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University of California
Berkeley, California

Moshe Alafi
BIOTECH PIONEER AND ENTREPRENEUR

Interviews conducted by
Sally Hughes
in 2003

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Interview 1: April 7, 2003

[Begin tape 1]

Hughes:

Mr. Alafi, let's start with your grandparents on both sides—who they were, what they did, and where they lived.

Alafi:

Well, first of all, we are Jews from Baghdad. The origin of the Jewish population was taken from Israel by the Babylonians and brought as slaves to Babylon. Supposedly they lived there for the last two thousand six hundred years. People think they might not have intermingled or intermarried. One proof is, their practices—religion, customs—were not diluted. If they did intermingle, they would have been diluted. As a matter of fact, there were Jewish Kurds in the north of Iraq who were even more Jewish in terms of customs; they have customs not even today practiced elsewhere. For example, today all over the world when people say they eat kosher meat, they take the lung of the sheep after they slaughter it, inflate it, and they see if it deflates. If it does, that means it has a hole, which means it has tuberculosis, and then they don't eat it. They sell it now to the Muslims, who buy it. For those people in the north, that's not enough of a test; they even open the brain and see if it has hemorrhage. If it has hemorrhage, they don't eat it either. So that's two tests for their definition of kosher. That's just an example of evidence they did not intermarry or intermingle.

However, those Jewish Kurds, where now they are fighting [the U.S. war on Iraq was in progress at the time of this interview], a lot of them were fair-haired; some had blue eyes. And they had been like this for generations. People were wondering why, and the best interpretation I've ever heard is that when the Romans were going through the old Iraqi states, they raped all these women. The children of a Jewish woman are also Jewish, and that might be some of the explanation.

Hughes:

Interesting.

Alafi:

Anyway, my grandparents were in Iraq. Some of them were in southern Iran, near Basra, just across the river. During the Ottoman Empire, they were all under one emperor, even though Iran existed. My brother [Joseph Alafi] has one post card; I wish I could get it. He told me there is a city in the southern part of Iran called Abadan, an oil city, and there's a whole square called Alafi Square. That's where they lived. Because Jews all over the world historically could not own land, in Europe for example, they always became either traders or professionals.

My parents and grandparents were traders in commerce. There are big names in the world, like the Kadouris in Hong Kong (they own practically all of Hong Kong), who are from Baghdad. The Sassoons in India are from Baghdad. The Harpoons in China all are big names. There is a story about a Harpoon who had a Chinese wife, and they couldn't have children. But they adopted eighty children, and then he died before the revolution, sometime between '45 and '49. I remember hearing from my father [Heskel Alafi] that after the war, everybody from Baghdad

who was any relation, even not related to a Hardoon, went to China to claim the money. As a matter of fact, my father had one partner who was a real Hardoon, and he was there with attorneys and all of this because they tried to get part of the inheritance from the wife, and she was fighting them. Then the Communists came and the whole thing came to an end. I saw one of the Hardoons in New York in '51 or '52; he came back from China. So these are their stories.

Iraq had about quarter of a million Jews when I left. They were the professionals. They were the physicians, and they were the merchants, and they were in the import-export business. That's what my father did. My father told me when he was a teenager he used to go with his father [Joseph Alafi] to India, and they would buy merchandise and bring it back. My grandfather would go to a factory in India and say, "You have this merchandise; it's a dollar a yard," let's say. So he wired back and said, "I have a hundred thousand yards for \$1.10 [a yard]." He'd tell those people to ship it, and he got the ten cents. So my father was in the trade since he was a teenager, and he'd go to Bombay with his father to trade. Subsequently, my father was in import-export from England, from Japan, from India, in the textile business.

Hughes:

Always textiles?

Alafi:

Yes, that's all he did.

My mother's side was the educated intellectuals. They traveled all over the world. My cousins on that side were people who read and had newspapers from everywhere. There were Arabian schools, but the Jews always had their own school, because the other schools were not good enough. I went to a school called Alliance Israelite Universelle, which is a French school, headquartered in Paris. They have schools like this all over the Middle East and northern Africa. That school was great because we learned everything, practically, in French. Seven hours a day—four in the morning and three in the afternoon. We had history, geometry, calculus, solid geometry, physics, chemistry. You took the exams at the French embassy, the same exams that are given in Paris, so you could go to a French university.

Hughes:

This was a high school?

Alafi:

Yes, high school equivalent.

Hughes:

What did you speak at home?

Alafi:

Arabic. But in school we learned Hebrew, French mostly, and English.

Hughes:

The instructors were French people?

Alafi:

Eighty percent of them, maybe. They had one English guy. We had a Kurd for Arabic, because we had to take an exam in Arabic from the government. If you don't take it, they take you into the army. But once you take that exam, they have to take you as an officer. So all the Jews want to take the government exam too, which was easier than the French, because the government does not want Jews as officers.

Hughes:

So you got out of the military that way?

Alafi:

Yes, but they tried to increase my age in order to take me earlier. It was a mess. They messed with my passport, but that's a different thing. It was such a school that the prime ministers sent their kids there sometimes. And there was an equivalent to it for Jewish girls. The Arab girls mostly wore head veils. But the educated ones, even the Arabs, didn't wear veils. The girls at school also didn't wear veils. Jews didn't live in a ghetto, because a lot of quarters were Jewish. But then the middle class and the upper class moved out near the rivers. I was just looking at the maps they're showing [on television in relation to the war]. We used to live close to the river, and the king's aunt used to live close by.

Hughes:

The Jews chose to live together in certain places, but it wasn't that they were forced to do so?

Alafi:

Right.

Hughes:

What about assimilation?

Alafi:

None.

My wife [Ginger Alafi] was asking me about suicide bombers. In Baghdad, they don't commit suicide; they kill. And I think that's why Saddam Hussein—the Arabs are saying they brought people from Sudan and Nigeria and Iran and Syria. Those are the people who commit suicide. And I don't know why that is.

Hughes:

For religious reasons? Jihad?

Alafi:

I did see twice, right in the street, people fighting, and the guy cut the other guy's throat. And then there was one occasion, I was walking near that Rashid Street they're talking about [on the news]. I was in my early teens, and there was a man who saw a veiled woman coming down from a hotel. He lifted her veil; that was his daughter. It seems she ran away with some guy. He cut her throat, and then he told all of those people that he avenged his honor, and they all clapped. They took him to jail, maybe gave him a year. So that's how violent they are there.

Hughes:

Since we're talking about Baghdad, and the war is going on as we speak, do you want to say a word about how you feel about your former city being attacked?

Alafi:

The Jews were always persecuted. During the war [World War II], there was coup [in Iraq] that was pro-German. They kicked out the king, who was young, and the pro-German government came to power. The Germans came with planes, and the Mufti of Jerusalem was in Berlin. We used to hear him every day. He would say, "The Germans are going to come, take Israel, and massacre all of the Jews." The Jews in Europe were being massacred then, and we knew it. When there was that coup, a pro-German government came, Rashid Ali—I still remember his name. The government came to all houses and asked, "How many Jewish people are in each home?" because the Germans were going to take over and kill them.

The British came all the way to Baghdad and encircled the city. They had with them the Jordanian army, because the British were in control of Jordan. They brought an army that looked like the Iraqis in everything—the way they dressed; the way they talked—and they almost surrounded Baghdad. The Iraqi army didn't know who the hell those troops were. Were they the Arab people rebelling? So the whole government collapsed, and the government escaped, and there was a vacuum for two days. In that vacuum, the Arabs went to Jewish homes and started killing men, women, and children. Then the people from surrounding poor neighborhoods started looting their homes. That saved the Jews, because everybody started looting, all of them.

Two or three days later, my father and I went walking. I had never seen in my life heads without bodies. They were all Jews that the Arabs had cut up. The pro-German government left when the British came in, and the British brought back the monarchy. It lasted until there was a revolt against it in '58 when the king was massacred in one of his palaces. Then there was a series of military coups, one after the other, and Hussein came in in '79. So, the Jews were always persecuted. We came home as school children at least once a week bleeding or with a torn shirt on. I have relatives who were massacred there. Yet the Arabs themselves really as individuals are friendly, generous, hospitable, more than any you would think. But then they are raised and taught to hate. And they are not educated, a lot of them. Hate against Jews, hate certainly against Shiites. They killed a million Muslims. Then against the Kurds, against the Armenians. Now especially it's coming out, with the words "infidel" and "Jihad" that they are building an idea again—Islam against anybody that's not Islamic.

We were taught in the schools the following: how did Islam go all the way from Spain to China? Because those people really started pushing Islam with the sword. They were taught when they were six, seven, eight years old, if you are killed, you go to heaven. So all the non-Muslims thought that these guys must be insane. You know, they are throwing themselves at the sword. They were scared of them because they were such fanatics. And I remember at that time, we used to laugh—will they really do it? And now they really are doing it. I still remember the saying, when the Moors were almost being kicked out of Spain after many centuries, one of their military leaders burned all the ships in Gibraltar, and he said, "The sea is behind you, and the enemy is in front of you, and you have nowhere to go except forward." And we were taught that since we were kids. And that's what Saddam Hussein is telling his people.

We knew about that, and that's why we went to a French school, and we knew that we would leave the country when we finished school. I have relatives who studied in England and in the States, and I knew I would go to Paris, London, or the States.

Hughes:

Not just the Alafis, but all the Jews?

Alafi:

Yes. The Jews have a prayer: "Next year in Jerusalem," they pray one day they will go back. But the ones who were educated always knew they were going to leave.

Hughes:

Tell me something about family life. How many brothers and sisters do you have?

Alafi:

I had one brother and one sister. But usually the Iraqi Jews have more children—not as many as the Arabs. The Arabs had six, seven, eight. It was a good life. We used to travel every summer to Lebanon—Damascus—and spent a beautiful summer.

Hughes:

Because it was cooler?

Alafi:

Cooler. Beirut was on the sea; it was warm. But Lebanon in the mountains was really beautiful. I still find some people from Lebanon and then ask them, "Is it really that beautiful, or am I remembering wrong?" They say, "No, it was really green."

I used to go to Israel to see my parents, but they died. But then I have other relatives there. I have an uncle who came to the hotel in Tel Aviv when I was there two and a half years ago. He was ninety-one years old and had eight or nine children. He was in tennis shoes and running better than I can, and he still didn't wear glasses. I don't either. His mother died when she was hundred and eight.

Hughes:

My heavens.

Alafi:

My mother died years ago, and my father remarried and had children and grandchildren. When I visited my father, he said the following "One day I'm going to go and see my mother." I thought he was saying he was dying. I said, "Why are you talking like this?" He said, "Why, she's right there." I said, "Where? I thought she is dead." I assumed she died fifteen, twenty years before. "No, she's near here in Ramat Gan. You need to see her." So I went there with my daughter.

[Begin tape 2]

Alafi:

When I wanted to take a photograph of her, she said, “Just a minute.” She buttoned her pullover and then put on a scarf. Then she said, “Now you can take it.” And I said to myself, “What vanity!” I went to Paris, and I had dinner with the wife of a scientist. I told her that story and that I had said to myself, *Quelle vanité*. And she said, “Non, quelle dignité.”

Hughes:

That’s wonderful.

Alafi:

She died when she was a hundred and eight. I told my sister in Canada, “Did you know she is still alive and a hundred and four?” My sister said, “No, she’s lying. She’s a hundred and two.”
[laughter]

At one time, before the end of the war, I belonged to the Haganah, the Jewish defense, who were the underground in Israel before the British left. They used to send people to Baghdad and train the young people for self-defense. It was exciting to belong to it. They were training us with guns, and if the Iraqis find a Jew with a gun, they hang you. And they did that to some of my friends after I left.

During the war, a lot of Jews were running away from all over Europe. They wanted to escape and go to Palestine—Israel. We had them hidden in our home. I remember my father saying, “We’ll all be hanged! What are you doing?”

Hughes:

Was your father in favor of Haganah?

Alafi:

If he knew, he would have said, “Don’t do it.”

Hughes:

It sounds like a rather dangerous young life.

Let me ask one more question about your family, and then we’ll move on. Give me a feeling of what your mother and father’s personalities were like, how close you felt to them, and how much of an influence they had on you.

Alafi:

All the family is close; they would do anything for you in the world. They were different. My father was a street-smart business guy. My mother was relatively more educated and more refined. She was the one who was saying go to school. All her relatives traveled all over. So it was two different worlds. We had both. You have to be able to survive, no matter what, and that’s what my father had to do. And there is the more—I don’t want to call it spiritual—part of life. It has beauty, it has art, it has travel, it has education, it has music. We lived in both. We used to go more to relatives on my mother’s side because it was more exciting. They had more

education, more talk about the outside world, and they traveled. While my father was more business.

Hughes:

How have these two ways of leading one's life developed in you?

Alafi:

I knew very early that I wasn't going to live in that country. I knew very early the whole French history and literature. As a matter of fact, when I first went to Paris, it seemed as if I had been there all my life. When I came to the States, I understood the culture. Coming to the States was really the most impressive thing to me. I thought I'd spend a year or two and then go to Paris. But when I came to the States, I very quickly found that this is a more democratic country—in personal relations and what people can openly talk about without hesitation.

The first day I arrived in Berkeley, I still was looking for my friends who went there six months before. I went across Sproul Plaza, and there was a drugstore—I had just come off the plane. I sat at the counter, and I saw the menu, I really didn't know what this food was.

Hughes:

You were coming straight--

Alafi:

From New York. I had already stayed with my cousin in New York who had left Baghdad when I was four years old. So I came and saw him. Then I came to Berkeley, and I didn't know what to order. This guy was eating something, and the girl said, "Do you want to eat one of those?" He was eating a hamburger. And then she brought it, and I started eating it, the same way as he did it. I noticed every time I'd take a bite, he'd look at me. I'd take another bite, and he'd look at me. Then he said, "You must be hungry?" I said, "Yes." He said, "But you are eating the plate." The hamburger was bigger than the paper plate. [laughter] I saw the people here; they are open; they tell you everything there is to know. Because if you ask anybody in Europe any question, even today, they won't open up. They are afraid.

Hughes:

Why is that?

Alafi:

I really believe it's fear of anything they might say; they might incriminate themselves or say the wrong thing. I sit on the plane between here and Los Angeles, fifty minutes—yes? This woman's talking to this woman across the aisle. By the time the plane lands, she's told her about her divorce, her children, her grandchildren. It's unbelievable! You would never hear this in Europe or Japan or the Middle East or anywhere. That is the major, major difference in the culture, and therefore, you can be yourself here.

Hughes:

And you saw that right away?

Alafi:

Quickly.

Hughes:

How old were you?

Alafi:

I was eighteen, seventeen.

Hughes:

Oh, very young.

Alafi:

In Iraq, we were taught all the time that the only thing you could take with you, because you'd been persecuted all your life, is whatever you have in your head. So education was extremely important.

Hughes:

Well, let me ask you a question about education. Were you developing interests in school?

Alafi:

I wasn't sure; I thought in the beginning to study mechanical engineering. My first course was surveying. I brought with me a suit tailored by the king's tailor. He used to be our tailor too. It was a double-breasted, pinstriped blue suit. Even my wife remembers it. She hated it. She's from Berkeley. I wore it with a white shirt, and in the surveying course they took us up the hill behind the law school to take measurements. Everybody was looking at me and saying, "Where are you going in this suit?" I said, "Nowhere." All of them were wearing jeans. My father was in textiles. I looked at the material; I said, this is very, very thick—it will last me four years of college—yes?

So the next day, I said, "Where do I get blue jeans?" Across from Sproul Hall, there were shops. At that time they all came to here [points below the navel], and I am accustomed to tailored clothes. I said, "I want something to come higher, to the waist." So he had to give me bigger and bigger jeans, and I had to fold them. I wore them the next day, then I never wore them again. I went to my friends, and I said, "We really should get tailors and have them tailor these blue jeans." That was '47, '48. And I even thought, seriously, Why not make a whole design that fits? Twenty years later they started designer jeans that fit you.

Anyway, so that's when I start taking courses, and I really didn't have a feel for it. I was getting D's, flunking in engineering courses.

Hughes:

Was it a language problem?

Alafi:

No, I knew English. We had to take an English matriculation exam in Baghdad after the French and pass it. I could have gone to London University with that.

Hughes:

Why had you chosen the University of California?

