Stan Fleming

Interview conducted by

David Caruso, PhD

March 28, 2014

San Diego Technology Archive

The Library
UC San Diego

Standish Fleming

A 27-year veteran of venture capital investing, Mr. Fleming has helped raise and manage six venture funds totaling more than $500 million and has served on the boards of 19 venture-backed companies. He has extensive experience in all aspects of venture management and finance, including fund-raising, investor relations, operations and portfolio development. He has made investments, managed portfolio companies, raised funds, pursued business development, taken companies public and successfully exited investments through public-market sales and buyouts.

In 1993, Mr. Fleming co-founded Forward Ventures. In his capacity as a founding managing member he served as the initial president and CEO of Triangle Pharmaceuticals (acquired by Gilead Sciences, Inc. [NASDAQ:GILD]), Actigen (now part of Corixa/GlaxoSmithKline [NYSE:GSK]), GenQuest Corixa/GlaxoSmithKline [NYSE:GSK]), and CombiChem (acquired by DuPont [NYSE:DD]), and now part of Deltagen [Pink Sheets: DGEN]. Mr. Fleming was a founding board member of Arizeke Pharmaceuticals, Ciphergen Biosystems (now Vermillion, Inc. [NASDAQ:VRML]) and Gryphon Therapeutics, and formerly served on the boards of Acorda Therapeutics [NASDAQ: ACOR], Converge Medical, Doctors on Line, EndiCOR, First Dental Health, IntensiCare, Kemia, Inc., MitoKor, and Tandem Medical. He currently serves as a director of Ambit Biosciences [NASDAQ: AMBI], and was a founding director of Nereus Pharmaceuticals. Mr. Fleming serves as a director of CONNECT, San Diego's support organization for the academic-to-early-stage community, and is a past president of the Biotechnology Venture Investors Group.

Mr. Fleming enjoys extensive networks throughout the venture, entrepreneurial, scientific, medical and pharmaceutical communities. Venture funds he has managed have made investments in more than 70 private and public companies, a number of which have gone public and/or been acquired by pharmaceutical companies. He has helped start more than 15 companies and served at founding CEO of eight.

At Forward, Mr. Fleming has made investments in almost every segment of the health-care industry, including pharmaceuticals, biologics, diagnostics, devices, services and software. He has managed both platform and product companies/investments in the portfolio and led or participated in financings at all levels from pre-start-up to PIPES in public companies, in both debt and equity.

Before establishing Forward Ventures, Mr. Fleming served as the chairman, president and CEO of GeneSys Therapeutics (merged with Somatix and acquired by Cell GeneSys [NASDAQ:CEGE]). He began his venture career with Ventana Growth Funds in San Diego in 1986. Virtually all the major investors in the Ventana funds were overseas corporations in the Nordic countries, Europe and Japan. While at Ventana, Mr. Fleming gained extensive experience helping limited partners realize their strategic as well as financial goals through the venture program. He earned his B.A. from Amherst College and his M.B.A. from the UCLA Graduate School of Management.

Source: Forward Ventures Website

The Library
UC SAN DIEGO

THE SAN DIEGO TECHNOLOGY ARCHIVE

INTERVIEWEE: **Stan Fleming**

INTERVIEWER: **David Caruso**

DATE: **March 28, 2014**

LOCATION: **La Jolla, California**

Caruso: Today is the 28th of March, 2014. I'm David Caruso. I'm here with Stan Fleming in San Diego, California. This is an interview as part of the San Diego Technology Archives Oral History Project. Thank you again for taking the time to meet with me today. I want to start off with just getting a little bit about your background to hear where you were born, where you grew up, education, how you came to the San Diego area or why you stayed in the San Diego area if you're not from here.

Fleming: I was born in Pasadena California at the Huntington Hospital on April 15, 1947. I grew up in Pasadena, Flint Ridge. The house was up in Flint Ridge. I went to school in Pasadena, a school called Polytechnic School, a private school right across the street from Cal Tech. I went there from kindergarten through high school. From Poly, I went to Amherst College in Amherst Mass. I was an English major there and graduated in 1969. Following graduation, I spent some time in Berkeley, and decided that was not for me. I worked as a deck hand for a while on a yacht, which I had been doing during my summer vacations in college and high school.

I taught school for a while at the Dunn School and then at the Harbor Day School in Corona Del Mar. I worked as a freelance writer. I worked for my father in his lumberyard, Fleming Lumber in Los Angeles and then left him and went back to freelance writing, which I did for a while. After my mother died, I had a small inheritance. I took that money and went back to business school, the Anderson—well, it was the Graduate School of Management at UCLA at the time.

Caruso: What year was this around?

Fleming: I graduated in 1986 with a focus in finance and entrepreneurial studies.

Caruso: Why did you want a business degree?

Fleming: I just wanted to go in a different direction. Actually one of my freelance jobs was as the business editor for *Air-Cal Magazine*. At that time there was an airline—I think it may have ended up as part of PSA. The airline was Air California. They had a magazine that they put in the seat backs like most airlines do and I was the business editor for them. So I went around and interviewed the business guys, primarily the large advertisers. I got intrigued by business in that process and so rather than sit on the sidelines and observe as a journalist I thought it would be interesting to get involved and I went back to business school.

Caruso: What is it that intrigued you about it?

Fleming: There was a sense of exploration. It was a new direction. It was new material. It was academically challenging. I did go back and take the calculus, economics, accounting, statistics, that kind of stuff. I was ready to get back into an academic mode. I enjoyed that, but the further I got into it and more involved in it, the more I began to see the creative side of business. I am a child of the '60s and the establishment was not our friend. They wanted to send you to Vietnam. That was not my idea of where I wanted to go and what I wanted to do with my life.

I had started with an adversarial view of the establishment. With the writing, then the prerequisites, and ultimately the experience at UCLA, one of the things that really came through to me was the potential for business as a creative outlet. The ability to be creative within the business framework was really intriguing to me. The further I got into it, the more interesting. I like the academic discipline of business school. The logic and the theory were interesting.

Caruso: Going into the school did you have an idea of what you wanted to do after school completed?

Fleming: I wanted to get engaged in the business world in some way. I was profoundly unsatisfied with the feedback that I was getting or the sense of fulfillment that I was getting as a freelance writer. The motivation was more contextual. The intellectual discussion, a new landscape, a new world to explore was really why I went back. For instance when I went into UCLA I had never heard the term venture capital. Of course that was in 1984 probably not a lot of other people had either. So I did not go with that in mind.

I've always thought of myself as rather entrepreneurial, as a freelance writer and all the rest. I think that was at the back of my mind. I was really following instincts, feelings, interests rather than a disciplined plan.

Caruso: Did something change for you while you were in the management school?

Fleming: The main thing was that my attitude toward business changed. I really enjoyed it. I really enjoyed the theory of it, the process of business, and I found UCLA to be a very exciting place. It was at that time some of the professors used to talk about two levels. They had the ordinary paying students who showed up, and then you had the really competitive top-level grad students who were trying to get jobs in the investment banking world, in Goldman Sachs, and places like that. I really found the competitive top level. The other element at UCLA was they had a heavy emphasis on finance.

Now I never thought of myself as particularly quantitative person – and I still don't for that matter, but the finance as the lingua franca of business is the one perspective that cuts across the entire business space from marketing to human resources to M&A to international. They all can be evaluated, can be tied together through finance as a theoretical framework and structure. I found that fascinating. I really became intrigued with finance, which was a surprise to me because I started off as an English major. I'm not a particularly quantitative person anyway. The elegance of the theories were quite intriguing.

