, the ease of getting capital, the infrastructure in terms of legal and so on and so forth. I think we continue to have an advantage that's measurable over other countries, maybe except the U.K. Maybe except the U.K. But there's a mentality here that doesn't exist in continental Europe even though there are startups in France. It doesn't compare to here. One of the major problems of France is that a lot of the brains are getting out.

Hancock: <laughs>

Lamond: I'm serious. I'm very serious. It's a brain drain in France.

Hancock: Yeah, the flow of people moving away, the talent.

Lamond: Yeah, there a lot of French people around here. But the United States, I'm not worried about the startups. But I'm telling you there will be more startups in places where there are great universities like Texas, the University of Texas or around Boston, not necessarily New York. We have one investment out of Northwestern in Chicago. A great company, a great idea, both hardware and software. Great idea.

Hancock: Well, you've been so generous...

Lamond: I'm optimistic from that point of view.

Hancock: And thank you because I was going to ask you about how you look at what's happening and other clusters. You answered that question. You anticipated my question. I'd like to close my part of this conversation by asking another question since the museum is known to preserve the legacy of history but also to inform and inspire the next generation. So, as you think about your tremendous experience and insight, what words of advice, or lessons learned, could you share for the next generation young entrepreneur, or venture capitalist, who is looking to you for some advice?

Lamond: My advice to the entrepreneur is that entrepreneurship requires a special gene. You can't force yourself to be an entrepreneur. Either you want to be an entrepreneur, and you understand you're taking a lot of risk in being an entrepreneur. But when I see universities teaching entrepreneurship, I laugh! Because either you want to start something or you don't. I think it's important, though, for people to continue to look at risk/reward. I mean by being an entrepreneur, you take a lot of risk. So, take it at the right time. Don't wait until you're married and you have two children to take too much risk. Do it at a time where if it doesn't work you're the only one that suffers.

But there's nothing more exciting than to start your own company. You can look back and say it's like having a child in some respects. It has the same problems right away because having a child is sometimes, you know, they don't all turn out well. I've been lucky. But I mean having built something, being able to look back and say I did that, is quite satisfying. It's more than just the money, by the way, because if the only motivation you have is money go to Wall Street. Motivation is you want to build something. You want to contribute something to society. You may disagree with what Facebook is contributing to society. I won't argue that point. But he did contribute something. I think that when you start a company the big thing is to feel that you have achieved something in your life.

Hancock: Well, we here are very focused on the impact through technology innovation, economic value creation, social impact. When you think about your legacy, I know you're a very modest person. But what are the things that you would like to be remembered for, for the impact that you've had in these areas or others?

Lamond: It's a tough question. I don't know what I want to be remembered for. I get people sending me emails saying, "I remember how tough were you and thank you."

<group laughter>

Lamond: I continue to be pretty tough. No. I think that I don't know that I have a legacy necessarily. I did what I thought I should do. That's it.

Hancock: Okay.

Lamond: And I don't plan on retiring right now.

Hancock: Clearly, since you have six investments now and more to come. It sounds like you're...

Lamond: Yeah. You know, as long as I enjoy what I'm doing, and as long as I feel I'm contributing something - like when I leave here, I have a meeting at Cerebras, because I'm helping them on some technical matters right now. Oh, I should say I am giving them advice. They don't need any help. But I think that I've been very lucky, you know. Very lucky.

Hancock: Well, that's a wonderful way to end. Pierre, thank you so much. It's been a really an honor to have you here at the museum. Thank you.

Lamond: Please. No, if I had to give advice to young people right now and I'm happy you didn't ask me that question because a lot of people have asked me that question is what's going to happen with all of these robots?

Hancock: Concerned about...

Lamond: It's going to have a major impact on employment. Major.

Hancock: Robots. So your biggest concern is on job displacement.

Lamond: It's a very tough question because we have investments in six robotic companies. Four of them are doing very well. You know what that means? This company, Kindred, at one of our potential customers, is going to replace 30 jobs out of 40. And it's going to be the case in many other places. So, if we had 100 percent of the market, we would eliminate 30,000 jobs.

END OF THE INTERVIEW