Alafi:

I and my friends applied to a lot of schools. Of course we had heard of MIT, because I had a relative there, and the University of Chicago, because of Chicago and Al Capone. When I came to New York, my cousin said, "Where are you going?" I said, "To Boston." He said, "Are you crazy? The snow is up to here in the winter." I said, "Okay, where shall I go?" He really wanted me to stay in New York. He had a daughter; he wanted me to marry her. I said, "No, I'll go to California." UCLA was not as good as Berkeley academically then. So I came to Berkeley. I really was going to spend one year and then go to Paris, because I had friends who went to Paris. But in the late forties they said, "Don't come; it's a disaster!"

Hughes:

Because of the war?

Alafi:

'47, yes.

Hughes:

The aftermath of the war.

Alafi:

And then, the more I stayed, the more I saw: this is really the land of milk and honey. Its people are decent. I didn't like the French anyway.

Before coming to the States, one summer I said, "I'm going to Lebanon by myself," and that's the first time I left by myself. I was thirteen, fourteen.

Hughes:

That's pretty young.

Alafi:

I arrived in Damascus, and I stood in the center. I went to the hotel and felt all of a sudden so lonely, I couldn't stand it. I checked when did the bus go back, they said, "Not until Thursday." So, I said, "It's embarrassing; I told my friends I have gone; even if I die, I'm not going back!" So, I stayed one night in Damascus, then went to Beirut, which I knew. I knew Lebanon because my family was there before. I met people in their twenties, thirties, from Iraq. We started going to dinner and all of that, and I stayed the whole summer there by myself.

So when I came to Berkeley, it was a new world really—everything to do was different. That was exciting. It was opening my eyes every day to everything different: the way people think, and also the way all types of people interact. In Berkeley, slowly I had friends who were physicians, and dentists, and professors, and they didn't care if I was an undergraduate or not. They take you to their homes and cook and all of that. This is not done in Europe. There was a feeling of respect here for who you are.

I noticed another thing. You get dressed in Europe, and you go to a fancy restaurant. The carpenter can't afford it; he doesn't go. I noticed in Berkeley the physicians, the professors, the workers, and the students are eating together, and that they can go anywhere they want to. That is

so important. You don't feel it, because you live in it. This is a fact: not England, not France, not any other country has this.

[Begin tape 2]

Alafi:

Looking back, I think it gave me the idea that I was not going to do something because my parents wanted me to, or my cousins, or my neighbors, or whoever is there. I really wasn't sure what I was going to do, and it didn't matter—yes?

Hughes:

Did you feel any pressure from your own father?

Alafi:

No, never.

Hughes:

He wanted you to do whatever you wanted?

Alafi:

Yes. I still remember when I went to visit him in the seventies. I already had started a number of companies, and I was telling him, "I started this company, and that company and—" He kept looking at me, and he said, "Moshe, just remember you need only this much to eat and sleep, so don't kill yourself." I said, "I am not killing myself; it's a game. I am telling you so that you understand." So no, I didn't feel any pressure. We lived very comfortably, beautifully, back home. But I always knew that you could do more if you were more successful. You could travel more, if you had a little bit more money. I knew I liked to travel all over the world, so how do I do it? Become a pilot? [laughter]

It was important to do something exciting at the same time, and I knew right from the beginning that I would not do anything that's not exciting. I was doing research at the university even as a graduate student, and I enjoyed it, working until four in the morning in the lab, just to see the results.

Hughes:

Yes, but don't go so fast, because we've left you surveying behind Boalt Hall. [laughs] And you didn't like it.

Alafi:

So I started taking courses after that and trying to think, Do I really want to go to medical school? And I started taking courses, not making a commitment towards that. I was taking chemistry, physiology—radiation physiology at Donner Lab.

Hughes:

Crocker Radiation Lab was probably still around, right?

Alafi:

Yes. What is his name who died from radiation exposure?

Hughes:

Joseph Hamilton.

Alafi:

Yes. When he died, they found uranium in his lab.

Hughes:

Was it uranium?

Alafi:

Whatever.

Hughes:

Radium, I think.

Alafi:

So I took courses there, and I honestly enjoyed doing research. I did high altitude research and went to White Mountain.

Hughes:

As an undergraduate?

Alafi:

After I graduated.

Hughes:

Why did you go into biophysics?

Alafi:

It was physiology and biophysics—yes.

Hughes:

Why did you choose those subjects?

Alafi:

First I thought, Maybe I want to go to medical school. But honestly, inside me I wasn't sure. I saw a lot of friends already practicing. Is this how I want to live? So my soul really was not in it. That's why some courses I just didn't do well in. I wasn't willing to sit day and night memorizing different things. Then I started doing research in physiology. But in between I started having children. My wife started her own elementary school. Really was a very fantastic school, two hundred kids. They teach them languages, mathematics, French, you know. And our kids went there. She was very successful. Also my parents were sending money.

Hughes:

You weren't making much, were you?

Alafi:

I started hosiery stores here, just like my cousin. I started a chain of about five, six. I was making more money than anybody while I was in graduate school. I even started one in Los Angeles.

Hughes:

Which was a branch?

Alafi:

No, it was simply my own, but my cousin helped me in the beginning. I really was thinking, Shall I open fifty or a hundred of them? Then slowly I felt, living in Berkeley, that's not what I was going to do. It felt like prostitution, sort of. My father was in that business, and I said I'd never be in that business.

Hughes:

Why did you feel that way?

Alafi:

Because the world has more exciting things to do.

Hughes:

It was the excitement; it seems to be a theme. [laughs]

When had you met your wife and married?

Alafi:

I'd met her in Berkeley. Quickly, people invited me to parties in Berkeley.

Hughes:

Soon after you arrived?

Alafi:

Almost. Somehow it was just the right group, the bohemians of Berkeley. We knew [Lawrence] Ferlinghetti. We knew all his friends. We used to go Ferlinghetti's cabin in Big Sur.

Hughes:

How did you get connected with that group?

Alafi:

Well, at first we lived on Panoramic. A world-famous professor was there, where I met for the first time [Francis] Crick and what's his name?

Hughes:

James Watson?

Alafi:

Yes, Watson, he came to Panoramic in the fifties.

Hughes:

After the double helix?

Alafi:

No, before! He wasn't known then.

Hughes:

So he was a really young guy? Because he was twenty-three, I think, when he and Crick discovered the double helix.

Alafi:

He had all the professors there. [Roger] Stanier I remember was there. It was Stanier's home. And a lot of scientists from the East Coast and Denmark. All the Europeans were saying how America is not educated, the culture is more in Europe. Watson told this Danish woman, "What the hell do you have in Denmark, Hans Christian Andersen?" We used to go in later years to Cold Spring Harbor for Friday, Saturday, Sunday. Chris, my son, would go there—see, Chris and Watson are good friends, and so I reminded Watson of that night in Berkeley in the fifties.

So anyway, we were living on Panoramic and starting to have different friends through the university. And then there were people on Panoramic who lived with [pause], the guy who wrote the *Tropic of Cancer*, *Tropic of Capricorn* [Henry Miller]. One of our friends lived with him in Big Sur. He told me they would drink by noon, each one of them, half of a jug of wine. So that guy died of cirrhosis of the liver.

Then we had other friends on Panoramic who were very good friends of Ferlinghetti. So we became friends of all of them, and then we would go and stay in Ferlinghetti's cabin, where all these people wrote the books in the sixties.

Hughes:

On the Road, and all those.

Alafi:

All of them.

Hughes:

Say something about your wife, please.

Alafi:

I think I saw her at a party. Yes, I did. I was living in a house with some Iraqis, and I invited an American guy, and this guy came with her. I was thinking, How come he could have this girlfriend? Why not me?

Hughes:

[laughs] She was beautiful?

Alafi:

Yes [with emphasis]. She attracted a lot of people in Berkeley. So one day I said to her, "Why don't you come by yourself to dinner?" She said, "Okay." That started the whole thing.

Hughes:

Is she Iraqi?

Alafi:

No, she's American. She was in the psychology department at Berkeley, and she finished as a psychologist. She's from Kansas. She left when she got her degree at University of Chicago. Then she came to Berkeley.

Hughes:

You got married very quickly?

Alafi:

Not right away. We lived together for about a year.

Hughes:

How old were you by then?

Alafi:

[pause] Probably twenties, yes. I don't know if people know who they are or what they are doing when they get married.

Hughes:

Well, in your case it seems to have worked. [laughs].

Alafi:

Yes, but 50 percent of marriages don't work.

Hughes:

Yes.

Alafi:

It is very different to get married to an American woman. That has its own attraction, too.

Hughes:

And difficulties, I imagine, as well.

Alafi:

Yes. I think she was more tolerant.

Hughes:

How were you used to treating women?

Alafi:

Women are equal, I always thought. As a matter of fact, I thought most of the time they are more than equal.

Hughes:

On what basis? Intelligence?

Alafi:

Yes. I have a number of women CEOs. Some of the time, not CEOs, they can do better than CEOs in their commitment.

Hughes:

How did you get that way, considering the culture you came from?

Alafi:

The first thing was, I was educated in a French school—maybe that. Myself, my sister, my brother grew up thinking, We are no better than anybody else, but we are not lower than anybody else. Even today. We have maids who move around us—I want to go myself and get the glass of water.

Hughes:

You don't like hierarchy?

Alafi:

I see so many men that are in high positions, they shouldn't be there. Women can take more crap, and yet they can do the jobs better. That means they're, in my mind, at a higher level than the idiots.

Hughes:

Well, it seems to me that you were living in several worlds as a young person. And maybe when you do that, you have the advantage of not having to adopt the viewpoint that's handed down to you.

Alafi:

Yes, but I also had to adapt and survive. And to adapt, you see how your environment works.

Interview 2: April 21, 2003

[Begin tape 3]

Hughes:

Mr. Alafi, last time I don't think we said much about the high-altitude research you did.

Alafi:

I was in physiology and radiation physics. I took courses with [John] Gofman and all of those people. And the research we were doing was on high altitude effects, especially on blood production and destruction. The physiology department had labs at White Mountain. They had a lab at ten thousand, twelve thousand, and fourteen thousand feet. But we were also doing research on mice on campus because we could create a vacuum in a chamber and simulate the high altitude and then see what happened to the blood production at high altitude. What happened in the pregnancies? Did they abort at a certain point? All of that. So, I did that, and for some of the work I had to go to White Mountain, put the mice there and compare the results to those of the lab. That was fun. It was exciting to be awake at four o'clock in the morning and see results. While I was in graduate school, I had a chain of hosiery stores, and I was making money. But I felt, maybe because I was living in Berkeley, and my wife had a primary school to the seventh grade. For Berkeley, it was funny to be selling hosiery, you know?

Hughes:

Was she uncomfortable with your doing that?

Alafi:

No, she knew ultimately I was going to do something else. At that time she opened her school, Twin Pines, for two hundred kids. She made it into something big, and it was good. Our kids went there. Subsequently, she started a graduate school, Center for Psychological Studies, for people who wanted to get their Ph.D.s in clinical psychology. That lasted for at least twenty years. It was on Solano Avenue, Albany. Then I decided to finish my work at the university. I did the master's and the work towards the Ph.D., then I stopped. I felt really two things: I really wasn't shaking the world in research. It was fun for me, but I also felt it was selfish, plus I really started feeling encapsulated. I looked all around me, and I didn't want to be like the academics.

Hughes:

Why did you feel it was selfish?

Alafi:

Because it was not making enough of a living to support my children. I also thought, I knew my parents had money, so I knew there was a big world; I wanted travel; I wanted to do a lot of things. And I didn't want to be like anybody in Berkeley [at the university]. There was nothing wrong with them; they were great, but I wanted to be part of the outside world, rather than going to the lab every day and doing research.

So I decided to do something, and the way I thought of doing something is, I knew a little bit about science, and I felt I could do something in the industry, and yet I did not want to work for any company. I think it comes back maybe from my parents. I remember my father once said to

me, “If you are good, why the hell do you want to work for anybody?” That’s a dangerous statement, because you might not be good. [laughs]

Anyway, I really was convinced I could start a company, and then I thought, What is the company? Physics International has to be about ’61, ’62. I thought of applying radiation to medicine. And the reason: I was taking courses in the field.

Hughes:
Donner?

Alafi:
Donner Lab, yes. Some of the courses with Gofman and others. I thought, I have these friends, two of them were working under [Edward] Teller at [Lawrence] Livermore [Laboratories]—yes? And they were really the designers, the designers, of the bombs. They were designing them, testing them in Nevada, and testing them in the Pacific. And they would go whenever they had tests, you know? So I went to them and said, “Why don’t you get out? And we’ll use your capability to apply it to medicine.”

Hughes:
Did they have any feeling that working on the bomb wasn’t the best use of their abilities?

Alafi:
That’s a good point. At that time, the Russians had started Sputnik or whatever. They felt they were doing something for national defense, and that the country really needed powerful defense. When you work there [at Livermore], that’s what you are creating. You can’t say—like Oppenheimer felt bad later, yes? They were doing something for the country, and the country has enemies.

Hughes:
Do you remember the names of these people?

Alafi:
Of course. It was Wally Birnbaum and Chuck Godfrey and Frank Ford.

So we started having meetings on weekends. And they started making lists, and the lists were so long and so funny. Physicists did not know about biology, and biologists didn’t know any physics, so there was no meeting of the minds. We were trying to make a list of what I knew maybe should be done, and what they think they could do. So it was a mismatch in a sense. But we made lists.

Hughes:
And the lists were projects?

Alafi:
Yes. Then I thought, Now I have to go and raise money. But how to raise the money, that was funny. At that time, ’62, there wasn’t anything called venture capital. This thing [a chronological wall chart of the formation of venture capital firms] was developed by [Franklin] Pitch Johnson.

It wasn't called venture capital; it was called making a living. This is a very important chart, up to 1983.

There is Ed Carter and Edward Heller and Ed Pauley. All of those are regents of the university. I knew the son [Bill] of Ed Carter. Ed Carter was a dyed-in-the-wool Republican—chairman of Broadway Stores, Neiman-Marcus. When Nixon was running, Carter had each table for dinner for ten thousand dollars each. But the son was a Berkeley guy. He used to play his clarinet with Turk Murphy. He's a photographer. He had a party in the Berkeley hills, and he brought the New Orleans folk jazz group. I forgot the name, the most famous one. My wife said, "Why don't you go; his father's coming. Ask him about how to start a company." They had students, and they were sitting on the floor, smoking marijuana, some of them. I said, "I don't want to ask him. Carter doesn't know anything about science."

So I went there, it was hot, and he was standing there shocked: "Who are these people?" You know the Berkeley types. I went and I told him the story. I said, "I have three guys; you could check on them. They are from Livermore; they work under Teller. I would like to start a company with them, and apply radiation to medicine." He said, "We're going to have a regents' meeting in an hour. I'll take you and have you meet Ed Heller, who is also a regent, and tell him the story."

So he took me in his limousine. I left my jacket, my wife was there, the car was up in the hills. The regents' meeting was on Oxford. [Clark] Kerr was the president then. Ed Heller was in the room already, and he closed the door. I said, "This is my story: I am a Jew from Baghdad"—he's Jewish; I didn't know until later—"I am trying to start a company. I have these people; I know we could do something new and different." I had a list on the back of an envelope. "These are the different projects we're going to work on." He said, "I don't understand it. How much is it going to be?" I had another envelope. I said, "We are going to get six desks. I can get them in Berkeley for twelve dollars each. And twelve chairs, a dollar each. I know where to get them." My wife had a school, so I knew where to get these things. And he said, "How much do the scientists make?" I said, "I think they are getting twenty-five thousand." He said, "How much do you want?" I was a graduate student; I said, "Five hundred." He said, "Can you live on that?" "I will live like a king." "So how much do you want for the whole project?" I said, "For two years, a hundred and fifty thousand would be enough." He said, "No." And I said [to myself], "The son of a bitch is bargaining!"

Hughes:
[laughs]

Alafi:
They told me on the boat, "Don't bargain with Americans. When you go and buy, that's it." I said, "What do you mean, 'No'?" He said, "You need half a million." I said, "You've got a deal!" [laughter]. Ed Carter was standing there. He said, "I want part of it, too." Then I had to go out because the regents were waiting. I looked in my pocket; I had only one nickel, and it was a dime to call. So I went to the gasoline station on the corner of Durant and Fulton. I used to get gas from that guy. I still remember his name was Jim. I said, "Jim, I swear to God, somebody's going to give me half a million dollars. I want to make a phone call. I have one nickel; I need another nickel to call my wife. He said, "Are you crazy?" [laughs] So I called her and said,

“Okay, come and get me.” She said, “What did Heller say?” I said, “They want to give me half a million!” She said, “Just take it!” [laughter] Then we started Physics International.

Hughes:

What did they think you were going to do? What did you think you were going to do?