Caruso: The professors at the school, were they tried and true academics? Were they people who had spent some time in business and were doing academics as well?

Fleming: Some of both. Frankly, I enjoy the variety. I enjoy working with them. They had some very high-level finance professors. Their finance department was top of the top. While I was there, there was a guy name Dick Rolls who spent a year on sabbatical with Goldman Sachs designing mortgage backed security instruments. This was long before any bubbles popped, but [he was] trying to cope with some of the basic underlying quantitative nature of these things and developing new theories. These guys were really top drawer. I enjoyed that. They had some retired guys as well. There was a guy named Professor Cochran who is still there. He was a former investment banker. It was a great mix. It really couldn't have been better for me.

Caruso: Was this a purely classroom-style type of degree or were there components where you were out in the real world interning?

Fleming: This was a full-time MBA student [program]. We worked on a senior thesis that was quite interesting. One of the students was Saudi and I think his father was in the foreign office. They were an important customer for large

engineering companies like Floor and Bechtel. We put a team together to do a study for Bechtel and that was a lot of fun and quite interesting. It was quite a heterogeneous team because we had the Saudi on it. We had a guy from Tunisia and two or three other people. We looked at the financial risk assessment or modeling for cogeneration projects.

Again, it was an interesting sort of semi-real world. We were more real world than Bechtel was. Bechtel thought they were going to give us a lesson in finance and what we did is show them totally new ways of approaching it, like using option theory. There was a professor at UCLA, don't know if he is still there—Geske—who was one of the top theorists in option theory. We had some very elaborate modeling with Monte Carlo simulations that periodically blew up the computers in those days. We were a couple generations ahead of where the technology really was. The guys at Bechtel didn't really know what to make of it. They thought we were going to present a project to them and they were going to give us a grade like one of their guys had done. We showed them stuff that they weren't even aware of, that was the next 10 or 20 years down the road. But that was a lot of fun. So again, that theory meets practice was an outstanding opportunity for me.

Caruso: Obviously the '80s are an interesting time period given some of the transformations that wound up going on, in terms of the investments, in technology and the more drastic rise in biotechs, but also a period of time nearing the end of the cold war, where funding is starting to change. You were coming out in that period where these changes were going to be happening to a certain degree. I'm wondering what is it that you decided to do with your degree now that you had finished up. What was your plan going forward?

Fleming: So I was interested in finance. I was also the oldest full-time student at UCLA at the time. In fact, they put my picture in the brochure saying old people could get a full-time MBA. I think I was 38 or 39 when I graduated. Well, in '86 I would have been 39. So I was interested in finance. I interviewed a member at Tandem Computers in Palo Alto. That was very classic Silicon Valley at the time in the finance department there. It was the large computing firms or computer firms and software firms that were oriented towards the engineers. This sounds a little pompous, but they call it *in loco parentis,* which is the way the college used to talk about taking responsibility for students. They were the local parents for these students. Well, the Tandem computers served that function for their engineers. I found that a little oppressive frankly for somebody at my age. I was interested in venture. Once I got there, I found what venture was and discovered the venture club. It was quite intriguing to me because it was a combination of the things I was

really interested in. It was entrepreneurial and it was finance. It was sexy because it was quite a prestigious area to work in at UCLA.

Now I was at a severe disadvantage as an English major because most of the venture either was IT, high tech, biotech or required some kind of a technical background. So I applied and I did get invited to talk with a group that had offices in Irvine and San Diego called Ventana. Tom Gephart ran the Irvine office, Duane Townsend ran the San Diego office. I spoke with Tom. Their interest in me was my background as a freelance writer. My interest in them was as a venture fund.

They were—as probably most venture funds are—somewhat idiosyncratic. They were very much a reflection of the personalities of the guys that were there. Tom was a fundraiser and that is essentially all he did. I don't think I saw him make an investment in the entire six years I was there. One of the reasons that he hired me was he wanted me to write marketing material for them, but also prospectuses, memorandum, and that kind of stuff. I rather enjoyed and I could do.

I went there in June of '86 and up until about 1990 that is essentially what I did, support the marketing arm. Tom was just in a constant fundraising mode. The first Kleiner Perkins fund in the late 1970's was a $3 million fund. So at this point $50 million was a big fund. Tom and these guys were raising funds in the 10 to 15, maybe $20 million range. I helped them raise funds. They were on their second fund at that point and then I think we raised $14.5 million. We went on to raise a third fund, Ventana 3, which was primarily raised out of Japan. I essentially did all the organization, all the structuring on that and then went along on the fundraising. I made some trips to Japan in the late '80s, which was an interesting place at that time. It was the absolute peak. We had a first close on that fund in December of 1989, I believe. I think the Japanese stock market peaked in January of 1990. We finally closed it in June and I think we ended up with maybe 18 or $19 million in the fund. Having raised the fund, I said, "Listen, I want to be more involved on the investment side."

At that point I shifted my focus down to San Diego. I would commute back and forth from Laguna Nigel, where I lived at the time. I wanted to be a venture capitalist and real venture capitalists invest money. That's what my colleagues from UCLA who had jobs in the industry were doing and that's what I wanted to do. I started working with Duane down here. Duane's real interest was small device companies, small medical device companies. He had been an accountant at Ernst and Young I believe. Then I think he was the CFO or even the CEO of a company that made heating and cooling pads for shipping biologically sensitive materials. He

really loved that kind of aspect of it. Of course in San Diego we saw a number of the biotech opportunities that came along, but we also did IT things.

Duane had a very good friend by the name of Myron Eichen and Myron was a very successful serial entrepreneur on the IT side. A company that he organized that was on a rocket ship trajectory was a company called Brookside. I think it was Brookside, something like that. It was based on a strategy they call A to D, so it was Analog to Digital. They could do high speed, in those days high-speed conversion analog and digital. They made chips. I remember at one point the Jet Propulsion Laboratory at Cal-Tech had a program where they would go around and provide advice to technology companies in the area that needed it.

They came down to Brooktree, yes Brooktree maybe is the name of it. They exchanged some notes here. The guys got up and said, "Look we can't advise you on this. You can advise us. You know more about this than we do." And they were on the cutting edge. It was really an outstanding company. Qualcomm was getting started at that time as well. This [company] was every bit as hot a deal as Qualcomm, but it just never got there for some reason.

At that time Myron Eichen suggested Duane invest in a company in L.A., in Torrance and I went and sat on the board for them. Pair Gain was the company, it was organized by Bob Hoff at Crosspoint. Pair Gain was signal processing. When I was there it was literally in a garage. There were some people working on things, but it was Henry Samueli technology out of UCLA for signal conditioning. Their specific specialty was the last mile so to deliver, create a T1 line over a twisted pair of copper so you could have high capacity data transmission exchange. This was at the point where they were building all this infrastructure and the last mile was killing them.

They could use conventionally installed base with these converters without having to lay optical cable all the way into the particular houses. Very successful. Sold that for $3 billion after I had left Ventana. Samueli went on to form Broadcom without venture guys afterwards. There were some very interesting technologies in that day. But Duane's, most of his effort and focus was on—

Caruso: Medical.

Fleming: Medical of one sort or another. From 1990 on I worked with Duane and the emphasis was on medical. The first real biotech company I did was a company called Genesis Therapeutics. It was a gene therapy company based on technology suggested by Rusty Gage and Ted Friedmann who were scientists at UCSD. Ted was the senior and very early in genetics. Rusty was a young, up and coming

neuroscientist. Duane had invested early in Agron through his networks. The attorney at Agron was a guy named Gary Freidman.