Alafi:

I was going to start a company for the application of radiation physics, for example. You get isotopes; you build instruments--

Hughes:

You weren't talking about cancer therapy?

Alafi:

They said to me they could produce electron beams that could really cure cancer. Maybe we could have competed with Varian. What's his name, the guy at Stanford who was related to cancer radiation? [Dr. Henry Kaplan] He used to come and bring cells and expose them to our radiation sources. We started building x-ray tubes that could deliver ten million electron volts, to simulate the radiation coming from the nuclear bomb. So we spoke about these kinds of things. But we didn't have specific instruments. I said to Carter and Heller, “We will create something out of this company,” and they had faith. I remember I was driving Carter to the airport a few months later, and I said, “Mr. Carter, now I have your money, I am really worried, because it's your money.” He said, “Don't worry. First of all, we can write it off. Also we have faith in you.” I said, “I am starting from scratch.” He said, “In a few months, you knew much more than we do.” So they really were making a bet.

Hughes:

Why did they have such faith in you, a graduate student?

Alafi:

I think Ed Carter's son had told him something positive about me. It was the beginning of a new technology then. Heller made a lot of money in some company related to science. And I think how I talked convinced them, with a combination of my faith plus those scientists, it was worth a bet. Today, you can't do it. You have to write a business plan and do due diligence. As a matter of fact, a lot of the companies that I started presented one or two pages. I couldn't do it today.

Physics International was the beginning. The physicists [Wallace Birnbaum, Charles Godfrey, and Frank Ford] didn't know biology. We got consultants but it didn't work. So it became a physics and engineering company because that's all they knew how to do.

Hughes:

Well, I'm not so sure that anybody knew too much about the biological effects of radiation at that time.

Alafi:

Yes, Gofman started saying, “It's bad.” What got him in trouble with the whole university was saying that any level of radiation was bad. And Teller started saying, “Some little radiation is helpful.”

Hughes:

They were diametrically opposed viewpoints. Well, Gofman's still saying that, you know?

Alafi:

Is he alive, still?

Hughes:

Last I heard. I did an interview with him probably in 1980, and I still get the newsletters that he sends out about no safe threshold of radiation.

Alafi:

We were thinking maybe of building diagnostics as well. They were building diagnostics for the bombs, to see at what level you'd get radiation injury. I knew then, they were putting soldiers at the zero-point to decide how much radiation they could tolerate. And they knew it! But Teller said at that time, "It doesn't harm anything." Then when we started building, the big thing was x-ray tubes. The military started bringing the guts, electronics, of the Minuteman to test them. If it's exposed to radiation, will it fail? And therefore how to protect it from radiation. So we started testing the Minuteman. The military had a top-secret facility here in Berkeley. They would bring it, we'd expose it, and then they'd change it.

While we were doing that, we tried a little bit to develop a coherent radiation—whether it could be helpful to some cancers. But it was crude in the beginning.

Hughes:

Coherent means the same wavelength?

Alafi:

You really make it sharp and go to one point.

Hughes:

You can focus?

Alafi:

Yes. Physics International became bigger and bigger, and I started feeling that's really not what I wanted to do; you know, it's physics and engineering. I was executive vice president. I was effectively running it—yes? And I'd never run a company in my life, except I grew up in the streets of Baghdad. That's really what it was.

Hughes:

Who was president?

Alafi:

Wally Birnbaum. My friend who was a scientist.

Hughes:

Did he know anything about running a company?

Alafi:
Zero.

I'll tell you a story. I have a friend, Donny Strasbourg, from the Pasteur [Institute]. He has a company now in Paris. Donny was a child of the Holocaust. He was born in Switzerland and went to Belgium, but now he lives in France. His wife also has an M.D., Ph.D., and she used to be in business development for the French company called Rhone Poulenc, I think. And one day, the president caught her in the corridor and said, "Elianne, which business school did you go to? The one in Paris, Oxford, or Harvard?" She said, "You want to know the name of the school? The streets of Antwerp." Her parents were in the diamond business, and that's where she learned business. And that's also what I believe today. I think you could send people to the best Harvard school. They get bigger jobs, but I don't think they all necessarily have a feel for what business is.

I hired once, in Physics International, the first CFO. I remember we were developing proposals to send to Washington for contracts. We really were just in the beginning. We had five scientists. We were trying to project the indirect overhead—how much paper you need, things that you don't know yet. You negotiate a rate, let's say 100 percent. So if you spend a dollar on direct labor, you are allowed your 100 percent overhead. At the end of the year, they come and see if you really spent only ninety cents, so your overhead is ninety. And if you've spent hundred—they put a top to it. Hundred and ten, they give you ten more. So, that's always an estimate. Within 20 percent, sometimes—yes? And then the G&A [general and administrative] also. It's an estimate. And especially with a new company, you really don't know.

So I hired this guy from Harvard. I was so impressed with him because of Harvard. I didn't go to business school. Wow, I thought, somebody from Harvard working for me. And we were preparing this overhead. We defined what the direct cost was. I said, "Could you estimate how much the overhead and G&A would be?" For a week, he didn't finish.

[Begin tape 3, side B]

I came at midnight. He said, "I calculated the overhead." I said, "What is it?" He said, "97.035 percent. And G&A, 21.632." I said, "You are fired." He said, "Why?" I said, "Idiot, it's an estimate, it could be within 30 percent! You spent a whole week?" [laughing]

Hughes:
Have you ever had any formal business training?

Alafi:
None.

Hughes:
[laughing] You are not a very good advertisement for the business schools of the world.

Alafi:
As a matter of fact, a lot of them are bullshit.

I'll tell you another story. A big venture group in Boston opened an office in Palo Alto. Then they said to me, "When you want to invest in a company, please show it to us in Palo Alto." So, I brought this new guy to them, and I said, "Could you evaluate what he's saying technically?" The guy at the venture capital firm started asking me, "Tell me about your background, how many children you have." I said, "Idiot! It's not me; it's him. What does that investment opportunity have to do with me?" The venture capitalist was doing due diligence. He was right if I came from Timbuktu. [laughter]

Anyway, we started Physics International and started getting contracts from the government. They knew the inside of the Department of Defense, and they knew what they needed. So they knew what they could develop. So it was successful in that sense.

Hughes:

Is that what you were expecting?

Alafi:

No, it was to apply radiation to medicine. I left because that's not what I wanted. It went public, and I made money out of it, and I said that's really not what I want.

Hughes:

Now, did you bring it public?

Alafi:

Yes.

Hughes:

That was your first experience, right?

Alafi:

Yes.

Hughes:

How did you learn how to do an IPO?

Alafi:

We had attorneys from Montgomery Street, and they tell you how to do it. And you say, "Maybe not, maybe yes." I'm trying to remember: did Physics International go public when I still was there, or when I had just left? Anyway, it raised a lot of money.

Then I started thinking, What do I do next? Oh, while I was at Physics International, we started a small SBIC [Small Business Investment Company]. From that SBIC, I started one company called Chromatronics, which was building liquid chromatography, with sixty thousand dollars. I had to do it in partnership with the investors and founders of Physics International because I was still there. It became ultimately successful, but small. Dick Gundelfinger was from Berkeley, all the technicians were hippies who worked there, and they were fine. But he didn't want the company to grow too big. He designed the first [amino acid] sequencer, a big one, and the technology came I think from Australia. And we even showed it in one of these technical shows. But the guy said, "I'm not interested in selling half a million dollars-worth of goods." He was a

small grocery store type. We sold the company to a company on the Peninsula and made a lot of profit. Spectra Physics.

Hughes:

But nothing happened to the sequencer?

Alafi:

No, we dropped it.

I left Physics International after starting at least two or three companies from that SBIC. And then I was trying to start other companies. Then I made a partnership with Carter, and I don't know who else. And from that partnership, we started Andros and I can't remember the others. Andros split into Andros and the next one is Novacor. Novacor developed an efficient left ventricle assist device, and it is in about a thousand people.

Hughes:

What years were you associated with Novacor?

Alafi:

In the sixties, up to '78, because then I left and started Biogen--it's in that range. And Novacor is still in Oakland. It was sold and resold: the FDA took a long time to approve the device. The device is in nine hundred thousand people in England, and I think now a Canadian company owns it, and they are pursuing it. We developed it here with Stanford. It was in cows, stayed in two hundred days, and then was started in people. It never made the big headlines because when we sold it to one American company, they moved it to Europe. They had more support of the government to put it in people.

Hughes:

Was it meant to be a permanent implant?

Alafi:

It started as being temporary. But what happened, you have to wait until you have a replacement, so it started staying there longer, especially when they can't find a compatible human heart. Slowly they found it could stay three months, and then it was a year, then a year and a half, and so forth. And then they started to make it completely implantable. It is a pump. Usually it's the left ventricle that's sick, so the pump bypasses it.

Hughes:

You probably were working with a cardiac surgeon at Stanford.

Alafi:

What's his name? [Dr. Shumway] So, that was the other company. Andros split. They were in gas chromatography, infrared, and they developed monitors that monitor CO₂ and NO₂ emissions in your car. That company came also from that partnership that I formed subsequently. So I could talk about a number of those companies.

Hughes:

Well, I think in the interest of time, we shouldn't go into great detail on each one of these. Before we discuss Cetus, talk a little about the history of venture capital. You were a pioneer in a field that was uniquely American for quite some time, right?

Alafi:

Yes.

Hughes:

Who else was around and where were they located?

Alafi:

There was one guy called [Franklin] "Pitch" Johnson. He started with Bill Draper. I don't think the field was called venture capital then. And, as a matter of fact, we talked, and maybe we wanted to co-invest together.

Hughes:

Where were they located?

Alafi:

In Palo Alto.

Hughes:

In context with Stanford University?

Alafi:

Yes. I was the contact here. Nobody at Stanford would come to Berkeley. There they were miniaturizing everything, and here they built the cyclotron. They built a big thing. Also, Silicon Valley had a history—HP [Hewlett-Packard] and Varian started there. Berkeley, that's not their thing. I'm talking about myself, but probably others felt the same thing. I started thinking you could develop instruments or drugs, even. I realized early that those pharmaceutical companies and the companies that are doing diagnostic things were coming, a lot of them, from universities. And what do these companies do? They go to universities and hire a professor on their board or something. And if they have ideas, they develop them. It's really a new phenomenon when we venture capitalists said, "Why can't we hire those professors or give them consulting jobs, and we develop the drug, and we sell it to the pharmaceutical company?" It was really saying, "The giants can't be all that powerful. You can beat them." And that's the idea. Or you could compete with them, because what the hell do they have except they're a giant?

Hughes:

And you could sell that idea?

Alafi:

Yes. And I think it comes, too, with the idea that Americans are gamblers, and Europeans are not.

Hughes:

Why the difference in culture?

Alafi:

I am not a psychologist; I am not a sociologist; I don't know why. But I'll discuss Europe and that might give you an idea. If I would have gone to Europe and tried to start something the way I did here, I wouldn't be able to enter the door of a company. Even today, if you are not somebody, they won't even talk to you. You see what the Americans do: they invite software experts from Delhi and have them work here. The Germans still today are fighting about whether they should bring in Indians and give them visas like the Americans? They are afraid they might stay. They were able to import Turks and Albanians and North Africans to work in the factories. But to get people--

Hughes:

Well-educated people.

Alafi:

--to start a company, it's inconceivable.

I'll give you an example. In Europe, in the eighties, I was introduced to somebody in Hamburg who was the managing director of Eppendorf. I was referred by somebody from the board of HP, and at that time I had a partnership with Monsanto. I called him and said, "I am a partner of Monsanto." So he invited me to his office to have lunch. I said, "Listen, you look at me, I'll tell you who I represent." Then I told him, "I'm a partner with Monsanto, with the board of Monsanto. I can spend money and start companies in the U.S. and in Europe. So when I tell you I can do it, all you have to do is pick up the phone and check." I was so impressed with him. I said to him, "Why don't you leave, and you start any company you want. I'll have Monsanto behind you." He laughed and said, "Why don't we finish the food and have a drink, and then I'll tell you—yes? Now that we know each other a little bit, I'll tell you why. One, if I go home tonight and tell my wife, 'Honey, we are going to give up the Mercedes and the chauffeur and all of these things. I am to go out and start a company by myself with two more people,' I think she would either call the mental hospital or divorce me. Two, if I started and failed, that's my end. Three, if I go to the bank and want to borrow money, the question is, what's your collateral?"

You come to America in the eighties, they were jumping over each other to start one or the other company. The other thing is, when we started Biogen and it was time to go public, we had a big meeting in Geneva—we used to have board meetings all over the world. The European scientists who were dominant on the board said, "No." And why? They did not want to have their names on the prospectus, that they were making money. They delayed it at least a year, and we almost missed going public. Money was dirty although they would kill for it.

I'll give you another example. Oxford Glycosystem is in the news now. The vice president of Monsanto said to me, "Go and see Dean So-and-So at Oxford." At that time, Chris was going to graduate school there. I saw somebody like a dean, maybe related to business. And I sat, and he's wearing this tweed jacket with leather here--old British thing. And I started telling him about Monsanto, I was telling him about myself, I was telling him about Cetus and how much money these companies make. The minute I said that, his eyes changed. He looked at me and said, "Mr. Alafi, we at Oxford are not after money." I said, "I am sorry." Later, when Oxford Glycosystem was going public, Oxford was fighting for every share that they could own and more.

Hughes:

You didn't get that response in the United States?

Alafi:

No.

Hughes:

There were some people in academia who felt that way.

Alafi:

You are right—a lot of them. Palo Alto [Stanford University] really started it. But I did not have the problem of entering any investment bank and saying, "That's what we need," especially once you had one success. When I went to Europe, you know, if I went the way I dressed, just like a student, I don't think they wanted to give me any money. In a restaurant even, I remember Maxim. Carter's son got married in Paris. I was in the ceremony. Then they had a dinner at Maxim in Paris. I got there about ten minutes late. The doorman said, "What do you want?" I say, "I'm eating here." And he looked me up and down. I said, "Are you looking at my zipper? What are you looking at?" He said, "Do you have a reservation, sir?" I said, "Go down, you'll see a big table; I am paying for it." He looked and came back, then he knelt to the floor. It's not that bad here.

Chris says to me now, "You would be amazed." My name is known in Europe, because we started Qiagen, which is a major success in Europe, one of the first venture companies in biotech. The bubble burst in Europe—yes? The Europeans didn't know what a stock option was. And then they started buying stocks and the bubble burst. Now they won't touch stocks. They give it away, which is why Germany is in a disaster mode. They bet once, and they lost. And Americans, you start a company; even if you lose, you are better the next time, or you get divorced. It's better the second time. It's constant change. Yes, that is the difference.

Hughes:

But isn't there also a difference between the East Coast and West Coast? Isn't there a different mindset in Silicon Valley than almost anywhere else, particularly in terms of risk tolerance?

Alafi:

Yes, you're right, and I don't know why, yet. I know some of the investors out on the East Coast are just as daring, and they started so many more companies. But in general, it's a correct statement. I don't know where we went in our discussion.

Hughes:

Well, I was asking you about the venture capital climate when you were beginning to found these companies.

Alafi:

It was not called venture capital; it was called just making a living.

[Begin tape 4]

Pitch Johnson and Bill Draper used to run to existing small companies all over Palo Alto and knock on the doors of all of them and say, “We have money. Can we give you money? Tell us what you have.” And that’s how it started.

Hughes:

[laughs] I believe you.

Alafi:

Can you believe now, doing it that way? They won’t even answer the phone today.

Hughes:

So what do you think about doing venture capital in a much more formal way nowadays?

Alafi:

People will start companies from now until doomsday. They have a formula—and probably it’s correct—you really have to have the best scientists or the best science. It’s a breakthrough. It’s not a “me too.” I am talking about management. Ideally, you have somebody who’s tried before and succeeded. If this is your first company, they invest but with less evaluation or with more trepidation. It has become big, hundreds of millions. They have to really go into due diligence, legally and all of these things. Some of them have ten partners and they have to all agree. Or at least a majority of them agree.

With the way we do it today, we decide just on two things—management and technology. I just started a company in St. Louis with two Muslims from Bosnia. I told them I was Jewish. I really was impressed with them. I trusted them. And we started a company. Now people are trying to put ten million in them. They are already profitable after one year, and it’s because they have ideas that everybody says will work, even people from Mallinkrodt. Besides their other products, the idea is to do noninvasively, actually measure blood gases and also different analytes—glucose, et cetera, without doing any puncture. Anyway, I didn’t have any evaluation or anything, I just sat with them and started it. Very few people will do it that way.