And Gary introduced Ventana, at that time Duane and me, to Friedmann and Gage. I went over to UCSD to check it out and Ivor was talking to them at the same time. I remember it was in January of 1990 when I met Ivor for the first time – Ivor Royston who is now my partner. We both arrived and said “Okay, we want to do this.” Each one of us wanted to do it. Rusty and Ted went off and they counseled. They came back and said, "Look, we don't know anything about starting companies, we are scientists. We like you both and you are really different guys."

Ivor is a physician and academic and he said, "Look we want you guys to work together on it." That was the start of my working with Ivor. The company Genesis Therapeutics was a gene therapy company. The concept was to treat Parkinson's disease with implants. I can get into the technology if you want to. Essentially they harvested a punch biopsy, fiberglass from the skin, put in that a gene that they call Tyrosine Kinase (TKG), and then they implant that in the substantia nigra. They were able to provide the patient dopamine or whatever and it converted to el dopa. I don't know whether it was el dopa to dopamine or dopamine to el dopa – whichever. Elegant technology.

With Ivor's help we were able to bring Kleiner Perkins in to support that. And started the company, opened labs up on the mesa. That was in 1990. I was the initial CEO Chairman of the board, because I had four scientists who were all working at UCSD at the time. There was Ted and Rusty. Ivor was on the faculty at UCSD and then he had a colleague, Bob Sobel who was also a physician there, at the medical school.

None of them wanted to be listed as the CEO so I was everything, the CEO, chairman and all that stuff. Fact I can hardly remember Rusty coming to me, "A letter came to me addressed to Genesis Therapeutics. I don't want anything like that across my desk. I'll get in trouble." Boy. In those days in the university the tech transfer issues were a big deal. They have long since gone away. But they were real sensitive about that. We were able to bring Kleiner Perkins in in the fall of '92. Was it '92 or was the fall of '91? I think fall '91 we merged that into Hanna Biologics, which became Somatics.

And then I think they took it public at that point because as I recall it was a nice payday. We made three or four times our money on that in a couple years. I have to laugh, that was one of the few gene therapy companies that's ever made money or at least for its investors. There were there were three gene therapy companies. There

was Genesis Therapeutics. There was Gene Therapy Inc., which was Allen Walton's company back east. And there was Doug Jolly's company here– I can't think of the name. But those are the big three and as I said, we had Kleiner Perkins with us. So that was good. That was quite successful.

Caruso: Can I just ask a couple questions?

Fleming: Sure.

Caruso: Not too long ago you mentioned the difficulty of going into venture. Venture is focused on a lot of technology science. You were an English major. In the past couple of minutes you have been throwing out scientific terminology quite simply. And so I am curious to know how you managed to deal with a completely different sector from what you're used to. How did you become knowledgeable to be for example you mentioned writing, marketing prospectus, memoranda, how did you do that? How did you gain the knowledge?

Fleming: The writing at the venture level is financial writing so that is pretty straightforward. We are going to invest in these kinds of companies. Here are the markets for these things. What we expect to get in the way of returns. That is pretty straightforward. At the portfolio level—when we are dealing with individual companies—that is where the technology overlay gets pretty heavy.

At the onset I was looking at IT. I have looked at the integrated circuits. I see chips and certainly something like Pair Gain was highly, highly technical. I can remember looking at some early flexible chips where you imbed the dye, which is the actual computing part of the chip in a flexible matrix with three-dimensional wire and all that stuff, wow, CMOS and all that rigmarole. I just was sitting in the back seat with my eyes open on that.

And then at the same time, you would go over and talk on the biology side and it was just as complex in a completely different world. And I found the hardware/software world just didn't resonate with me. Just was not as exciting as the healthcare, the medical. I should say in terms of my academic background, I was a good student in science and so I took biology, chemistry, physics and I took the advanced track in those days. And being across the street from Cal-Tech, we had some pretty bright kids and on occasion we had the opportunity to interact. The guys would come over once in a while and provide lectures or talks and that kind of stuff. So I was pretty keen on science in general.

At Amherst I was a pre-med and so I took some biology, chemistry, and physics there. Not a heavy one, as I say, I was an English major. And I actually went so far

as to get accepted at USC medical school but I just had it up to here with academics so that is when I went up to be a deck hand and a few other things. But I was always a fan of that and so the biotech here was really intriguing to me. And I just picked it up.

For instance I wrote the business plan for Genesis. I could understand the business proposition and so I could write in a pretty straightforward manner. And then I would have the Bob Sobel who was my counterpart on the technology—he was a physician oncologist. He would write up the technical sections and I would put them both together and then he would check it and back and forth. But over the years I have to say I have had an absolutely splendid education in all kinds of technology and I have focused almost exclusively on the life sciences since 1990.

But with that said, I will say I never felt that I had an intuitive feel for the technology or I always felt like I was an expatriate. I can speak French and I can get along and order and I know the customs and all the rest of the stuff but I am not a Frenchman, right? And a Frenchman knows that immediately and the same thing here. I am not a technologist. And so I have always depended on them and I've always felt that I had a practical working capability but never the depth of understanding and that I can really take initiative and be creative in the technology. I can be creative in the business and the finance and that sort of structure but these people that can look at this stuff and say this is a hot technology.

Caruso: Okay. Part of my line of questioning is trying to understand how one decides whether or not something is something that you should invest in. As you mentioned, was it Rusty that didn't want to see the letter from?

Fleming: Yes.

Caruso: Scientists are not always known as the best translators of their own work. They understand the science but they don't necessarily always communicate what the significance is. And so it seems like you have to determine significance to figure out whether or not it's something worth pursuing. So I was curious how that process actually works to determine what should be pursued and what should not be.

Fleming: It is interesting, Ivor is an example but a number of the high profile venture investors are people with strong technology backgrounds who are there because they see the technology and the product and they are great with it. Put another way, they express their creativity through the specific resources in the embedded technology that they really understand and know. I'm a sailor so people

know a hot boat when they see it and that sort of stuff. You know a fast sailboat. And I don't have that kind of emotional attachment, intuitive sense as to what works and what doesn't work.

I have always depended upon a team to work with me and give guidance from the technical side. Now it's interesting, when you make those assessments, first off you have to be on the cutting edge. And you don't know that *a priori* because that is where there are problems, insoluble problems. What you want to do with these investments is take the next step. You don't want to be 20 years ahead and you don't want to be five minutes behind. But you want to be two steps ahead and you want to be where they are going to be in two years, three years or whatever. And so that's a very sensitive call. And that requires people that really have been in the industry and know the problems and limitations.

I was always intrigued that stuff I thought was easy was difficult for them to do if they just didn't have the technology, had not gotten there yet. Things that looked incredibly hard lots of times were pretty routine at that point. So I didn't have that inherent feel for the – because it is all about solving problems. And in order to really understand, you have to live with those problems. I never had that. The other element of it is that much of the work that is done, many of the resources are not focused on a dispassionate assessment of the situation, but an emotional thing.

And so what that means is that the resources tend to gravitate towards the prestige. And most of the time prestige correlates with quality but not always. And if you have a choice, take prestige because that is where the money is going to go—having the Kleiner Perkins name brand or having the Nobel Prize winner or whatever. And so again that is where technical colleagues or academic colleagues were very helpful for me because it was not a landscape that I really knew from the inside out.

And then a third element is that when I went in I thought that what we were trying to figure out is how to cure cancer or how to cure Parkinson's disease or whatever. That is only peripherally or indirectly associated with a goal. What you are really trying to do—especially on the biopharma side because the development times are so long—is provide a work in progress to the company that is going to complete the work and deliver it to the market. It is very unlikely that you are ever going to get a product on the market and sell it to anybody, an end user customer.

And so what you really need to know is fad and fashion in the pharmaceutical industry, more than a cure for cancer. You want to know what a pharmaceutical executive, or an R&D manager will pay you for. Again, that comes from knowing intimately, knowing the people sometimes in a personal relationship but certainly

knowing the nature of the pipelines and holes because it is like drawing to an inside straight. You are trying to plug holes in a pipeline in a lot of ways and the knowledge of those holes and what is needed and how these various technologies correlate with commercial strategies of the large corporations requires a very intense, profound understanding of that marketplace and again, I don't have that. I have to depend upon those guys. So I've always been very team oriented in my approach to the process, which may seem obvious but it actually probably more the exception than the rule in venture, any kind but certainly biology.

Caruso: I have one very specific question and then three that I think we will probably be returning to on and off. I just want to mention what they are because I think that will inform the conversation. You did mention that Duane was down in San Diego and you wanted to come to San Diego.

Fleming: Yes.

Caruso: Is that because you wanted to work in the biotech life science venture aspect of things or is there something else bringing you to San Diego?

Fleming: It is interesting. Tom Gephart's office at Ventana was in Irvine. It was about three or four blocks from the airport. It was a great location and that was the first generation of venture capital in southern California. And there were a number of firms that didn't have offices in that Orange County area and the theory was quite simple. You could put your office in Orange County. You were steps from the airport, so the venture guys always talk about how we invest within an hour, or two hours of the office. Well from Orange County an hour got you anywhere in San Francisco on an airplane. It got you all the way up practically to Santa Barbara but certainly through Los Angeles. It got you to San Diego.

It strategically just made perfect sense and it had a pretty robust certainly medical technology community in Orange County, still does. But what everybody found was they were doing all their deals in San Diego. This is where the entrepreneurs were. This is where the university was. This is where Salk and Scripps and whatnot. So it became pretty clear that my heart was with biotech at that time and San Diego is where the deals were getting done. So San Diego was strategically a great place. Even though geographically it was not as attractive as Orange County.

Caruso: Okay. Now I mentioned that I am going to have three questions I think we will return to because I think they are of interest. With Genesis Therapeutics you mentioned that you were CEO and lots of other things when it first formed in part because the scientists didn't want to deal with that aspect of things.

Fleming: Right and if that had shown up at all in the university it would have been a conflict. And again in that day and age the university business community was...there was a kind of Chinese wall there.

Caruso: Right and another one of the questions is that I am curious to know a bit more about the tech transfer at the time, especially with the university. Looming over a lot of the people coming into the community. And the third question, I'm curious how things may have changed over time from when you formed Genesis Therapeutics or when it was formed, what was its purpose? We think today or we hear today that there are a lot of people that form companies hoping to get bought out immediately. I'm wondering if that mentality was the same at the time or were people looking to start something small that would then become big? So those are the three broader questions.

Fleming: So let me see, there is the...

Caruso: Tech transfer relationship.

Fleming: Tech transfer relationship.

Caruso: Scientist as founders of companies.

Fleming: Yes, the role of the founder served in that. Then what was the second one?

Caruso: It was the scientists starting companies and not necessarily wanting to be management. The issues of tech transfer. And then what was the goal of that. And I'll ask the questions again.

Fleming: In those days, it was the early stages of tech transfer and so there was a great deal of heterogeneity in the process when you talk to different universities. And they were inventing a lot of the procedures and the processes. So the people were aware that there was significant value there. There was a great patent on a combinant technology. And it was at Stanford and Berkeley and I can't remember the names of the two guys right now. But that was the basic patent on recombinant technology.

As the basis of Genentech and whatnot, it made tens of millions of dollars or so for the universities. People were quite aware of the potential value of these things. In fact, they had a rather inflated view of what the value was as we all found out. But it was a hot topic. They were very concerned about conflicts of interest. So Ivor had

already started Hybritech and it was quite controversial, his role there in the university.

Was he using university facilities and resources for personal gain and whatnot? He actually even had an investigation at one point that he was cleared on. And then within the university there were concerns that the English department was not going to have access to these things and so this was a very sensitive topic. I remember Harvard did a study and it was like a three volume or a ten volume. It was a great big study that they did on how to do this and they made these rules and regulations and whatnot.

I can remember the UC system at the time because we did the early licensing out of that. They said, "You know, look, we can't afford the dues. We just don't have the resources that Harvard has to do this so we are going to take these as they come." Which actually turned out to be the better approach because this was an evolving situation. They needed flexibility. They needed to respond to all kinds of pressures because there was the people involved, the universities, the politicians, the general public. All these factors and these forces were coming to bear on that process. So having a flexible system that they could adapt and work on real-time rather than this immense complex, set in stone guidelines turned out to be a much better approach.

I think in those days the best approach of all was a woman by the name of Lita Nelson at MIT. She took the attitude that this was not going to make an endowment for the university, but rather the principle value of licensing for the university was the involvement of the community, getting their name out, activity for their scientist opportunity, another dimension to the academic experience and all that. So she made licensing as easy as possible and under very attractive terms. She was really the dean of licensing. There were various creations underway. There was a guy at Columbia, Jack – I forget. He was the complete opposite. He made it as difficult as possible. He had done one big license and then nothing else ever matched up to it. You could never get him to close a deal because he was always so worried about dotting I's and crossing T's.

UC was in the middle. We did a deal with UC, one with Scripps, one with Salk and all. Over time that process changed; people became a little more relaxed about it as long as it was just straight. We used to have to go up to Alameda to negotiate the deals. There was just a lot of legal rigmarole. It was like working through any kind of large contract; there was a lot more lawyer time than you even wanted to think about. But it was a fairly inventive process. Today it is much more of a plug and

play. But they treated it like any other contact and we just worked through it. That was UCSD.

It was a similar process with Salk for instance. We told the Salk, we were offering equity in the company or payment or whatever. In those days, Salk was so desperately in need of money, we offered them the stock. We didn't have a lot of cash. Cash was very tight in our companies. So we offered them– I don't know, $500,000 in stock or $100,000 in cash and they took the $100,000 in cash. But, we would say, you really should take the equity, because we always felt that we were partners.

We were not looking to exploit the universities in the sense that it wouldn't make any sense for us to profit at their expense because this is our territory. These are our neighbors. This is our long term source of opportunity for us. On the other hand, we had to get competitive deals in the marketplace. There was a balance in that regard.

Scripps was another dimension entirely. Negotiating with those guys you had to deal with a Richard Lerner. Lerner was brilliant and he built a magnificent institution over there. And he was keenly interested in the licensing. So if you could get a line to Richard, you would get anything done and if you looked crossways at Richard you couldn't get anything with Scripps. But obviously over time that eased substantially.

But people were quite cautious in that regard and I winded up then going to Sidney Kimmel who left the university. At that time he was working in Hillcrest and wanted to build a center up here and I think they got delayed. Ivor just got tired of making the drive down. He was an ambitious guy; he started the Sidney Kimmel Cancer Center. Much of the '90s, he spent building the Sidney Kimmel Cancer Center, which took a lot of the university pressure off of any conflict issues that he had. That gradually evolved over time to where it is today, where I think the universities have a much more realistic view of potential value for these things and a much more businesslike approach. Also I think that certainly in San Diego, the academic industry interface has evolved to where the commercial community depends very heavily on access to the research base. That is one of the fundamental strategic advantages that San Diego has in the high tech world and probably the reason that San Diego is a high tech center today. So the importance to the commercial side is absolutely undisputable.

From the academic side, I think that the perspective has evolved to where it is much more of a direct extension of the academic experience. It is another dimension. It is another way to engage in your technology. And you see this transfer back and forth.