Hughes:

Is that your pattern still? The way you do everything?

Alafi:

Yes.

Hughes:

And is it just you and Chris?

Alafi:

Yes. And now we have Karen Hanly. She worked in an investment bank. I really don’t know the science any more.

Hughes:

What do you look for when you’re trying to invest?

Alafi:

The technology—is it real? Can they really do it, at least the first phases? And do I trust them?

Hughes:

But how can you know whether they can do it?

Alafi:

Oh, you mean whether the technology works? Oh, that I would check.

Hughes:

And how do you check?

Alafi:

I check with people who are authorities in that field. But I don't have to go to committees and do reports.

Hughes:

You just get on the telephone?

Alafi:

Or see them. It depends what it is. I'll tell you how we started Cetus. I knew Don Glaser for a long time. He had his kids coming to our house to swim in our pool. We knew him and his wife very well. One day he came to me and he said, "Moshe, I have this technology--"

Hughes:

The microbial screening.

Alafi:

Yes. "—and I think we could apply it to finding a needle in a haystack." And then he introduced me to people who came to him, [Ronald] Cape and [Peter] Farley. "See them, and then we can start a company, okay?" I saw them. They could sell the Brooklyn Bridge; they seemed really competent and confident. But I wouldn't put a penny in them today.

Hughes:

Why?

Alafi:

I have to be careful. I'll give you an example why. Biogen had a major breakthrough in cloning and expressing alpha-interferon. Meanwhile, Don Glaser's technology at Cetus wasn't working then, while they had a major contract with Schering-Plough, who put seven to eight million dollars, ten million, in it. And the technology wasn't working.

Hughes:

In what way wasn't it working?

Alafi:

We had a contract to give them a better microorganism for producing Gentamycin.

Hughes:

A kind of antibiotic?

Alafi:

Yes, Schering's major one. We had spent about ten million dollars, and our technology—I knew and everybody knew—was not giving them more than 5 or 10 percent improvement.

Hughes:

It was supposed to increase the production of antibiotic?

Alafi:

Yes, to double or triple the yield. Then Don Glaser brought in the chairwoman of statistics at Berkeley to look at the statistical results. She said to him, "You might as well flip a coin and you'd do better in selecting a more productive microorganism." They did not want to tell Schering. And I said, "I'm going to tell them." That's when Don Glaser said, "If you tell them, I'll sue you." And that's when the whole thing ended. I said, "You drop dead. I want to sleep at night." And I told Schering. I called them and said, "I own 13 percent of the company. Cetus' technology doesn't work. Stop the contract."

Hughes:

And everybody was ready to kill you?

Alafi:

Oh, yes. But I could sleep at night. But after that I made all kinds of money. It's not the money. I did it for my own integrity. After that, the chairman of Schering, no matter what I said, they would do. As a matter of fact, they invested in Biogen, and they got interferon.

Hughes:

Did you leave Cetus because of this incident?

Alafi:

Yes, it was a major break.

Hughes:

It was 1978 when you called Schering-Plough, and then you left Cetus.

Alafi:

I don't know if that's the date.

Hughes:

Well, according to your resume, you were at Cetus from 1972 to 1978.

Alafi:

Yes, it was 1978, because then Biogen was started.

Hughes:

Oh, so it wasn't the break over the microbial screening—it was the conflict of interest?

Alafi:

No, no, no. Complete break with the Cetus management and with Don Glaser. And they wanted me out, actually. And they were right. But I couldn't live with it. How do you?

Hughes:

You say they were right because you can't have a company where there is such disagreement at the top?

Alafi:

Of course you can't. And they knew I was going to tell the truth.

As a matter of fact, we sold 8 percent of Cetus to Standard Oil of Indiana. And I was at these negotiations. I told the board, "The technology is the beginning of something great. I wouldn't put money in that management." They said, "Don't worry, we know how to handle the management." I said, "I don't care, I'll sell my shares." You know? But they didn't handle them. The management knew, because they used Glaser, and whatever they say, he says, "Yes." And sometimes it's wrong.

I'll give you an example. When Biogen cloned and expressed interferon, how much interferon did you get? Next to nothing. Subsequently, I saw in *People* magazine a big picture of Glaser, Cape, and Farley with a tube this big, that wide [demonstrates], and saying, "We have interferon, too!" What does this tell Wall Street? That they have it by the tons. That's what we were dealing with. As a matter of fact, Cetus didn't know what to do with PCR. Yes? They didn't know what to do with it. They were losing eighty million dollars a year until what's-his-name got a Nobel Prize.

Hughes:

Oh, Kary Mullis.

Alafi:

I was saying that Americans are gamblers. Actually, when I was still in graduate school, we used to go to the racetrack, and we used to gamble on horses. We would pick five or six out of eight the night before. But when we'd go betting, sometimes we'd change our minds at the track.

Hughes:

Would you win?

Alafi:

We won a lot. As a matter of fact, I think one time Ginger [Alafi] was pregnant. There was a horse running at Santa Anita in L.A. I didn't tell her. I took about three hundred dollars, bought a plane ticket to go and bet, a round-trip plane ticket. So I went there, and I bet on this horse. I still remember his name, Your Host. That three hundred dollars became by the seventh race three thousand, and I had it in my hand. So I bet it all on that horse, Your Host, because even if it walks, it would double the three thousand. The horses were walking to the gate. And then I said I should wait at the cashier, "Why do I have to wait to cash in a walk?" And I start hearing, "Your Host is first." And they go about half a mile, and he falls and breaks his leg. And I hear the whole crowd go, "Oh, wow!" Then I walked out and got a cab. There was a big, fat, old black man sitting in the cab. He looked at me and called me "Brother" or something. He said, "You

look sad.” I said, “I’m not sad; I’m just upset.” He said, “Why?” I gave him the tickets. He gasped. “Three thousand dollars! I would cut my throat.” I said, “No, don’t worry, I won’t cut my throat.” I got to the airport, he said, “I don’t want you to pay me.” I said, “Don’t worry.” So that is when I stopped gambling.

We went to New York one summer, betting. Easterners don’t bet on western jockeys. Willie Shoemaker was there. And I used to go every day and come back in New York with two or three thousand dollars in winnings. Then we came back to Berkeley. There was a horse I used to bet on in New York who was great. I couldn’t go to bet on him because I had a comparative anatomy course or something. I said to my friends, “Please go and bet.” Nobody could go. I was giving them two hundred dollars; I would make maybe three, four hundred. We would hear the results in the evening on the radio. And he comes first, he pays ninety-seven dollars, and he would have gotten me nine thousand, seven hundred. And everybody said, “I’m sorry.” So after these two things I said, “Am I crazy? I’m going to start a company. I’d better bet on people and technology.” So I am just showing you, it’s a gambling game—until today it’s a gamble.

I have started maybe fifty companies, and gambling every day, deciding if I sell the stocks or not sell, based on the stock price. And which ones? You are gambling when you start a company. They look great. Will they make it? Cape and Farley seemed fantastic. It’s an ideal thing, it seemed. They screwed up the company, really. I wouldn’t start anything with them anymore. I think people change too.

Hughes:

So you think that when you first met Cape and Farley that--

Alafi:

They were impressive.

Hughes:

But did you know enough to really judge?

Alafi:

Do I know enough what—people? I thought I knew horses.

Hughes:

Yes, I know [laughs]. Well, one could say that you were swept away by your long friendship with Don Glaser.

Alafi:

With Don Glaser—and he’s a Nobel Prize winner—yes?

Hughes:

But that could be bad, you see. He’s a Nobel Prize winner in physics.

Alafi:

R-r-ight! But he has his device on bacteria to see if you could pick a mutant. And I asked him, “Does this technology work?” He said to me two things, “You start walking when you are little,

and you stumble, then you fall, and ultimately you walk. Sooner or later, the technology should work.”

Hughes:

And that was enough for you?

Alafi:

Today I wouldn't do it—I got older. But still I am impressed with what the scientists say. But I wouldn't bet—it was enough because—There was another thing. We started Cetus, yes? Then we were raising money. I got [Carl] Djerassi, [Joshua] Lederberg, Stan Cohen, and [Alejandro] Zaffaroni. Zaffaroni came and brought a hundred-thousand-dollar check. He said, “No company ends up doing what they think they start doing.” But this was subsequent. That confirmed my first impression. Those guys also were betting. So maybe my bet was correct. But I wouldn't do it today, neither with that management nor with that stake.

Hughes:

If you had Lederberg and Cohen on the Cetus scientific advisory board, you must have moved on beyond just the microbial screening by then—no? Why?

Alafi:

Cape was in Hawaii when Cohen came and said he and [Herbert W.] Boyer had this [recombinant DNA] technology and said you could do it in the kitchen. Because our technology wasn't working, I said, “We should change to that thing.” Cape came from Hawaii, and I still remember, Cape said, “No.” “What do you mean?” I asked. Subsequently they came to their senses—yes?

Hughes:

Why did Cape say “No”?

Alafi:

Because already there was the beginning of a split, and maybe because I said it.

Hughes:

But let me get this clear. Cohen and Boyer and the recombinant DNA--

Alafi:

When was it?

Hughes:

Well, the first papers were published in 1973. But it took until probably 1974 before anybody had the earliest thought of practical application.

Alafi:

I think it became really more of a reality closer to '78 or '77--

Hughes:

Well, Genentech's founded in 1976, and it's founded on the platform of recombinant DNA.

Alafi:

Then we started already in '76. Ask Stan. [Eugene] Kleiner and [Thomas] Perkins were my friends; they were investors in Cetus. I remember when Genentech did the somatostatin. What year was it?

Hughes:

1977.

Alafi:

We were working already, but they were working faster. That's what is the stupidity. Genentech was more efficient. I don't know what the hell they were doing at Cetus; Stan will fill you in.

Hughes:

Well, I know Genentech was extremely focused, whereas Cetus was more spread out. Wasn't it?

Alafi:

Stan wanted to go onto growth hormone. Cape said to him, "How many dwarves are there in the world?" Ask Stan. They were more interested in talking big.

Hughes:

It was too small a market, you're saying.

Alafi:

For growth hormone.

Hughes:

What about insulin? I mean, that was a big market.

Alafi:

I don't know what they thought then. I was out already. [Alafi left the Cetus board in 1978.] Within a year Biogen did interferon, and then Ken Murray did hepatitis vaccine.

Hughes:

As Swanson tells it, he went to Cetus before he was even thinking of founding Genentech.

Alafi:

How did he go to Cetus?

Hughes:

He must have gone because Kleiner and Perkins had already invested in Cetus.

Alafi:

He was going to do what?

Hughes:

He wanted Cetus to take on recombinant DNA, and he would direct it.

Alafi:

That's not true. Genentech built him up: "He started the whole biotech industry."

You ask Stan. Swanson was employed by Kleiner Perkins. Kleiner Perkins wanted to get rid of him. He was the third wheel. Kleiner and Perkins were making all the decisions. Gene [Kleiner] told me. They said they wanted to get rid of him. Swanson wanted to come and work at Cetus. He gave me his resume. And I went to Cape and Farley, and they said, “No.” I don’t know why they said, “No.” I think they smelled blood.

Hughes:

What position did Swanson want?

Alafi:

Anything. He wanted to work with Cetus because he was interested in the new technology.

Hughes:

Recombinant DNA?

Alafi:

Yes, they refused him. Gene Kleiner said to me, “We gave Swanson fifty or eighty thousand dollars because he went to Boyer and said, ‘Look at what Cetus is saying.’” And Boyer said to him, “With fifty or eighty thousand, we could do something with recombinant DNA.” And Gene said, “We wanted to get rid of Swanson.” It was an investment in Genentech. Gene came and apologized to me, saying, “We are invested in Cetus; three or four or five hundred thousand dollars. I swear it’s not me. It’s Tom [Perkins] who did it.” I said, “Gene, you don’t have to apologize. The world is big enough. I would do it too. Don’t worry.” And he said, “So we gave the investment to Swanson.” This is the truth. Kleiner and Perkins made hundreds of millions on the Genentech investment, you know.

I can’t recall what year Gene Kleiner and Tom Perkins came to me. They said, “People are swapping stock, why don’t we swap half our stock in Cetus with Genentech.” I said, “I would do it tomorrow.” I went to Cape and Farley, and they said, “Oh, we are much better than Genentech!” and they refused. Two or three of Genentech’s products were stolen from the University of California. The proof is, they lost a lawsuit. With interferon, I saw it with my own eyes—[David] Goeddel in court saying after he saw the papers or something of [Charles] Weissmann, he copied and did his interferon. That’s two products. I think they stole one more.

Hughes:

Well, that suit with UC was about insulin and growth hormone.

Alafi:

I’m not someone that goes too much into detail. Stan will tell you, and there will be other people who really know it. But I am telling you, the dean of the medical school, my ex-professor, [Leslie] Bennett, said, “Moshe,”—he is really an angel; he said —“how dirty they were, I can’t even believe it or explain it.” That’s Genentech. They were thieves; that’s really what I think. But they won financially.

Hughes:

They did win. I mean, Genentech is going strong, and where is Cetus?

Alafi:

Yes. Genentech also did great things by accident or whatever. They really got it, right from the beginning, fantastic business people, management. The scientists, the German ones—I can't think of their names—two of them came to court and testified they stole it for Genentech. Since they were part of the patent, one of them made I don't know how many millions for testifying.

Hughes:

Yes, Peter Seeburg.

Alafi:

Okay, you know the story.

Hughes:

Yes.

Alafi:

I knew all those guys. They played dirty. But that's how the world works.

Hughes:

Perkins, as you know, was on the Genentech board for many years.

Alafi:

I know. That's how they started it. Gene told me, he didn't do it; Tom did it. Now he's telling me, "Moshe, I didn't start a competition with Cetus. We have invested in Cetus. Tom Perkins wanted to do it, and that's why he's on the board."

Interview 3: May 15, 2003

[Begin tape 5]

Hughes:

Mr. Alafi, how did you become associated with Cetus?

Alafi:

[long pause] At that time I was doing investments individually, in different companies. We were friends with Don Glaser, and we were friends of the family. His ex-wife and children used to come and swim in our pool. So we were really good friends. One day he came to me and he said he had this technology that was doing thousands and ten thousands of modifications of bacteria, and he was studying evolution, really. And he had a big grant from NIH or something for millions of dollars. He said that technology should work to produce new mutated bacteria, producers of antibiotics for example, and we'd find better, higher producers, using his technology. That would have implications for production costs, because at that time, when you were producing antibiotics in bacteria, you had to have these big vats which cost tens of millions of dollars. So for example if you doubled the yield, you'd cut the cost by half.

Hughes:

I see.

Alafi:

I remember I asked him one question. I said, "Do you really think it works?" And he said, "Science always moves, and if it doesn't work, ultimately it should work." Then he said he had met two guys—I forgot if he said one or two—and that's Ron Cape and Farley. And I think he met Cape because at some time he was finishing his Ph.D. in Stanley's virus lab.

Hughes:

He did his post-doctoral work at Berkeley.

Alafi:

Is it postdoctoral? Okay.

Hughes:

Yes.

Alafi:

So Don said, "Why don't you meet them and see if we could start a company?" So I met Cape and Farley. Farley was an M.D., but he had gone to business school. He was practicing medicine at night or something. They were looking for things to sell to venture groups. So, I met them, and I was impressed because they really know how to talk. And they are the ones, I really believe it when they say, "You can sell the Brooklyn Bridge." They know how to do it. [laughter] Anyway, they are impressive because they have competence, too. I knew Wall Street people, people at Montgomery. Cape wrote a business plan, and we raised I think two million dollars in a few days.

Hughes:

From whom?

Alafi:

Investment bankers at Montgomery Street that I knew.

Hughes:

This is maybe 1970, '71?

Alafi:

That's the date I have to--

Hughes:

The beginning date for Cetus is 1971. It actually incorporated in 1973, but when you read the history, they always talk about 1971 being the beginning of the company.

Alafi:

I remember I put money in at the beginning, and I think I even loaned Farley money to start it.

Hughes:

Last time, you talked about founding your first company.

Alafi:

Physics International.

Hughes:

Yes. You talked about the fact that there wasn't a venture capital community--

Alafi:

Correct.

Hughes:

By 1970 is there a venture capital community?

Alafi:

Not really. Here, you see this chart?

Hughes:

Yes, you showed me.

Alafi:

I was doing things way back—yes? [Approaching chart on office wall]

Hughes:

Since 1960.

Alafi:

Then Murray Hill—I had this venture group with Carter—yes?

Hughes:

Now, why do they have you cited again?

Alafi:

Because then here I did it on my own. Then I did other companies. Then I formed a partnership.

Hughes:

Oh, that's you!

Alafi:

Yes, Murray Hill [Scientific Investment Company]. With Carter's son-in-law. And then it ended somewhere here maybe. [points to year on chart] It's really at the end of this thing when Cetus was started.

Hughes:

You talked about Murray Hill last time, but you didn't give it a name.

Alafi:

Yes, I had a limited partnership with Carter's money, and I started companies with that fund.

Hughes:

All right.

Alafi:

Then we [Cetus] went and raised the money really quickly, because at that time I knew a lot of investors. It was not called venture capital, even though that's what it says there. It was called making a living.

Hughes:

Were these mainly investment banks, where the money came from?

Alafi:

Yes. From San Francisco, and they brought their partners or friends. And I am trying to remember—they brought an oil company, not Standard Oil of Indiana, another company, in New York. And we went and saw the chairman, and they put money in, too--part of that two million, I think.

Hughes:

But in terms of individual contributions, there were just three: Farley, Cape, and you?

Alafi:

Yes. I was the chairman. Cape was the CEO, and Farley was president.

Hughes:

Now, getting back to Glaser's technology--

Alafi:

And Glaser was a partner—yes?

Hughes:

Did he put money in?

Alafi:

No.

Hughes:

Did his technology make the mutations, or was it somehow picking out the mutated organisms that might be more productive?

Alafi:

No, it mutates by ultraviolet radiation and picks the mutants. That was his idea of looking at how nature does it: you get mutations, and some survive, some die. [tape interruption]

Hughes:

In this project, we're trying to get your vision of what's happening to venture capital, and so I ask: When you collectively went to these investment bankers and tried to sell this microbial screening device, were they receptive to the idea of investing in technology?

Alafi:

It really was just the beginning. There were selected groups who began to see that there are other ways to invest than standard investments. I'm trying to remember the name of the oil company that put money in Cetus. Their money was made in oil. All of a sudden, they started hearing that you really can have pharmaceutical products done outside the realm of pharmaceutical companies. That was new!

Hughes:

And they were interested?

Alafi:

Yes. But prior to that, there was HP [Hewlett-Packard] already. There were people on the Peninsula who were already in electronics, who were attuned, not the way Silicon Valley is today, but it was the beginning then, too. So there were bankers who knew about those things that were happening on the Peninsula, and now all of a sudden, we are talking about applying technology to find new drugs or improve drugs. And that was a new idea, because in the olden days, everything goes from universities: professors are being given honoraria or consulting, and everything goes to the pharmaceutical companies. That was the beginning of a practically new concept. And the proof is later, to jump ten years or so. When biotech started doing gene-stitching, et cetera, the pharmaceutical companies were so threatened. Why? Not because these small companies can threaten them, but what if they can find something with their new technology in a very short time that they will take to their competitor? That changed the whole system.

Venture capital wasn't as it's called today. Investors in the beginning were people from the industry who had money, people who were aware of a technology. It could be in Boston where Polaroid started, you know. All of these things were hovering. And then all of a sudden came something new, biology.

Hughes:

Do you consider that Cape and Farley were among the first to realize the commercial potential of biology?

Alafi:

No. It was really Don Glaser. It wasn't them. They were trying to get any job. They found a new way, a vial I think, to collect blood. They came up with so much crap. It was Glaser who said, "This is my technology. It will do this." And they were really desperate. They would have taken anything. I remember they brought me something where you could constantly monitor your EKG. I said, "How do we do it, and how do we sell it?" Farley brought one thing in his pocket. He showed me. It was a vial. I'm just giving you an example. Glaser said his technology could mutate and find new mutated bugs that can be higher producers. He said we can do that with the pharmaceutical companies.

Hughes:

Do you think you would have gotten involved if Glaser hadn't been a friend of yours?

Alafi:

Would I have been involved in starting the company?

Hughes:

Yes. I'm trying to find out how convinced you were that Glaser's technology was going to be a success.

Alafi:

I had started so many companies, and I really started to say, "This is not the right company," after starting so many. This is not it because it doesn't have all the right things—not the right technology, not big enough. So I was looking, trying to find what would be something really ideal. So, when Don said this, it struck me as something big. It was a fantastic gamble. I had nothing to lose, anyway. The Arabs have a saying, "A penniless man is safe in a caravan." I didn't care if it doesn't work—yes? And a Nobel Prize guy, I respect him. If he says it works, why shouldn't it? As a matter of fact, because of his name, quickly we raised the money.

But subsequently, Cape and Farley used him, used Lederberg. They would go and make presentations, and say things that Lederberg used to be ashamed of, because they were making false statements, like we could do this, or we have this. And one day, Carl Djerassi, who was on the board, came to me. He said, "Moshe, Lederberg is so incensed!" It seems he was at a meeting with Cape and Farley. I don't know what they said, what the conversation was. Djerassi said, "They were completely lying." And I said that immediately to Cape, and he tried to cover up for Farley. And this is true; I know Djerassi right now. As a matter of fact, later he had some of his father's money invested in the company, and when he knew they were playing games, he said at a very early stage, "I want to sell my father's stock." So what am I trying to say? They knew how to sell it.

So I was trying to find an ideal company. Don Glaser—I thought that is maybe what I was seeking; maybe that's the dream. At that time a Nobel Prize was a big thing, and he said it should work.

Hughes:

Is your idea that you want to build a company with wide significance, or do you want to make money?

Alafi:

No, I was making money anyway. No, I wanted something that I really felt was significant, that not everybody could do, not a me-too. I could not compete with a me-too. The only thing is to get the right people with—revolutionary is not the right word—ideas, that you could really say, “It was worth it.” All of my investments were like that, as a matter of fact, whether Biogen, Amgen, all of these companies. For example, yesterday the FDA approved Tanox for asthma. Genentech is in it, Tanox, Novartis. I started Tanox, and they made a deal with Genentech.

I am trying to show you what I was thinking. I always thought, not run-of-the-mill companies. Of course we did make mistakes, a lot of them. So that was my idea with Glaser’s screener: this would revolutionize something that nobody else could do. The proof is we convinced Schering-Plough to put seven, eight, ten million dollars.

Hughes:

Well, talk about that, because you had the connection with Schering-Plough, right?

Alafi:

Yes.

Hughes:

How did that all happen?

Alafi:

I am trying to remember. Cape and Farley started talking to a lot of pharmaceutical companies. They know how to talk, you know? They visited a number of these, and a lot of companies said, “No, we don’t want it.” As a matter of fact, they went to Novo-Nordisk in Denmark and tried to sell them improved ways to produce penicillin. Is it penicillin? Yes.

Hughes:

I know them as producers of growth hormone.

Alafi:

Yes, that’s what they are. I went there and saw their production facility was all automated. And they said, “No, we don’t need you. We have the most efficient—” I still remember, I said to Cape and Farley, “Let’s do it for them free. But for every 5, 10 percent improvement, we get a certain percentage.” And they accepted that. We made an agreement with them, but we were never able to do anything; it didn’t work. Ultimately, Schering-Plough was producing gentamycin using microspora; it was one of their biggest antibiotics. It was the antibiotic of last resort. Don Glaser came, and I don’t know if Lederberg was sitting there too, and they made the presentation. They wouldn’t show them our technology; they wouldn’t let them enter another building, because it was secret. It’s all petri dishes. They knew how to say, “Oh, it’s top secret.” And Cetus convinced them, and Schering-Plough started putting millions--maybe seven to ten million dollars—yes? We gave them a report, and Farley changed the report. Even though the

scientists wrote it, he could play with it. I remember once the president of Schering-Plough said, "I can't understand that bullshit! What's he saying?!"

Hughes:

[laughs]

Alafi:

And then it came to a point where Don Glaser assembled the chairwoman of statistics. She came from UC. I took courses from her. I can't recall her name. I think she brought another professor with her. She looked at the data, and she told everybody, "If you flip a coin, you'll do just as good as the microbial screener." I felt so shaken, I honestly couldn't sleep at night. I said to Don, "I don't like the idea. I think we should tell Schering." I remember he said to me, "Moshe, if you tell them, I will sue you." He's my friend. "Don, I can't sleep at night." So I called the chairman. I told him, "I want to discuss something with you." He sent the head of research. We had a house at Tahoe. We went with him and spent the weekend. I owned at that time 12 or 15 percent of the company. I said, "This is the fact. This is what the chairwoman of statistics says. I don't think you should fund us." He said, "But that's your company." I said, "At least I feel good." That really made a major split.

Hughes:

I can imagine.

Alafi:

Djerassi, and I said to Djerassi, "That's correct." And that's when he said he wanted his father's money back.

Hughes:

Now, was Cetus based on that technology alone?

Alafi:

Yes. That technology alone until Stan Cohen came [as a Cetus advisor], within a year or so before I left. He said look what he and Boyer did. "You really should give up what you're doing. And this [recombinant DNA] is the technology of the future." Cape was in Hawaii. I was with Djerassi, and I said, "Okay, we should give up everything concerning microbial screening and that's what we should do now." Cape came back all of a sudden. I don't know if he was jealous or something. He said, "No!" But then once he looked at all of it, introducing recombinant DNA technology at Cetus became his thing. I didn't care. I was trying to sleep at night.

Hughes:

How did Stan sell the technology to you?

Alafi:

He said to me, "This is a technology that is really effective. This is the technology of the future, and you could do it without a lot of paraphernalia." We had a whole building for microbial screening, putting petri dishes, et cetera.

[Begin tape 5, side B]

Hughes:

Lederberg knew about recombinant DNA because--

Alafi:

Actually, Stan jumped ahead of him. Lederberg should have done that. But Stan was working with Boyer.

Hughes:

You mean, Lederberg should have done it because he was already associated with Cetus?

Alafi:

No. At Stanford, this whole gene-stitching, whatever you call it, Stan and Boyer did.

Hughes:

Yes.

Alafi:

Lederberg was the father of genetics. Stan jumped or was lucky—I don't know. But they both said that's what we should do. So that was the beginning, okay?

The timing I can't recall. International Nickel—they had a venture fund—came and wanted to put money in Cetus. But we didn't need money. We already had raised money. So they went and put money in Genentech. And Genentech was funded by Kleiner Perkins. And Kleiner Perkins had money in Cetus before they started Genentech.

Hughes:

Right.

Alafi:

And Swanson had the investment book of Cetus, but Kleiner Perkins wanted to kick him out. They didn't want him anymore because they were making the decisions. So Swanson came to me. He gave me his resumé. He said, "I have looked at the investment book. This is great technology. I want to work at Cetus." I went to Cape and Farley, and they smelled blood. They really got scared. They said, "No, he's no good."

Hughes:

Now, what do you mean by that?

Alafi:

They were afraid of him. He looked, you know, thirsty. Instead, he went back to Gene Kleiner and Tom Perkins. Swanson went to Boyer, and Boyer said, "Give me either fifty or eighty thousand dollars, and we'll prove something." Kleiner Perkins gave him either fifty or eighty thousand and kicked Swanson out. But for that, they made hundreds of millions of dollars, because they got a big part of Genentech.

When they started Genentech, Gene Kleiner came to me apologizing, really. He said, “Moshe, I am a friend of yours. We invested in Genentech. I didn’t do it. Tom Perkins did it.” I said, “Gene, I don’t care. Don’t worry.” So, that’s when he started Genentech. And at that time, I had the ex-chairman of Schering-Plough, Longman, on the board of Cetus. I told Longman what happened and what I thought and what I did. And he said, “My God, I didn’t like those guys anyway.” So he resigned from the board of Cetus. Then Genentech said, “We need somebody to help us.” I don’t know if they put Longman on the board as a consultant, and he’s the one who negotiated their contract with Lilly on thyroid or something.

Hughes:

Insulin.

Alafi:

Insulin.

Hughes:

Insulin and then growth hormone.

Alafi:

According to Stan, he was trying to get Cetus to start different projects using recombinant DNA, and one of them is growth hormone. And Stan will give you this account. Cape said, “How many dwarves are there in the United States?”

Hughes:

Let’s take ourselves to the mid-1970s. The microbial screening, all of Glaser’s stuff, is beginning to fail.

Alafi:

But he never admitted it.

Hughes:

The statistician comes in and says, “This technology isn’t doing anything.” Do you think that that failure is one reason that Cape and Farley were receptive to taking on recombinant DNA?

Alafi:

Oh yes, that’s another reason. But somehow they didn’t know what to do with it.

Hughes:

Well, who did they have to do it? What scientist came in to do recombinant DNA? Did David Gelfand come right away?

Alafi:

No. He came a year or so before I left.

Hughes:

You left in ’78.

Alafi:

Yes.

Hughes:

Cape and Farley have been convinced by Cohen and Lederberg to take on recombinant DNA, but there aren't that many people in the world at that time who know how to do recombinant DNA.

Alafi:

Yes, and that's what was lucky or smart of Genentech. Swanson got, somehow, the best people. He got the Germans.

Hughes:

Ullrich?

Alafi:

Axel Ullrich, and--

Hughes:

[Peter] Seeberg?

Alafi:

Seeberg. Swanson did that, and we didn't have anybody similar. You could ask Stan how come he didn't convince Cape and Farley to have some of his students or technicians go to Cetus. They hired somebody who was working on IL2.

Hughes:

That early?

Alafi:

No, subsequently. What I'm saying, they were playing with other things. I remember the statement of Tom Perkins. "What the hell, they are screwing around, and here we are." Because at the same time, they had this whole monster. They were churning things.

Hughes:

So the microbial screening was still going on?

Alafi:

It's like the emperor has no clothes.

Hughes:

[laughs] How many people were at Cetus at this stage, and who was doing what?

Alafi:

I can't tell you. It was all geared to that major project with Schering, and I'm trying to remember if they had any other project. I can't recall. And we had a whole separate building.

Hughes:

The one in Emeryville? Or were they still in Berkeley?

Alafi:

Berkeley, on Fourth Street.

Hughes:

That's where Glaser's screening apparatus was?

Alafi:

Yes. And they were making special plasmids, too.

Hughes:

Well, you know, what else is going on in the wider world is the recombinant DNA controversy. Remember?

Alafi:

And they went to--

Hughes:

Asilomar.

Alafi:

Asilomar.

Hughes:

Right.

Alafi:

And then they had a hold on recombinant research. How long was that hold?

Hughes:

Well, they had to hold certain types of research until the NIH guidelines came out in June, 1976. Not all of recombinant DNA research stops, but the kinds of recombinant DNA research that are believed to be potentially dangerous, are put on hold.

Alafi:

Yes, I remember that.

Hughes:

The other controversy that is combined with all this is the stigma that is attached to academic biologists going into industry.

Alafi:

That's right.

Hughes:

I'm just wondering if Stan, as the co-inventor of recombinant DNA, as one of the spokespeople for "this technology is not dangerous," is a little hesitant to become deeply involved in a corporation. Do you see where I'm going?

Alafi:

Yes, it's a good question, but Stan was pushing Cetus to work on projects.

Hughes:

Yes, but he could have left Stanford and joined Cetus.

Alafi:

He didn't, and he didn't want to. None of them wanted to.

Hughes:

Why?

Alafi:

Because a university position is secure; they could have their cake and eat it too. He didn't have to go. They were not that committed. They didn't really see--nobody saw the breadth of what recombinant DNA could be. And you know, he's a professor. Probably he is thinking that he should get a Nobel Prize. I don't know what goes through people's heads.

Hughes:

Do you remember hearing discussion around the subject of biology professors going commercial? Of course, chemists and physicists had been associated with industry forever.

Alafi:

Yes. I always had trouble with professors saying either they don't trust business people or they don't want to have their names associated with making money. When Biogen was ready to go public, the American scientists including--

Hughes:

[Walter] Gilbert?

Alafi:

Gilbert, Phil Sharp, the European ones, Weissmann, et cetera, delayed us. We almost didn't make it for at least a year, because they did not want their names to be published there. They had started making money. As a matter of fact, there was a publication, I don't know where it came, in *Nature* maybe. A professor in Geneva—I forget his name—wrote, “How can Charles Weissmann dirty his hands in this company.” And Charles wrote a beautiful article, saying, Yes, they were all afraid. But they were also fighting how many shares would they get, okay? [laughter] Lederberg got involved with different software companies on the Peninsula. Stan—maybe all of these things went through their heads.

Hughes:

Well, let me see what else I have on Cetus. One of my questions was who wrote the business plan, and you said that was Cape.

Alafi:

Yes, he wrote it.

Hughes:

And was it a good business plan?