In fact, you see it between the university and the biotech community and with the pharma companies executives will move back and forth from an academic position to a university, to a major pharma to biotech, back and forth. It is much more fluid and as a result, a much more creative and interactive community. That's really evolved in the last ten years or so.

As far as the goal for those companies, in the first half of the 1990's, biotech was what I call “big science.” This mold was set with Genentech, Brook Byers, Bob Swanson, Kleiner Perkins and Hybritech here in San Diego. And those were big, big science concepts. Genentech was recombinant DNA expression and Hybritech was monocle antibodies. That was sort of the vision. We had with Genesis and the underlying science there was gene therapy. And I should say that as elegant as that therapy was, it was not successful. Not that it didn't have the desired effect when we implanted it in patients, and in fact it was remarkable, it essentially cured the disease. But we couldn't maintain the expression of the implanted gene. The body responded to it, not exactly as an immune response, but it just shut down expression. We couldn't sustain expression, so it wasn't really a therapy.

They're still working on that to this day. When you go into these technologies, you just never know. We could have turned a card and had a gene therapy at that point and we would have been worth billions. The fact is, here we are 23-24 years later, and we’re still struggling with the same problems. You just have no idea. Those are the days of big science. So we were doing gene therapy. There are later examples of that here in town; Sequana did Genomics.

We did a company with Sydney Brenner and Richard Lerner at the Scripps called CombiChem was the name of our company. The technology was combinatorial chemistry for large-scale libraries. I can remember talking to a pharmaceutical guy. We had a presentation at Genesis therapeutics with one of the major pharmaceutical companies. I happened to run into the executive some years later and he said, "Oh I remember that meeting. I went back to report to the office. Look, I don't know what was in that meeting. I couldn't understand what it was we were talking about, but I knew these were the smartest guys I've ever sat down with.”

So that's what the science was. Gene therapies, genomics, these were new to the pharmaceutical industry. We were trying to create another Genentech, another Amgen, something of that nature. With that model, you could start the companies and in three or four years you could take them public. We were having these periodic windows thanks to Allen Greenspan. So about every four years you'd get a window. And that was about the time it would take to create this critical mass and

get them public and the public loved them. You know Millennium, Sequana, Solera, these companies had their human genome sciences. They were hugely successful early and then we weren't able to sustain it because the economics weren't there. The business models didn't hold up. But in those days it was big science that we were doing.

Caruso: Before I ask my questions, we were hitting around 1992 and I think you said you worked for Ventana until 1992. If we could pick up there.

Fleming: Yes. In January of 1992 and I had, Tom and Duane were difficult guys to work with at best. I was getting very impatient with them; come through on a number of promises they'd made to me and things like this. I was very taken with the success of Genesis. I essentially parted company with those guys. I'd been working with Ivor on Genesis and so I went to Ivor and said, "Look, let me help you do this stuff. You're creating these things. You got these interesting ideas all the time." At that time he had a little pool of money from family and friends and his own that he would invest as a venture guy around ideas and technologies that he really liked.

This was money he had from Hybritech, from Idec and people he had invested with. I helped him put together his portfolio. He called it Forward I. Forward was the name of the street that he lived on in La Jolla and so he called it Forward Ventures I. While we were doing that, I helped put together a venture fund, which is what I'd been doing in Ventana. So I put together a prospectus. We went around to raise money starting in the spring of 1992.

There was a woman here in town, Lisa Boyage and she had been working with Sequoia Capital. Sequoia was Don Valentine, Pierre La Monde in those days and they were one of the really hot – still are, venture funds in Silicon Valley. And they were IT. They did Cisco and some of these. They were interested in getting in at San Diego and into biotech in particular because they were always trying to keep up with Kleiner Perkins and vice versa. Lisa was the scout for them down here. Lisa introduced us to Sequoia and Sequoia put up the first million dollars for Forward. They said, "Okay, we'll give you a million bucks. You can use our name and then you can raise a fund on that.

We went around and scratched and scratched. We got friends and family. We got American Cyanamid. Well, literally Lapse, which is part of American Cyanamid. A guy name Arnie Oronsky. They put up a couple of $3 million and we just cobbled together a fund and we set a first close at $5 million. We got to like $4,700,000 and something. We were trying to bring in an attorney friend of mine and introduced

him to a guy name Frank Pearl in Washington. We were trying to get Frank to come in on this. He was intrigued and interested and was going to give us the $500,000 to put us over the top, but he wanted 20 percent of the management company. He was a really tough guy. He went on to do a bunch of other stuff and we could talk about that, but he was just a tough east coast Washington DC attorney. We just couldn't go there. There wasn't enough to feed a family. I can remember I was trying to get to a close. We had set the close, it fell through. We didn't have the money. We had a minimum of $5 million we had to get to and we were short about $250,000.

I could remember being on the phone with Ivor and explaining. He was at a little league baseball game. We were working on this thing and finally he and I just said, "Okay, we'll write the checks to get the thing over the top." You didn't have to put all your money at once. I didn't have any of that money, but you had to make a 10 percent first payment. Then you could just take your paycheck and use it to invest. So that got us to close and then once we got beyond that we were able to pick up a little momentum.

A real key element is the guys at Sequoia introduced us to a fellow by name of Tom Judge. Tom was at the time running the AT&T pension fund investment venture program and he was the absolute dean of all of the fund investors. He set the terms for the whole industry. I flew to San Francisco to meet him and we had a nice chat. He said, "Look, I'm investing in this not for one deal, but because I want to invest in a franchise here. I want to see multiple funds. I want to see you guys do this." "Okay, yes sir."

We got to $12.5 million in there in Forward II. The first close in April of 1993 and I was running it. I think Ivor was at the university at that time or he may have been at the cancer center. I don't know exact timing on that. We opened an office at Executive Suite just down the street in the complex on the northwest corner of Genesee and La Jolla Village Drive. That was our first office. It was focused on biotech and those kind of opportunities. Ivor was in university; he was in the cancer business. He was generating the opportunities and I was doing the business side of it and that's how we got started.

Caruso: Now you just mentioned 1993 and I'm curious if you had any involvement with CONNECT since that also started in 1993 as well.

Fleming: Just indirectly. I knew CONNECT, we were members, and, of course everybody knew Bill Otterson and you can see the stacks, things I think it was 1994 was the one I happened to show you– from the meeting there. So we would go to

the meetings. He had always been pretty supportive of that kind of stuff but I was never directly involved in CONNECT.

Caruso: What did you get out of the meetings? What was the purpose behind or what did you perceive the purpose of CONNECT to be?

Fleming: Well, all of those things, they are the glue that holds the community together, that makes you self-aware of the community. And in the venture business it is all about connections and access. Today you do a deal, you sit down in the morning, you've got to read five newsletters announcing this company got funded and that company got funded. None of that existed in those days. So the only way you could really keep track of what was going on in the industry was to interact with these groups.

Caruso: Kind of an in-person Internet?

Fleming: Yes. Well yes. I can remember, I was one of the early cell phone users. A great big clunky thing like that and no Internet, no cell phones, the big innovation was the answering machine.

Caruso: Clearly things are taking off for you in the early '90s. I'm wondering what your goal was or what Forward Venture's goal was in terms of going forward? What were you going after? What were you interested in? How were you determining what companies were the ones that you would be funding?

Fleming: Our goal was mainly to get involved with exciting, interesting companies, interesting technologies really in those days. For instance, Sidney Brenner at Scripps. We were obviously a small struggling firm in those days. The big flagships were Kleiner Perkins, etc. I remember, as an example, the guys at Sequoia said, "Listen, you know we found out about this technology at Scripps and we think you ought to take a look at it."