Alafi:

Yes, very good, impressive. As a matter of fact, when we were trying to go public with Biogen, but Cetus did it earlier and wrote a business plan, they were circulating it around groups all over the world. And I remember the associates looked at it and said, "My god, who wrote this business plan? It tells you everything." Yes, he was good. He and Farley, they sold everything. That doesn't mean it was true.

Hughes:

Farley was quoted as saying that he was thrown out of many pharmaceutical and chemical companies when he was obviously going to look for corporate deals.

Alafi:

Correct, to sell them the potential of Cetus' technology for their antibiotics production.

Hughes:

What were they throwing out? Were they throwing out the people? Were they throwing out the technology? Or were they throwing out the idea that a small company could do anything worthwhile in pharmaceuticals?

Alafi:

Okay. I remember the first trip they took to Europe. They were so shocked, nobody would do anything with them. It was the technology, the people.

Hughes:

Now, what was shocking them?

Alafi:

Nobody would take a bite. Nobody would accept to have any contract or anything with them. They were not buying what they were selling. At that time, they were selling Glaser's technology. And nobody believed them. Perhaps that technology seemed like outer space. Actually the Europeans asked, "What does your technology do?" And Cape and Farley said, "We mutate it, and look for a needle in a haystack." They kept saying, "And we know how to do it." And the Europeans said, "How do you do it?" And Cape and Farley wouldn't show them. The company has Don Glaser in it, so it must have something. Also we have Lederberg on the board, so it must be something. And that's how it was sold.

Hughes:

But it didn't sell.

Alafi:

Only to Schering. So when they went and tried to sell it to others, somehow nobody else believed it.

Hughes:

Remember, you told me that it is the Americans who are gamblers, who are risk-takers.

Alafi:

Yes, correct.

Hughes:

So how much is it what Cape and Farley are trying to sell, and how much is it the climate in Europe, which no matter what Cape and Farley came with, European companies would have rejected?

Alafi:

Right. I remember I went with them, just out of curiosity, to see how they were selling.

Hughes:

To Europe?

Alafi:

No, in the States. And I don't know if it was the head of research at Merck or Bristol-Meyer. This guy was the most obnoxious guy. Just jokingly he said to Farley, "Okay, you son of a bitch, tell me what tricks you are selling." So, it's as if they had been talking to them and selling them things. And it was embarrassing. He was pooh-poohing everything. It was a technology that they were not explaining fully what it is. Nobody could give you something today without believing in their technology. They told them they had Lederberg, a Nobel Prize winner. Looking back, I wouldn't do anything with them. They were so smart, you know, and so shining, and they had answers for everything. And they didn't have proof that the thing worked. Not one example.

Hughes:

Well, thinking again of Genentech, proof is what Genentech very quickly had. They focused on the one technology, which was recombinant DNA, and they pushed it to prove the technology first. That's what that somatostatin work did.

Alafi:

Yes, that's what they did.

Hughes:

Here was a competitor right across the bay from Cetus. Weren't Cape and Farley, and maybe you too, watching what Genentech did?

Alafi:

I had already left. We started Biogen. I left when?

Hughes:

You left in '78.

Alafi:

By that time, I already had had at least a whole year of war with them. Cape and Farley were so convinced they were better and they were going to find or do the big things. And they didn't have anybody in terms of business types like Genentech had. They didn't have the scientists that Genentech had. They had scientists who worked for Glaser. And Genentech got the people who could really do things right away. Swanson, really by luck, collected the best available, and

Cetus were big talkers, yes? Stan was so frustrated with them. He will tell you. Even they had the PCR at last, they didn't know what to do with it. They screwed it up. They were losing eighty million dollars a year even then!

Hughes:

There was this prestigious scientific board, which right away had Lederberg, a Nobel Prize winner, and Cohen. Djerassi?

Alafi:

Was on the main board.

Hughes:

And you of course were chairman of the executive board. How involved was the executive board?

Alafi:

I really was there the whole time, yes? And I was seeing all the bullshit. I told Djerassi that. The board was really manipulated. Djerassi is the only one who saw it. Stan Cohen started to see it early. Lederberg almost didn't see it, except he was embarrassed by Farley. He was impressed with Cape. He even put him on some committee or something at the Rockefeller. The executive board was not as involved in terms of, "What the hell are you doing now?" Cape and Farley always were promising them the next project, and in the next six months, we'll do better. They were not what I would call today an involved board that should have shaken the whole system. I was so upset, I had to leave. I had to fight, and people don't want to fight.

Hughes:

Who was on the executive board?

Alafi:

Farley, Cape, myself, Djerassi. [pause] Then when we sold some stock to Standard Oil of Indiana, we got one of them, yes. The attorney maybe was on the board, Julien Stern. I can't recall the others.

Hughes:

[Alejandro] Zaffaroni?

Alafi:

He was not on the board; he was an investor. I remember he came and put in a hundred thousand dollars. It was not the first round; it was the second round.

Hughes:

His companies were up and running?

Alafi:

Alza—oh, yes.

Hughes:

So Alza came well before Cetus?

Alafi:

I think so.

Hughes:

But after Syntex?

Alafi:

Oh yes, much after Syntex. Zaffaroni and Djerassi worked together in Mexico City, on the contraceptive pill. Then they came back and Zaffaroni started Alza.

Hughes:

How unusual was it to have a company founded on a strictly biological basis?

Alafi:

You mean Cetus?

Hughes:

Yes. But then you've got Syntex, which was not working with living organisms--

Alafi:

Cetus started as Glaser's technology application to biology. Djerassi was a chemist.

Hughes:

Right.

Alafi:

So what's the question?

Hughes:

It's not a good question. What I was trying to figure out is whether Cetus could be called the first company to be biologically based.

Alafi:

I don't know if you could say that. Maybe.

Hughes:

I mean, who else would there be?

Alafi:

It was unique. That's why it sounded interesting. Yes, I think it was unique. Oh, there was a company in Korea or somewhere. Penlab it was called. An American was mutating--

[Begin tape 6, side A]

Hughes:

That was founded about the same time as Cetus?

Alafi:

Or before, even. I remember when people started comparing Cetus with Penlab, I said, “Oh, we have a major thing [the microbial screener], a whole building, and Lederberg.” I remember Japanese came from Japan, and Don Glaser talked to them, and Cape and Farley talked to them. They wanted to see the machines because they wanted to make a deal with Cetus, and Cape and Farley wouldn’t show it to them. And I still remember Farley kept saying to the Japanese—I still remember how he acted. He said, “Oh, Dr. Glaser, a Nobel Prize winner.” They asked as to how did he do it. And they wouldn’t show anything. They wouldn’t let them into the building! [laughter] Standard Oil of Indiana put money into all of this, and they wouldn’t show them anything. It was the biggest magician’s tale. I felt, To hell with it! I can do better.

Hughes:

[laughing] Well, once again we’re wandering through Cetus history. All right, should we talk about Biogen?

Alafi:

Fine.

Hughes:

In 1978, you leave Cetus, and you said it was because you broke with Cape and Farley.

Alafi:

Yes.

Hughes:

How did the connection with Biogen happen?

Alafi:

Inco, International Nickel, wanted to invest in Cetus. We didn’t need any more money so they went and invested in Genentech, yes? I don’t know when Shaffer called me, and he said, “Would you be involved in a new company? We want to start a company in Europe.” And that was a dream for me because I always thought it’s ideal to have a company there, and a company in the States. I said, “Yes.”

Hughes:

Because you like to travel?

Alafi:

Yes, and I have relatives abroad. Also, I always wanted to see different people, do different things. Also, I thought, it’s new for Europe; it’s an American phenomenon; it would be fantastic. And they said, “We will assemble the best scientists and have a meeting in Geneva. We invite them there.” I think it was at the Richmond Hotel. “And, we will give a presentation, and we want you to come too, and see if we could convince one or two of those nine.” So they invited the nine, really the biggest names, yes? They knew how to prepare a plan, start a company. They talked to each one of them, and put their names on a fancy write-up, and brought it, and said, “We will have a meeting.”

And they had a meeting, one or two days at the Richmond Hotel, with fancy dinners and drinks. I talked about Cetus. I talked about Genentech. And I said to them, “There are nine of you, and with two or three, one could make really a major company,” I believed. Then they said, “Okay, we’ll go and discuss it and come back.” I’m cutting the story short. I think Wally Gilbert was the first one who said yes, and Phil Sharp said yes. Then all nine of them said yes. I said, “Oh my god! If *perestroika* doesn’t work, how is this going to work?” So we sat with Inco and Kevin Landry from T Associates in Boston and worked on a plan that each of the scientists gets to join the company, gets a number of shares, all equal, yes? Then assign projects—which project do you want to work on? And each project has a number of shares that comes with it. And based on performance, they get additional shares.

Hughes:

Where did that system come from?

Alafi:

We had all the attorneys—everybody sat and came with different pieces. There wasn’t anything like this ever before. And then how much stock do you give each one? It was a bargaining thing, you know? They knew what worked at at Cetus. We knew also what happened at Genentech. But Biogen was different, yes?

Hughes:

Because everybody was spread out across Europe. They weren’t in a company, really.

Alafi:

Right, it was a virtual company still. Then, there’s the issue: They were all going to work in their labs in the beginning, until we found a lab, until we found a president, until we found a place. So they assigned projects. For some reason, Charles [Weissmann] got the interferon. Ken Murray—he became Sir Ken Murray in England—did the hepatitis vaccine.

Hughes:

The choice of these research projects made sense because people had been working on the topic?

Alafi:

They had been thinking about these projects. Every company had the same list—Genentech, everybody. And then there was EPO[GEN], erythropoietin. We almost had it. Genentech almost had it. We were really neck and neck.

Hughes:

So Biogen was working on EPO as well?

Alafi:

Of course we were. We were working on--

Hughes:

Hepatitis.

Alafi:

Yes, and interferon.

Hughes:

And insulin.

Alafi:

Yes. Wally was working on insulin. If it works in Dr. So-and-So's lab, you put money in that lab. Also you give them money. Because where else would we do it? And all of these are the weaknesses of Biogen, yes? Charles was the one who cloned and expressed interferon on Christmas night. Somebody asked him, "What's the significance?" Charles is Jewish. He said, "The significance is Jesus was a Jew." [laughs] And within the first year—maybe I'm exaggerating—first year and a half, Ken Murray delivered the hepatitis B vaccine in Scotland. So we did the major thing that started giving them hundred fifty million a year in royalties.

Hughes:

But remember that [William J.] Rutter's UCSF lab was working on a hepatitis C vaccine.

Alafi:

But Biogen must have beat them because they have all the patents. All the hepatitis B vaccine you get is Biogen, from all over.

Hughes:

Well, Merck--

Alafi:

Merck vaccine came from Biogen, I am told. So they have patents. How come? Or licensed it.

Hughes:

I've forgotten that part of it. But there certainly was a race for hepatitis B vaccine.

Alafi:

Oh yes. And for interferon.

Hughes:

It may be that Biogen's vaccine superceded the one that Rutter's group was on the way to producing, hepatitis C.

Alafi:

I think so, because I know that Biogen made agreements, and they were getting maybe seventy million dollars a year from a number of those agreements.

Hughes:

But I also know that the most lucrative patent held by UC is one related to hepatitis B.

Alafi:

I don't know.

Hughes:

But really it underlines your point: everybody at this early stage was working on the same thing!

Alafi:

Because, as Charles Weissmann used to say, “These were the ripe fruits ready to be picked.” That’s why it’s harder now for anybody to cure cancer.

So then we started the company, and then we wanted to have a space. Unfortunately, the space that was available was in Geneva. Charles Weissmann wanted it in Zurich, close to him. And if we had it close to him, I’m sure we would have had EPO and all of these because of the way he works—from seven in the morning until midnight, even today. We couldn’t find a lab ready in Zurich. So they got one in Geneva because they could put people in and hire immediately. That upset Charles so badly. We had a meeting in Davis and he said he would quit. So Kevin Landry and I went to his beautiful chalet. We became very close friends. I said, “Charles, you can’t kill us [Biogen]. You leave, and everybody can do the same.” He said, “Okay, then I want one thing. I want to be a board member, and you cannot remove me even if you go public.” I said to myself, he doesn’t know that’s a blessing for us. I said, “Okay!” [laughs] We would have begged him to do that, because with his name— He was smart, he had a business head, and all of that. Then Geneva was started, and we hired people, and we had an attorney from Inco who was with Shaeffer, the initiator.

Hughes:

Dan Adams?

Alafi:

Yes, who really was responsible with Shaeffer to initiate all of that with Inco. It was running in a half-assed way, until we got Rob Cawthorne. He was the first CEO, and he came from Pfizer, I think. He was in marketing in Europe. He’s very smooth. Ultimately he ran Rhone Poulenc. But Biogen was something he really never understood. He’s a marketing guy. He knows pharmaceuticals. But this is an R and D company. He really didn’t understand it. Then Wally Gilbert got so upset—more and more and more. And that’s when he accepted to take a leave [from Harvard] and to run Biogen.

Hughes:

How did that work?

Alafi:

A disaster. Everybody said, “Wally is the smartest, not just a scientist.” You’d discuss anything with him, he is smarter than the attorneys, than the accountants, than anybody else. He really is smart. But he also ran the company like a graduate school. We thought somebody who ran to get the Nobel Prize would be a driver. He was so arrogant in terms of science. All the scientists say they’re afraid, when he comes to Geneva, to talk to him because he makes them feel like shit. His wife didn’t want to come to Geneva because it’s boring, so she comes and goes to Paris. So he goes to Paris. He did not run a company like a company. I am repeating: it’s like a graduate school.

Ultimately we opened a branch in Boston, and that was another disaster because the scientists, the Europeans, were competing on the same project with Boston, and they wouldn’t even share the information, yes? That was another mistake that Biogen did. It was not run professionally. At some point we said to Wally, “You can’t do it like this.” Actually, he was dumped by the board,

and I remember he was so upset. I said, “Wally, you are better off this way. Let somebody come who can make it. You are still on the board. And you’ll be a hero.” I still remember he said, “Thank you.” And his wife said to him—she never liked all of these scientists, “Come, I have champagne for you.” And they immediately went with [David] Baltimore in the Pacific on a yacht trip. Ultimately, we looked and looked, and we found Jim Vincent.

So, the mistakes that Biogen did: It was not run in the beginning as a company. It was really more different scientists in different labs. It didn’t have a coherent concept how to do it, except ‘we will do things,’ and ‘we will conquer the world.’ We did not have anybody who understood the pharmaceutical companies. Genentech in a sense did almost everything right. And we could have been further ahead if we just had a CEO who came from the industry, right from the beginning. Things would have been much different.

Hughes:

These scientists at Biogen are at the top of their fields. These are heads of laboratories!

Alafi:

Oh, yes.

Hughes:

The scientists at Genentech are twenty-year-olds!

Alafi:

Hard workers, coolies.

Hughes:

Yes, and they’re not expecting to run things. They’re just there, doing the science. I was interested in whether they were interested in the business aspects of Genentech—very little. They were focusing on the science.

Alafi:

Correct.

Hughes:

I wonder if that wasn’t one of the problems at Biogen—that the scientists were getting too involved in the business? Well, look at Wally Gilbert. He’s running the company. Where is his expertise?

Alafi:

Oh, you’re right. Common sense. The scientific board actually dominated the main board, because they were in it too. Biogen could have put money in Amgen and got a big part of it. And they voted against it, five to four.

Hughes:

Why?

Alafi:

At one point my friends, the investment bankers, were starting Amgen. And they said, “If Biogen will put some money, it validates us.” I invited Phil Sharp to Los Angeles, and he saw all his friends, and he said, “That’s great.” And I thought the board was going to say, “Yes, we’ll put money in.” They shifted. Wally shifted. It was five to four against it, in Paris. They said, “Why duplicate?” It was arrogance. I was so mad, I said, “Okay, then I’m going to invest in Amgen.” They said, “No, you can’t; you are on the board.” I said, “How about Chris [Alafi:]?” He was fifteen, sixteen, and he made more money than I make.

Hughes:

I was re-reading Weissmann’s paper, “Cloning Interferon and Other Mistakes.”¹ He mentions that on Christmas Eve his student found that there were measurable amounts of interferon, mind you, minute amounts. He called you, and you arranged to send an attorney over who got immediately on a plane and arrived in Geneva on Christmas Day.

Alafi:

The attorney that we were dealing with from the East Coast, he just couldn’t get him. He was skiing in Vermont or somewhere. So I was calling every goddamn thing to reach him. And he got on the plane and went there.

Hughes:

This was somebody that you had worked with?

Alafi:

Somebody that the company had already been working with.

Hughes:

When you become involved with a company, do you usually suggest who the legal counsel might be?

Alafi:

No. They already had a legal counsel. I wanted to have legal counsel from here [California], and they said it doesn’t make sense. So they got a fantastic one on the East Coast, Jim Haley; I still remember him. I knew a lot of things that were happening. Once I stayed in Geneva for a whole month looking at who was doing what, because it was so exciting and important to me. We didn’t have a CEO that was pulling everything together. I made a whole list of suggestions of what I thought they were doing wrong. The CEO spent half an hour with me. He said, “I know all of these things.” I knew, that’s not his meat. That’s not the way to run that company.

Hughes:

Another thing you did for Biogen—remember, Biogen was close to bankruptcy? What did you do?

Alafi:

I called the same people at Schering. They know my integrity. I am the one who called them and said to them, “Cetus is bullshitting.” So I called the chairman, Bob Luciano, and I said, “Biogen

¹ In: *Interferon 1981*, vol. 3, Academic Press, 1981, pp. 101-134.

is doing something worthwhile for you to come and see and invest in.” We had a meeting in New York with the head of research, and I think the chairman was there too. I think we got eight million dollars from them. I don’t know why that number is sticking in my head. For that, they wanted a choice of two or three projects. They will pay for it, and they can take it and sell it worldwide.

Hughes:

Probably one of them was interferon.

Alafi:

Yes! I don’t know what the other two projects were. Ultimately they dropped it. I don’t know if EPO was one of them. Then we had to sit and negotiate. I remember that I had Kevin Landry from T Associates with us too. And they said, “Okay, eight million.” It’s nothing, you know? They are investing in the company. It’s peanuts—yes? But you have to support the scientists in charge of whatever projects also. We started talking about royalties and discussed it with Kevin, and I remember we said, “We’ll tell them 10 percent.” And we said, “Ten percent,” and Luciano said, “Okay.” Immediately I thought, Oh my god, we really sold it too cheap. I said to Kevin, “Let’s talk.” We went outside, and I said, “I think we sold it too cheap. I want to increase it.” He said, “To what?” I said, “Fifteen.” He said, “Are you crazy? They will kill you!” I said, “No, let’s go in.” I said to Bob, “Ten percent is fine, but once you reach fifty million, I think 15 percent is fair.” He said, “Why?” I said, “You’re going to make so much money after that.” He said, “Do you know how many drugs go to one hundred million? Not too many. Let’s make it after a hundred million you’ll get 15 percent.” I said, “Great!” I thought, this way it looks good on our I.P.O. But then later, it was selling close to a billion—seven hundred and fifty million—at 15. Biogen lived on that royalty, plus the hepatitis thing. I don’t think I would have been able to do it if I hadn’t established honest confidence with them. Also they know how to come and get it. Also it was a new technology.

[Begin tape 6, side B]

Alafi:

Schering wanted to take interferon early in the game. They wouldn’t trust him until he really developed it. Then they bought DNAX because they wanted to say they have a company in biotech. I remember when they bought it, we said they bought walking assets. DNAX has never produced anything yet, I don’t think.

Hughes:

I think I told you that I talked briefly with Hugh D’Andrade at Schering. I’m paraphrasing of course, but what he essentially said was, in a sense it didn’t matter that DNAX didn’t produce. Schering wanted to be seen as involved in biotech.

Alafi:

Correct. They wanted to say that they are in that field.

Hughes:

Is there anything more that you want to say about either of those companies?

Alafi:

I don't know. I'll think about it.

Hughes:

Well, why don't we stop for today.

Interview 4: June 5, 2003

[Begin tape 7]

Hughes:

Mr. Alafi, last time we talked about Cetus and Biogen, and following quickly on Biogen's heels was the formation of Amgen in 1980. Can you say how you became associated with the company?

Alafi:

By that time, Biogen had already started; I was on the board. I have a friend, Bill Bowes—he is very big in San Francisco—who is an investment banker, who I had also on the board of Cetus earlier. He was never happy with Cetus' management, who weren't happy with him either. After I left Cetus, he stayed on the board for a year or two. He came to me and he said, "I would love to start a company similar to Biogen." Then he and somebody else started talking to the group of scientists associated with Amgen. A lot of them from Caltech, some from UCLA, and maybe some from the East Coast—I can't recall. And somebody from chemistry in Denver who did a lot of the chemistry for Applied Biosystems.

Anyway, Bill came to me, and he said, "Biogen has big names. It would be great if we [Amgen] are trying to raise money, and Biogen would invest in it. Then it is validation by major scientists, you know?" And I said, "That's great." I remember I had Phil Sharp from MIT fly to Los Angeles. We had a dinner in Santa Monica in one of the Mexican restaurants way up in a hotel. And the prospective scientists from Amgen were there. I can't recall how many of them. And they sat and talked about what they wanted to do, what Biogen is doing, and then later Phil Sharp said, "That's great."

Then we were going to have a board meeting in Paris for Biogen. I convinced at least five of the scientific advisors who really controlled the company then to invest in Amgen. They were on the executive board, as well. And they said, outside the board meeting, "Okay, we will invest." When we came to the meeting, one of them, I think Gilbert, said, "What do we need them for?" [tape interruption]

He shifted so now it became five to four against investing. I am convinced we could have gotten—people will quarrel with this number—maybe half of the company for five million dollars. And now it's worth sixty, seventy billion! They said, "Why do you want it?" I said, "I am on the West Coast." Some of them, the ones who wanted it, said the Amgen scientists are our peers, they are great. Some of them said it's duplication, and why, when we have a hard time raising money for Biogen, why should we invest in Amgen. I was so upset. Here I was dreaming of another one on the West Coast instead of Geneva. And they voted against it. At that time, the chairman was Robin Nicholson, who came from Inco. He was a scientist, British, and Inco loaned him to Biogen. He was a great scientist, charming guy, the type even if he votes everything against you, you love him.

Hughes:

[laughs]

Alafi:

Ultimately he became Margaret Thatcher's right-hand science advisor. He sits next to her, yes? And he used to come here, we gave him housing. And they voted against it. I was so mad, I said, "Okay, then I'm going to invest!" And they said, "No, you are on the board." I said, "How about Chris's trust invests?" They said, "Okay." So I invested almost all, a penny a share. He still has a tremendous amount. Then they started Amgen.

Hughes:

Was [George] Rathmann there at that point?

Alafi:

No. What's the name of the scientist at UCLA?

Hughes:

[Winston] Saltzer?

Alafi:

Saltzer. They were in the process of raising the money, and they raised money already. I can't recall how much—seed money or something. They gave us stock. I was helping them in terms of what you should do, and what you shouldn't do. Saltzer used to call me and ask all of these questions. At some point, and I can't recall now the dates, they needed a CEO. I don't know through whom, Rathmann was flown to San Francisco, and Bill Bowes and I had lunch with him at the Bank of America building. I was so impressed with him. He used to be at Abbott, and he used to work under Jim Vincent, who later ran Biogen. He was so impressive. But of course this is a different field from diagnostics, but just the beginning. We said, "Here is the offer." I don't know if we wrote it there, but we said, "Okay, we'll hire you." Then he went back to Chicago.

Then he called and he said no, his wife does not want to move from Chicago. Oh my god! I called him. I remember I was in New York on Fifth Avenue in a telephone booth. I said, "For God's sake, fly to Boston. We need a CEO for Biogen, and Wally Gilbert will interview you." He went a few days later or something, and Wally Gilbert interviewed him. He didn't like him. He rejected him. Wally is very smart, but he thinks there is nobody as good as he is. He thinks maybe he's God. [laughter]

So Rathmann went back to Chicago, and soon afterwards he called and he said, "Yes," he would take the job at Amgen. Then they wrote the business plan, and the plan of Amgen had in it instrumentation that ultimately became Applied Biosystems, because Lee [Leroy] Hood was in Amgen, so it was his instrument. I don't know if the sequencer was included or not, but that's the implication. Subsequently, Rathmann started it, and instrumentation was dropped. The same investors, or some of the investors, like Bill Bowes, myself, and others, said, "We'll start a company for instrumentation." And that's how we started Applied Biosystems. The guy from Domain in Princeton, what's his name? The venture group? He was in Applied Biosystems.

Chris Alafi:

Domain?

Alafi:

Yes, Domain didn't come in in Applied Biosystems, and then later he was really upset. He said, "This belongs to Amgen, who are you guys?" So he came in at last and put money in too. That was the beginning of Applied Biosystems. It would have been part of Amgen too, okay? The other thing is Chiron. What's his name?

Hughes:

Bill Rutter.

Alafi:

He was part of the group that Amgen was discussing. When these scientists come in to affiliate with a company, they give them certain shares. Rutter wanted more because he had recombinant DNA capacity in yeast as well. And Rathmann was begging him: "It doesn't make sense. The others will be jealous or something." I think Rathmann stayed at his house in San Francisco one night. Immediately afterwards, Charlie Crocker came and offered him, I can't recall, either ten or twenty million dollars, and that was the beginning of Chiron. It would have been also part of Amgen!

So then Amgen made a list of projects. And one of them, indigo, they were going to work on for blue jeans. Every biotech company was hitting on the same list, and EPO was one of them. Biogen, Genentech, and all of them were neck and neck.

Hughes:

It sounds as though Amgen, at that point, was not aiming to be a biopharmaceutical company.

Alafi:

It wasn't clear. I think it was. I might have the list even. Then later they got, because of Lee Hood, a sequencing machine. They got into the race for EPO. Charles Weissmann asked me to call Lee Hood: would he help Biogen? And he said, "These are great people at Biogen; I would love to, but I am working with Amgen."

[tape interruption]

At that time, I saw Cetus, those guys really didn't know what the hell they were doing. They talked big, but they didn't know anything about the industry, about pharmaceuticals. I saw in Biogen how smart people, but they really were not talking like professionals, "What do you do?" For the first time, he talked like somebody from the industry. He said what should be done. He talked step by step, and not work on five million things. And, "How much is it going to cost?" "What does it take?" "How long does it take?" "And you have to raise more money." So he really had the whole picture already. He studied it, and he knew what he was going to do. We interviewed a lot of people, and they talked big, like Cape and Farley talked, "This is a billion dollar industry," and all of that. This guy, he felt like a captain who knew how to get there. He talked to the scientists too, and they all liked him.

Hughes:

You have to have a firm business sense, but you also have to be able to communicate with the scientists.

Alafi:

Yes, and that whole industry was new. The scientists had never seen that kind of money. They could start companies. So the whole relationship was different. They were not going to work for the pharmaceutical industry. It was their ideas, and they didn't want to let go. All of that was actually done differently in different companies and resulted in different ends. Biogen had the most glamorous, the most fantastic scientists, but it didn't have the business sense as how to move that ship. Genentech, by luck or smarts or something, got all the right technical people. Besides their chiefs, they had good Indians. And the business people were great. They came from the industry. At Amgen, Rathmann came from the industry so he knew how to bring more and more industry people later. At Chiron, you have interviewed them. They did very well, but it took them a long time.

Hughes:

But the founders, Rutter, Penhoet, and Valenzuela, came from academic science.

Alafi:

Yes, but they somehow did the right thing, and then they sold half the company to Novartis.

Hughes:

Were you close enough to day-to-day operations of these companies to say something about the culture?

Alafi:

Well, in Cetus I was the chairman. I was really there every day.

Hughes:

Were you?

Alafi:

Oh yes! Until I left. I honestly felt it's a Madison Avenue operation. They really knew how to tell the stories. And I started seeing that the stories were not correct. Djerassi had seen it too. And that's when I decided sooner or later I had to get out and start something else. They really knew how to have the right consultants who have names rather than substance. They knew how to do just the right publication, the right statements. Everything is rehearsed. I'll give one small example. The Japanese, when they came to visit, Cetus had pictures all over, "Save the Whales." And Cape took them down because he didn't want to insult the Japanese. This is a small thing. Cetus also knew the excitement of the new technology, so they kept touting it, "It's the new millenium," et cetera. Biogen had the scientists. But they didn't have the knowhow, how to translate it into a business.

Hughes:

Do you think at Biogen, it was a question of too many chiefs and no Indians? Or not enough Indians?

Alafi:

Not enough. And the chiefs were trying to do it in their labs. Later when we started hiring people, those people felt castrated by those chiefs too.

Genentech was just unbelievable. They copied the idea, but they did it right. I don't know if Swanson knew anything about it either. He just happened to get the right two German scientists and business people. And he was up, going for the jugular. He really knew how to run—okay? Biogen, on the other hand, had all of these chiefs, but there was no one guy who said, "God damn it, you do it, and you don't do this, and you don't do that." Until Jim Vincent came, and he changed the whole culture. He said the scientific board is just a scientific board, not to control the destiny of the company. He did that immediately, and he said that before he came. He's from Abbott, too. And they are cutthroats in Abbott; you know exactly what are you trying to do, who's going to do it, what are the results.

Instead at Biogen, Gilbert flies from Boston and walks around. The scientists are afraid to talk to him. They are scared. He makes them feel like hell, they say. And all the other scientists are in and out, and we have meetings in and out. It was like an orphan company. I am amazed that it worked. It worked because Charles and Sir Kenneth Murray from Edinburgh did the interferon and the hepatitis rather quickly. And then we had to wait. We could have closed the company for five years, until the royalties came up and we didn't have to spend all that money all these years. Ultimately, it is really management that can make or break the company.

Hughes:

Were you more intimately connected with Cetus than any of the other companies?

Alafi:

I was there every day.

Hughes:

But were you at Amgen and Biogen on a daily basis?

Alafi:

Oh, with Biogen we had board meetings practically every month, every other month. I was going to Europe in the beginning at least once a month and spending a week. And sometimes I would go and stay two weeks. Intimately, is not like Cetus. I was there; I knew the scientists; I knew Charles. When Schering had problems with them, I knew Schering. They said, "Fly with us," to convince Charles to deal with them. People somehow used to listen. But did I have any power to change things? I didn't, because there was a board, and there was a scientific board. Then we got Rob Cawthorn, the first president, who was a head of sales or something for Pfizer in Europe. He's a meticulous gentleman. But he didn't know a goddamn thing about that industry. I told you once I stayed in Geneva. He was on vacation for a month. I made pages and pages of what is being done, and how should it be done. And then he came, he gave me half an hour and looked at it and said, "Oh, I know all of that." Then Gilbert came later, and said Cawthorn wants him out, so he kicked him out. And Gilbert ran it, and he ran it like a graduate school. And that's when we got Vincent. The whole biotech was an experiment—nobody knew its potential.

[tape interruption]

Hughes:

Applied Biosystems, which was founded in 1981, is on the list of companies you founded.

[tape interruption]

Alafi:

That's before I had the partnership with Monsanto. So it was my investment, not the partnership. As I was telling you, theoretically or in fact, Applied Biosystems was going to be part of Amgen. Then it was dropped because the scientists were not instrumentation people. Someone, whether Lee Hood or the investors, said, "How about the sequencer?" Then we said, "We'll start a company." And that was when we started Applied Biosystems. The whole idea was new.

Tommy Davis was a venture capitalist. I knew him very well. We were going to raise either three million or five million for Applied Biosystems, and we got most of the money. At the very end, he said, "Just a minute. I want to invest." And you have to let him, he's the dean of venture capital. He called me. He said, "Moshe, this thing, this machine, what does it do? Is it something worthwhile?" At that time, we hired Sam Eleter from HP [Hewlett-Packard]. He was making sixty thousand or something. And I think we gave him—I can't recall—a month or two months or eighty thousand dollars and said make a report and tell us how many of these sequencers of Lee Hood could we sell. After a month, two months, he came with a study. I wish I had that piece of paper; I still remember it, handwritten. And in the fifth year, we would sell ninety sequencers. So that's how much we knew, how much anybody knew. We said, "It can't be; there are more than ninety labs." Also if this doesn't happen, Lee Hood has more ideas. So we started the company anyway.

Hughes:

You're talking of course about an automatic sequencer. Did any other company have such a product?

Alafi:

Yes. We started a company in Berkeley called Chromatronics. Liquid chromatography, yes?

Hughes:

It's here on your CV: Chromatronics, Incorporated, Berkeley, California. 1968.

Alafi:

One guy from Berkeley, hippie, his name is Gundelfinger. He had all the hippies in Berkeley work for him. And Pitch Johnson became an investor too. That company grew very well and even HP was using them. Then there was an Australian scientist who has developed this sequencer. And we built one. And we put it in a show. When did Chromatronics start—in '68? So it must have been in the seventies sometime. And I think Beckman also had something there in the show. And then it was going to be in the hundreds of thousands. And I still remember Chromatronics on Fourth Street, Berkeley. The CEO said, "I don't need to get into the cost of instrument wars. I don't want to do it." Another scientist later was suing or saying Lee Hood copied it from him. So that's as much as I know.