So we said, "Okay, fine." We had one guy name Peter Bic. It was early Quintiles. I never got along very well with Peter, but anyway he came down. We had these meetings with Scripps and the idea was combinatorial chemistry. I think Richard Lerner had talked to the guys at Sequoia and they brought in the group and they presented. It was Ken Janda, Sydney Brenner, Dale Boger, and there was an Asian guy who was a carbohydrate guy and I can't think of his name. But these guys are all top, top scientists, world-class scientists; primarily chemists.

We had the meeting and they presented and we talked about it. The guys in Sequoia said, "Gee, we really like this deal. We think you ought to invest in it." Oh okay, so

we, Ivor and I put the first money up, just walking around money and organized the deal and wrote the business plan. It was strictly our money at risk and Peter Bic came down periodically and finally said, "Okay get out of the way. We need to do this thing." So with their money and that process behind their name, then it started to be a real company.

One of the things that I always have to do in organizing the company was to get all the contracts in place. You would have to have your scientific advisory board, get your company incorporated and all that. I can remember that the scientist said we have to have consulting agreements with the Scripps and the scientists to work with us. And so here are some example consulting agreements. So we looked at them. Well, they were for CombiChem, the same company that I was in, they were going to do it with Kleiner Perkins. They had it all laid out. They had it all negotiated and then Kleiner Perkins got interested. I think Larry Bock over at Avalon, got them interested in a big company back east. And they dropped this deal. So the guys at Scripps had their nose out of joint and it fell into the lap of Sequoia who wanted to compete with Kleiner Perkins. So we were the ones who stepped in and sort of took over that process. And it was funny when we saw what was driving the whole thing after we got all through.

Those are very exciting. Sidney went on to get the Nobel Prize and so that's the kind of thing we were chasing. We did some interesting companies. We had a company called MitoKor, mitochondria genomics, which was ahead of its time. There really hasn't been a mitochondrial company, but there are probably dozens of them today that are trying to do what we were doing working in the '90s. So again a very tough target that's taking longer than we thought to get, but strategically it was a brilliant move, but it was just too early.

Probably the most exciting company we did in that fund was a company called Triangle Pharmaceuticals which was Karl Hostetler, who is a scientist at UCSD. He developed some early drugs. I think he did antibiotics. But he had some technology and we were talking to him.

In fact it is funny, it's a pro drug. They call it pro drug technology which is where you take your antibiotic or in his case antivirals. Lots of times those are very insoluble and difficult to get in. You put something like a lipophilic on the front and then that will help it go in through membranes, making it easier to get into where you want it to go. Carl had some very elegant technology in that regard and we had been talking to him. We couldn't advance the ball. We got to a point and I kept saying, "Carl, I needed some more data." And so we were stuck.

Then he said, "Listen, let me introduce you to this friend at Emory named Ray Schinazi." Ray had worked on nucleus side technology, which is the offspring of AZT. And these guys, the whole chemistry department, Dennis Liotta, Ray Schinazi, and David Chu had really remarkable library of these antivirals, the early HIV drugs. So Ray came over and we got to talking and put together a business plan around a company. I forget what we called it. But just at that point Burrough's Wellcome got acquired by Glaxo. Burrough's Wellcome was the group that had developed AZT and a bunch of other drugs. The president of research for Burrough's Wellcome was a guy name Dave Barry and Dave was a pretty opinionated, strong-headed, individualistic guy. He was uncomfortable going with Glaxo because he was going to get subsumed. Glaxo was the big fish acquiring, Wellcome the small fish. So Dave's situation and his whole team was a bit unsure. Even though Glaxo is larger, David said they made more drugs with less money at Wellcome than they did at Glaxo. So the Wellcome guys were not going to be happy taking a back seat to the Glaxo guys.

We talked to Dave and said, "Listen, we got a business plan. We got Ray. We got these molecules here. We're all ready to work. Why don't you come out and we'll see if we can get this thing funded." So we got the entire Burrough's Wellcome antiviral team, which was the absolute best in the industry at the time.

Then Carl introduced us to Tony Evnin at Venrock. I think Ivor knew Tony because of the Hybritech days and Kleiner Perkins. So we founded Triangle Pharmaceuticals. Dave and the team was in North Carolina so we did it in Raleigh Durham. And that was a very successful company, but the real key to that company was that there were two second generation AZT molecules. One was FTC and the other was 3TC. Glaxo had 3TC and Wellcome had FTC. And when the acquisition, the Federal Trade Commission told Wellcome that they had to get rid of one of those drugs. So we were able to acquire that drug at Triangle. And I tell you, Dave Barry was absolutely brilliant. He is a genius. He really knew how to do clinical development.

The Glaxo drug 3TC was a twice a day drug. So Dave developed FTC as a once a day drug. When we got that approved, or we didn't, there are a whole bunch of Ventures in Triangle that we can get into but what it amounted to is that we were running a trial in 2001. We got the results. It was a year-long trial, but the Data Safety Monitoring Board took an interim look after six months and said this drug works. It has already been statistically significant. It has proven its worth. There's no point in continuing the trial. So the drug was doing a spectacular job. It was virtually guaranteed to get approved.

So that was great news in a drug approval, except it was right when the Internet bubble burst. There was no money available, no money at any price. We made the announcement that the trial was stopped; the drug was successful; the price of the stock didn't move an inch. In this day and age it would have just flown through the roof. We couldn't raise the money that we needed to market the drug. And then Dave died of a heart attack, which was terrible. It was just a tragedy. I still think people didn't really fully understand the value of what we had at the time.

We ended up selling the drug to Gilead. I can remember the guys in charge of negotiation and originally Gilead was going to give us the sales price of $480 million. Gilead was going to give us that in stock and he came back and said we talked, you know this, Gilead stock has doubled in the last six months. He said, "We managed to get this in cash. They're going to pay us in cash. We got rid of that stock." Holy shit. Gilead's in a 50 or 100X since then so that was another brilliant move.

So we sold that to Gilead. Gilead turned it around and put it on the market. It's called Emtricitabine [Emtriva]. I think that they have used it individually but they have also used it in combinations like Truvada and it has just been spectacular. The drug has probably accounted for over a billion dollars of sales every year since around 2003. We sold it for pennies on the dollar. That was really spectacular and was a real flagship for us and helped set up the fund for the next fundraising. That was Forward II and that was 1993 fund that was pretty fully invested by about 1996.

Caruso: You mentioned some of the other VCs that you've worked with, knew, or were involved in some respect with some of the deals that you were interested in. What was the landscape like more broadly in the San Diego area for VCs? Was it very populated? Was it sparse?

Fleming: San Diego has always been somewhat thin. The real heart of the venture community has always been Silicon Valley. Most of the money that came in here in those days came from Silicon Valley. Again, it was two hours from the office. They could get here on an airplane, so that was essentially how they got back and forth.

But that created an opportunity for little startup venture groups like ourselves who were willing to roll up our sleeves and do the heavy lifting involved in organizing the companies, babysitting, getting the staff together, operating it and all that kind of stuff. Then these guys could do it on a portfolio basis. We could help them be efficient in the early stage. In those days, most venture was startup activities. As far as other groups in town Avalon was here with Kevin Kinsella and Larry Bock. Larry went to UCLA. He was a year ahead of me. I was class of '86, he was '85. He went to work originally for a fund in Orange County called Oxford and hooked up with

Kevin, probably around 1990. Now Kevin did these big deals, the kind with somewhat of a theatrical flair to them. He did those in Boston, all over the place. He didn't do a lot of stuff in San Diego, certainly not in the early days. There was Ventana, but Ventana was always a fringe or marginal player in the community. There wasn't a lot down here in the way of venture groups.

I'm sure I'm overlooking some. Enterprise. Now Enterprise was started up in Orange County. I forget the guy, Chuck somebody started it and then he hired Drew Senyei. Drew was an OB on the faculty at UCI OB/GYN. They moved that down here and he hooked up with Jim Berglund and then Bill Stensrud. So that was Enterprise; they were here during that time.

Caruso: Has that changed at all over time?

Fleming: Well, the only really active of that whole group is Kevin's group, Avalon. Both Enterprise and Forward are in a retirement mode at the moment. We've come full circle and are making his own personal investments again. Today groups like Sophie Nova and Thomas McNerney have an office here. There are a number of groups that have offices, but as far as mainstream headquarters, Avalon is certainly the principle one.

Caruso: Do you think that's having an effect on the technology community itself here? If you don't have funding you really can't start a company. So have you seen a change? Are people going elsewhere now to start their companies?

Fleming: Well, that always happens. The rule of thumb was always that the company ended up where the CEO wanted to put it. So we would start the companies here, but if you got a hotshot CEO who could really raise money and he was willing to do it, he could put it in Seattle. Triangle is a good example. When we got the Burrough's Wellcome team, we put it in North Carolina. That's where they live; that's where they wanted to be. They could recruit out of Glaxo there, so it made sense.

But you do have an inherent advantage if you are the starting. In fact, I was just talking to Jay Flatley from Illumina the day before yesterday. Somebody was saying, we certainly hope you can maintain the company here in San Diego because a lot of our good companies – Lifetech being one example – get bought out and taken out of town. He said, "Yeah it is funny. When I first came down here to take over Illumina, I wanted to move it to the Bay Area where I lived, but it's a little too big to move. It was like five more people than you wanted to move. So he moved down here.

So you do have an advantage if you start it. Once you get beyond critical mass then you do have a presence. In that transition to where you are trying to get to your first real management team, it really goes where the CEO wants it to go. San Diego has a great technology base and that will always, it has always attracted financing. It has got a good now installed base of execs and whatnot. Would it be better if they had a similar venture community with the same sort of breadth and depth of a Boston or a Silicon Valley? Yes it would, but we can survive with what we got.

Caruso: You mentioned the importance of a CEO and where the CEO wants to set things up. I'm also curious, you also need just workers, engineers, scientists. Are those readily available in the community or do you need to pull them in from elsewhere?

Fleming: It depends upon the specialty that you need. In general, San Diego has developed a very robust technical workforce base here and, of course, people don't like to leave and so when companies get bought or fold up or whatever, their first instinct is to try to survive as a consultant until they can find another situation here. In the old days, recruiting, this would be like going out the dark side of the moon. That is not the case today. San Diego is very much of a center.

With the Internet and with the real-time, there is a much more virtual community. The fear that everybody always had in the old day was if the company fails or you get laid off, then you are stuck in San Diego and you have no networks, no connections and whatnot. Now those networks and connections are not necessarily geographically constrained. So that we can compete quite effectively.

Caruso: I was just taking a look to see if I had any more questions that I wanted to cover. I know also we have gone a bit longer. I actually don't have anything that comes to mind. I do like to give the interviewee's a chance. I came out with specific purposes, specific questions, but there are some things that I may not know to ask you about and so I would like to turn it over to you to see if there is anything that you would like to talk about that I may have missed. It is okay to say no but I like to make sure that you have a chance.

Fleming: I wonder how many times you get no from that. A) This is a pretty articulate community and B) I'm probably as talkative as anybody as you, as I'm sure you found out. I think it is interesting to focus on the early stages of the community and my career because I think that's kind of most historic here. There is still a lot. We are up to about 1995 and there is still a lot since then. We are probably both getting tired here. If we want to go back and do more, we can do more.

But just to give you a little view of where things went from there. We raised our third fund. The first fund is $12.5 million, raised in 1993 and that fund was quite successful with Triangle and whatnot. I think we got about 18 times our money on Triangle and that was a relatively small amount of money, but it was a good return for the fund. That fund we ended up turning about 4 times the money got. We had an internal rate of return over between 35 and 40 percent. The funny thing about it is in those days the venture business was so productive, that was not even really a top quartile fund in those days.

The Sequoias and the Crosspoints and the Kleiner Perkins were just getting these huge returns for these things. Now that all changed in the next fund was a $42.5 million fund in 1995, '96 called Forward III. And that was a disaster. We did not know it at the time, but what had happened is that we continued to do biotech and biopharma. The Internet was emerging and suddenly all of our major sponsors in the bay area that we depended upon for the follow-on funding to really develop these companies; the Sequoias, the Kleiner Perkins, the Accels and these guys, they stopped doing any life science investing. They all went to the Internet. So that was very difficult. By '97, '98 essentially there was no future in the business.

Then Allen Greenspan bumped the money in 2000. The market took a jump up. Technology became hot. And the biotech world began, shifted from just big science, combinatorial chemistry and that kind of stuff to what they call platforms. So a platform is an enabling tech, such as gene therapy that can make a whole bunch of products based on gene therapy or something. The market really went whole hog for platforms. A classic one, can't think of the name of it right now, was these gene chips that the arrays where you could look to see at a – you could take a sample from a cell and you could tell which proteins were present and not. So you could see what the cell was processing, was working on. And that was an example.

They had a number of these. And they went through the roof. At that point I had introduced a friend by the name of Jeff Sollender who had made a number of investments in this area and so Jeff came on the team. He just hung around the office and then we put him to work. Then we combined the portfolios; we went out to raise our third fund—technically our third fund—the name of it was Forward IV because Ivor's fund was a personal fund. We raised that in 2000 and at the top of the market that was just flying. We were able to raise $256 million in that. And that was just spectacular. That was Ivor, Jeff and myself. We put a lot of that money to work fairly quickly.

Things were pretty active in those days and then we raised Forward V in 2003. That has been a long haul because the platform bubble burst, genomics and whatnot. The focus in the industry shifted from platforms to products. These companies that started as platforms we thought we could sell as drug platforms, development platforms. Turned out that pharma was not interested in buying the platform. It gets back to my comment about finding out what they want to buy rather than what will cure cancer. So they were not interested in buying the platform. Nereus was another platform. We had to invent the platform and then discover products and then take them into the market. We discovered some really excellent products.

Both the Nereus and the Ambit compounds are going to have a major impact on some really serious cancers that cannot be treated today. However, we were in Nereus for 14 years. We have been in Ambit since 2001 so have gone 13 years. The timeframe is just way too long, too much funding because of this shift in the strategy. It was very difficult. That shift to products stretched out the timelines, required much more financing, and hurt the returns to the industry. At the time when companies like Nereus were really getting ready to go into the clinic and make a headline, we had the meltdown so funding became very tight. The 2000s were an absolute brutal decade for the industry and for those funds.

Now we are seeing a kind of renaissance and it will be interesting to see how far it goes and what new models arise. We are seeing both platforms and products today. The concern is, as far as I can tell, we have not really seen a definitive business model that can provide sustainable returns to the industry. So it will be interesting to see where it goes from here forward. Whether it lapses back into struggling with the challenges of pharmaceutical development in general, the high risk along time or whether the few surviving venture funds have really figured out how to make money in the industry in a sustainable manner. It will be interesting to see, but it is still a very difficult time in the venture community despite the enthusiasm in the public markets.

Caruso: You have mentioned a few times about the effects that the market has; upswings, downswings, those sorts of transformations, Greenspan, every four years, etc. There is money to fund companies, but it is always that the science has to exist in order to form a company around it. I was curious about government funding and the ebb and flow of that, if you have seen that have an impact on the types of companies or the types of companies that people want to develop. Or have things over the past 30 years really been independent of what the government was putting into science and research?

Fleming: Well, no. The whole community depends on the government. The governmental funding of basic research is the foundation on which the advance technology community in general and certainly the bio life sciences community is based. Without that we just would not have it. Things like the Hatch Waxman Act that enabled us to work efficiently with the universities for licensing and things like that was very key. However, the benefit of that is cumulative. That is a long scale, long wavelength process.

So it's not subject to the immediate ebbs and flows of that and also the breakthroughs are a completely stochastic process. It is just random. It isn't that if you invest $100 million you get one molecule, and $200 million you get two, and so on. You invest a lot of money and then bam, something happens and bing-bang and things pop up. They are by nature unexpected. That is the breakthrough kind of thing. So it doesn't correlate immediately with the inputs. It is the outputs that matter. Again it is this base that's been built up over many decades that is the productive base.

So the effect of disrupting that flow of funds, I think will turn up over a much longer term. It is going to be much harder to measure that in real-time. Restricting it can have a potentially devastating effect. Now maybe there will be other ways to fill in for that, foundations, but I don't think there is any substitute for the government investment in basic science. That is an investment in the future of the country. This is a technology-based country.

Long ago we made our commitment to science as the basis of foundation of civilization. That investment in basic research is our investment in the future. You take that away and I don't think that the biotech community, I don't think that the venture community, I don't think the foundations are going to replace it. We do very different kinds of things. So I think in the long term that can have a very damaging, devastating effect. But that again remains to be seen. It is probably not going to be my problem anyway.

The venture business is responsive to the financial markets. It's affected by two things. The biotech venture is responsive to the underlying process of drug development and that is a 5, 10, 15 year cycle. That's the technology base. And then overlay that on the finance, less the technology base. The financial side is driven by the availability of capital in the economy for high risk; it is the marginal dollar in the economy. When somebody like Greenspan, Bernanke, Yellen or whoever prints a lot of money, eventually when they filled up everything else that can be filled, some of that money spend spills over to the advanced technology.

We are very good at soaking up, taking money out of circulation for relatively long periods of time with long-term payouts. That is a good place to put excess money. That accounts for this window that we have. Whether that is sufficient or how that relates to the underlying premise of investing in pharmaceutical development or innovation as we do, I think it takes more than that. I think we still need the business models to get from the inception, the early investment to a commercially viable programs that can participate in public markets and be acquired.

That is a real challenge because I don't think that they are testing models on some things. They are doing some experimentation today and trying on it, but it's not nearly on as broad a scale as it needs to be. The institutional guys are not going to fund that. Pharma is going to have to step up and to date pharma has not. They have been more than happy to pick the fruit, but they have not shown any inclination to help cultivate the vineyards or plant the seeds that you need.

Caruso: I'm asking your perspective on it. Obviously you are not part of pharma, but do you think it is possible that pharma is not interested in investing because it is much easier to let others invest and then just take the product or to try to buy up?

Fleming: Well, yes, short answer. Ten, 15 years ago, pharma thought they could develop it all themselves. Today they are going around seeing that their productivity has been woefully inadequate. So now they are more than happy to buy it. They look around. They can see things to buy. And the reason in some cases, they are beginning to see that they need to start cultivating startups.

So you see some corporate partnering, corporate venturing. You see some interesting experiments being done. Avalon here in town has a very interesting parallel investment program in place with GSK. Atlas and Boston is doing a number of things with Sanofi and some of those things. But it's just tiny, it's just a minuscule effort. They just kind of beginning to put their toe in the water. It has to be done on a much larger scale because the venture industry that provided, that started the companies that they are harvesting today doesn't exist anymore. It's about a third to a half of the size and it's changed its focus in a lot of ways away from early stage, much more toward later stage.

So I think there's a real possibility that if you run out five and ten years from now where the seeds that are being planted today are going to be harvested by pharma, you're going to have a shortage of material. So pharma needs to be encouraging the planting of seeds. Pharma can't do it itself. It has to partner that with the venture community. That's a new potential role for the whole program and it's being tried. Like Avalon here is a good example. But pharma needs to aggressively scale up those

efforts. They need to do it quickly because the timeframes here are such that if they don't get those in the ground in the next two or three years, they're going to start to have, I think, potential of a significant shortfall in the future.

The other element of it is that the financial operating venture overhead required to do things on scale. You can't learn that in school. That's an apprentice sort of job. And generations of venture guys are essentially going away. The current industry is so narrow it'll take years to rebuild that industry to where it can really support a level of innovation that I think pharma requires. I think it's really incumbent on pharma to be more aggressive in building bridges to the venture community, trying experiments with funds and whatnot. I'm writing some articles along those lines and I've been talking to pharma.

Oh yes, I can tell you, thankless job. Talking to anybody in a large corporation in any ilk in the United States five and ten years out is probably pretty thankless job. Very few people are focused on that. It's a quarter to quarter existence and the next quarter's numbers is what's really on everybody's mind. And boy, that is a 10 to 15 year development business; potentially a very destructive mentality.

Caruso: Yes, if the long-term goals are not looked at or thought about then there would be no long term.

Fleming: Absolutely. Absolutely. The industry still has yet to figure out how to develop new drugs. There's a concept called e-rooms law. So Moore's law is the –

Caruso: Doubling of…

Fleming: Yes…the capacity of the chips. So Eroom's law is the biological or the life sciences pharmaceutical equivalent. So it's just Moore spelled backwards. And what it showed is a steady decline in productivity since 1950. So while IT has become progressively more productive, life science has become progressively less productive. You start extrapolating some of those lines and numbers, it really is scary and you know that. So the interesting thing is that is a potential for an entirely new world order in the bio-venture life sciences pharmaceutical community. Pharma hasn't focused.

Like you are running a big corporation. First, you got to take care of today and then tomorrow. By the time you get out five and ten years, it gets pretty low on the priority list. And these things in the biotech world have always just evolved. People really haven't spent a lot of time planning these sorts of strategies. I think they are going to have to give it some specific thought and really plan. Because I think if the

evolution is allowed to run in the direction it's going, it ain't gonna get there. Interesting, it's always interesting times in this business.

Caruso: So is there anything else you'd like to talk about?

Fleming: We could talk about the 2000's and how to run a venture business and all that.

Caruso: Whatever you are comfortable with. I normally sit through very long interviews, but I know you have things to do so I don't want to hinder you.

Fleming: You know David, as I say, I think the best thing to do is maybe revisit another time and I can fill you in on some of the more details of the last ten years. It has been pretty interesting. But I'm getting tired and I'm tired of listening to myself.

Caruso: All right so we'll stop there.

Fleming: Okay.

END OF INTERVIEW

Recommended Citation:

Fleming, Stan. Interview conducted by David Caruso, March 28, 2014.
The San Diego Technology Archive (SDTA), UC San Diego Library, La Jolla, CA.

The San Diego Technology Archive (SDTA), an initiative of the UC San Diego Library**,** documents the history, formation, and evolution of the companies that formed the San Diego region's high-tech cluster, beginning in 1965. The SDTA captures the vision, strategic thinking, and recollections of key technology and business founders, entrepreneurs, academics, venture capitalists, early employees, and service providers, many of whom figured prominently in the development of San Diego's dynamic technology cluster. As these individuals articulate and comment on their contributions, innovations, and entrepreneurial trajectories, a rich living history emerges about the extraordinarily synergistic academic and commercial collaborations that distinguish the San Diego technology community.