[Begin tape 8]

Hughes:

Tell me about Qiagen, another company you founded.

Alafi:

I said I would meet with one of Charles Weissmann's postdocs. I met him and another guy [Metin Coltan? and Karstem Henco?] at the airport in Frankfurt. I was so impressed with them. I said to myself, even if the concept didn't work, these scientists are smart enough to know how to change direction. And they raised the money, and they almost lost all the money. They were able to raise a little bit more from the insiders. But the banks are tough in Germany; they don't give you money. When they wanted to raise more money, the board—I wasn't on the board—had them go to the bank, and put their homes as collateral before they would give them money. No scientists in the U.S. will ever accept that. But ultimately, they really developed something substantial. Enter any lab, you see Qiagen products for DNA purification.

[tape interruption]

They were two young people; they had never run a company. I would start anything with them. That's how good they were without being from a business school like Harvard or Stanford.

Hughes:

Oxford GlycoSciences?

Alafi:

Monsanto was interested because they were funding Raymond Dwerk, who was in glycobiology at Oxford. Through his technology, Howard Schneiderman said, "Why don't you start a company with Oxford technology?" I went and started a company with a British venture capital firm. Over the years, they built sequencers for sugar, carbohydrates. But it never took off. Then they changed and went into developing drugs, and Kirk Raab from Genentech took over as CEO. They thought it could be just as big in supporting sequencing. It didn't materialize. Then they changed direction, and now, I think, they are into a couple of drugs. And, as you read, they are in the process of being merged.

My idea was to start different companies all over, and ultimately they can help each other. It didn't work out that way.

Hughes:

Never?

Alafi:

It's different countries, different cultures. I thought it would be like a symbiotic relationship, but it's not easy.

Hughes:

Stereotaxis?

Alafi:

That's the one company where Chris is on the board. It's in St. Louis. It was started as a seed investment by a venture firm called Sanderling. We had money in that firm too, as investors. They started with a small amount of money in developing the concept and the technology in their firm in Sand Hill Road. They spent the first amount of money—I don't remember—in maybe a year. Then they wanted to start a real company, and then we came into it. And now, I'll tell you

what it is. If you think of an MRI machine: you lie down in it, this has magnet all around you, and then they use a catheter, controlled from a computer that has a magnetic tip. So before, the physician had to wear a thirty-pound lead apron. The patients have limited space to be radiated. After a certain age they have to stop. Well, using the Stereotaxis machine, the physician can sit in New York and control it and go within a fraction of a millimeter anywhere, in the brain, in the heart, et cetera. They are selling twenty of them this year at a million each. Forty next year. And Siemens, who just put a lot of money in it, and now Phillips and G.E. are hovering around; they want to be part of the deal. And I am sure the company will be worth a billion in two years. Everybody--cardiologists, a lot of hospitals--are beginning to want it. That's what's exciting: You go to these meetings, and they have developed something else, something more exciting. It's the best movie house in the world. And they make money too on the side.

Hughes:

Would you like to talk about disasters?

Alafi:

Yes. The one that was in competition with Intel. It was called Qualydine. Invitron—that would have been a major one—is a failure. We started a small company, we really didn't know much about it, it was in the laser, some small shop in Arizona. We didn't know much about the technology nor the people. Through some people, we invested. It was not intelligently invested--not the right people, not the right company. That's another one. [pause] There were a number of those companies that really never got off the ground. We started them, we put money in them, and it wasn't worth it to really go any further, so we stopped them. But not too many.

As I was telling you, we have money in different funds. They invest. Over these funds, we invest in fifty companies. So ultimately, they either sell these companies or go public. Then we get stock from those companies. So we have to worry and watch these companies too.

Hughes:

It sounds like a lot for two people.

Alafi:

A lot, yes. But when we put money in some venture funds we know, we have faith in them. We concentrate on the ones we have major, major investments in. And the others, there are people who are on the board too. The Indians sometimes have eleven, twelve, fifteen children. The reason is some of them die, and they need the rest to survive.

Hughes:

So you translate that into business strategy?

Alafi:

No, but each time, you think that this is a healthy company. And most of them are.

Hughes:

Well, I think we're coming to the end. Do you want to make some general observations? You started on this track well before there was an organized venture capital industry. How much do you think your approach has been modified, if at all, by the new way of investing?

Alafi:

[pause] First of all, we didn't know what we were trying to do. I showed you this [wall chart chronology]. Pitch Johnson was trying to make a living. But then it developed into, it's exciting to see these new technologies and to start companies. It wasn't expensive at the beginning. And to think one day you'll make more than your salary. But we never thought, nobody ever thought at that time, of companies worth tens or hundreds of millions. No, that's insanity. We didn't come to investing with the idea of big firms, organizations—you put this much money in, rate of return, and this is how you do it. It was really over time, from the hip pocket. It was my thing, and the same thing with Gene Kleiner in the beginning: it was bet on a horse, bet on technology, that we felt worthwhile. But you have to work at it, the people have to work at it, and grow it, and ultimately you make a living. Then slowly, slowly, technology started having more and more premiums. The premium used to be gotten by the pharmaceutical companies. Now it's a new field; small people can do things.

The other thing is how venture capital changed. I'll give you an example. I already had started maybe twenty, thirty companies. Then I had a group in the East Coast, they started a fund here in Palo Alto, and they sent a young guy to start companies. One day I took some guy with me; I was interested in starting a company with him. The guy at the investment firm started asking me where was I born, where was I raised, and what my education was in relation to this guy. I said, "You are not going to invest in me. This is the guy, talk to him about his idea." But he had a book, how to negotiate? I didn't care! I invested in somebody from China, you know?

Venture capital has become institutionalized. They have meetings, five of them or ten of them sit every Monday and all of them, I think, have to approve an investment. So it becomes maybe more sure, but still there are failures. They could say, "I didn't do it myself; you all did it with me." Yes? Venture capital became bigger, the money is bigger. It became you really have to think when you go public, how much, how are you going— Well, I never thought of any of these things when I started Cetus or this one or that one. I just thought, It's exciting; it will work. So, there aren't too many who deal anywhere the way we used to do. I really come from a different culture. I still think the same way. The word is gambling, whether you believe it or not. You could study at Harvard; you could study it anywhere. If the professors really knew, each one of them would become a billionaire, and the billionaires are not from there [the universities]. If they are from there, they were the accountants who cheated, from Harvard and Stanford.

Hughes:

[laughs]

Alafi:

So, it is not as easy today. I cannot go today, for example, even with my friends. They will bet if I want to invest in something, like with these Muslims. And now they put in seven and a half million. But they went back and forth, and due diligence and attorneys and consultants and neurologists and everything! These Muslims said, "My God, you just gave us the money, and these guys are driving us crazy!" And they interviewed them back and forth and gave me different projections. I am glad they are there now, because it's going to be bigger. Let them worry. So that's how it's done. You could do all of that, and it could be a disaster.

Hughes:

So, when you want to co-invest with one of these venture capital firms, can you, Moshe Alafi, say, “Well, look at my track record. I don’t have to do things the way you do. Just look at what I’ve done.”

Alafi:

If I bring somebody with me, some new company?

Hughes:

Yes.

Alafi:

They will investigate it. I just put a lot of money in a new company, and now it needs more money. So they go investigate it for months before they decide to put in money.

Hughes:

I was thinking of your own credibility. They still won’t accept the fact that you have been very successful?

Alafi:

No, they do accept it. They do accept it, and they say, “God, if you are interested, we’ll do everything.” But they are a firm of ten; they have to convince the ten. And each one of those ten, of course, they have in the back of their minds, “Listen, I put in all of that money. It must be good.” Then they have to find out where is the hole? Otherwise, if they just say yes, they don’t need all the ten. And they all have to have a function.

No, it works. Usually, I don’t know what—50 percent, 60 percent—if I invested and got a company to a certain point and said, “I would like us to invest together,” it carries a lot of weight. They would look at it. But they don’t close their eyes and invest. They shouldn’t.

Hughes:

Yes, but I still suspect that when Moshe Alafi comes to them, it’s a little bit different than just anybody.

Alafi:

Oh, yes. If I want to raise money now and invest other people’s money, yes? I am sure with my record, if I want to raise a few hundred million, I think I’ll get it. But I don’t want it! I’m not going to work for others. I don’t want to convince others. I don’t want to bet their money and have them say, “How come you bet this one and not that one?”—I don’t want it.

Interview 5: July 10, 2003

[Begin tape 9]

Alafi:

Besides the details that we went through, I started thinking as to whoever is reading this, maybe they would like to know what's the overall take-home lesson. Also, there were a lot of newspaper reports that really were not true.

Stan [Cohen] kept saying to me, "Moshe, you are the one who started the whole thing. It was Cetus really." And Stan and Cohen and Lederberg and Djerassi. Although Cetus did not start as a "biotech"; it was the technology of Don Glaser that really never worked. But subsequently it was Cetus that was the first one that got into biotechnology. Swanson, I think I mentioned, was being kicked out by Kleiner Perkins. He came for a job, and Cape and Farley were scared of him. Swanson knew what the content of the Cetus writeup was, because Kleiner Perkins was an investor. Yes? So because they wouldn't hire him, he went to Boyer, and then when he got the money from Kleiner Perkins, that was the start of Genentech. I got Longman to negotiate the first agreement, for insulin, with Lilly. So the biotech startup was really Cetus.

But then what subsequently became Biogen came into the picture. Swanson came to Biogen after he started Genentech, because he had some agreement with Inco, who were investors in Genentech, yes? And then Inco also invested in Biogen. Swanson flew to London, saying to Biogen not to work on interferon and not to work on different things. It was at a Holiday Inn close to the London Airport, and they just kept him waiting, and he gave a speech, "You shouldn't be working on interferon." But he knew at that time that Charles Weissmann was working on it. This is relevant because subsequently there were suits between Schering and Genentech and Hoffmann-La Roche. And in that suit, the German, what's his name, who worked for Genentech?

Hughes:

Ullrich?

Alafi:

No.

Hughes:

Seeburg.

Alafi:

Seeburg. I saw it myself: he copied what Charles Weissmann either reported or a report, and was copying the information about interferon. He'd admitted it, you know. So that's one. I'm trying to say the history of Genentech. They stole really growth hormone from the university, and they had to pay two hundred million.

Hughes:

It was Seeburg. But Goeddel also is--

Alafi:

The guy I'm quoting was Goeddel in the courts. He's the one who saw the report and copied it. Seeburg is the one that testified against them ultimately and got money.

But then there was another company we invested in heavily. I don't know if I talked about it. That's Tanox, where Nancy Chang in Houston--

Hughes:

I don't think you talked about this case.

Alafi:

I'll tell you the story. She and her husband are from Taiwan. They went through Harvard Medical School. A friend of mine, Goldberg, on the board of Biogen and professor at Harvard, told me this couple, Nancy Chang and her husband, went to Centocor, and then ultimately started a company in Houston called Tanox. Okay? I visited Tanox and put two million from Alafi Capital, and two million personally, in Tanox. The husband developed the anti-I.G for asthma, which was approved recently. They were working on it since then. I had somebody from Alafi Capital on the board of Tanox. She made a presentation to Genentech under confidentiality, and they said, "We are not interested." A few months later, Genentech started working on it, and they started publishing. She came and said they stole it. I didn't believe her, I thought she was insane. And then she immediately started a suit against Genentech. I thought she was more insane, to fight with them. Ultimately she won it. They admitted they stole it. And she got payments, and she got agreements from Genentech and Novartis that she gets 10 percent royalty, whether Genentech develops it or her. So both started developing the drug. Genentech and Novartis, because Novartis was an investor in her company, whichever molecule works best, she still gets 10 percent. And now she went public, and we had about two million shares. I still have a million shares. It's about twenty dollars even now. The history of Genentech was really dirty, and some of the board knew it.

Hughes:

The Genentech board?

Alafi:

Swanson.

The other key thing is, nobody at that time really knew what the magnitude of that recombinant DNA technology is, what will it do.

Hughes:

Do you include Stan Cohen?

Alafi:

No. I think Stan and Lederberg knew that this is a major revolution. The fact is, it's nonstop, the technology and the development. We started a company with Stan in the last two years, and he's so excited about it.

Hughes:

What is the name of his company?

Alafi:

F.G.I. Functional Genetics, Inc. It's in Maryland. I am trying to say it is nonstop, this technology. But I don't think anybody thought, maybe the scientists, it was going to be that big.

Hughes:

Going back to Cetus, I think you are providing examples that show that Cetus has a claim to being the first biotech company.

Alafi:

They are really. But they didn't hold onto it.

Hughes:

If you define biotechnology in the wider sense of using living organisms to produce commercial products, then you can even include Glaser's microbial screening device, right?

Alafi:

Why? It's a different game. I am trying to think why Don's machine, which was using petri dishes, and ultraviolet or chemical things to produce mutations, would be considered biotech. Now, what he was doing, what we were doing, was imitating nature, in a sense.

Hughes:

You were speeding up nature, right?

Alafi:

Correct. And trying to pick the microorganism that would work. Playing with the genes and the chromosomes is a separate thing. Otherwise Don Glaser would be the one who should get the Nobel Prize in that field. But he didn't.

Hughes:

But if you define biotechnology in a narrower way as genetic manipulation at the molecular level—recombinant DNA, monoclonal antibodies—then I think Cetus' claim to being the first biotech company might be a bit more dubious. As you said, Cape and Farley rejected Swanson when he went to them.

Alafi:

Yes, but they had already started out with Stan's technology.

Hughes:

Had they?

Alafi:

Confirm that with Stan. I am sure they did. Stan would know exactly the dates. Kleiner Perkins were investors in Cetus. Swanson saw what we were doing, and he went to Boyer and said, "I will show you what we could do." Perkins came and said to Farley and Cape, "Look what we are doing at Genentech, and how come you at Cetus are not showing results?" Confirm that with Stan. They already were doing projects using recombinant DNA, only they were looking for nothing less than a hundred or five hundred million dollar project. That's a key point.

Hughes:

My memory is that Stan became a consultant of Cetus in 1975. And Genentech wasn't even founded until 1976. So the question is, what was Stan doing as consultant? Was he able to persuade Farley and Cape to actually begin to apply recombinant DNA technology?

Alafi:

Now, I'll tell you, but you have to fill in the dates, and Stan has to fill in the dates. Stan and Lederberg came at some point when Cape was in Hawaii and said, "This is the new technology [recombinant DNA], and I know ours isn't working, and that's what you should do."

Hughes:

You were there?

Alafi:

I was there. I was chairman, and I said to Lederberg and everybody, "Okay, we will start in that field." Yes?

Hughes:

Can you remember when that was?

Alafi:

Stan should remember. Cape came back from Hawaii, and said, "What is this? We have agreements in other fields, we have all of that." And I think he didn't realize what he was doing. But once he started looking into it [recombinant DNA], then he jumped on board. He knew how to do these things. So, I am pretty sure, because both Stan and Lederberg said that's what we [Cetus] should be doing.

Hughes:

Stan, as you know, never throws anything away. [laughs]

Alafi:

Yes, I understand.

Hughes:

Does the name David Gelfand name mean anything to you?

Alafi:

Oh, yes. He was there at Cetus before I left, and he came from UCSF.

Hughes:

My understanding is that he was brought to Cetus specifically to do recombinant DNA.

Alafi:

He brought something, you are right. But I don't know what he brought. And that's prior to Stan?

Hughes:

No. It's after.

Alafi:

They hired him because he had the certain technology.

Hughes:

The questions are when did Gelfand come? And were there scientists at Cetus using recombinant DNA before Gelfand came? We need Stan Cohen to clear this up. But it's a big point, because Genentech claims to be the first biotech company.

Alafi:

It's not true! Stan knows exactly when Boyer did what. And that is key. My memory is bad.

Hughes:

Do you have more on your mind that you wanted to clear up?

Alafi:

Not really. I will let ideas come, but go ahead.

Hughes:

I have some general questions related to venture capital. Did you have a rule of thumb about how actively you would become involved in managing a company?

Alafi:

Personally?

Hughes:

Personally, yes. Doing more than just appearing at a board meeting.

Alafi:

Yes. I did run a company before.

Hughes:

Oh, I know you did. I mean in terms of investment.

Alafi:

Yes. I was at Cetus. I had a room there. I was involved in all the decisions, all the time, until I left. Not running the company, but discussing strategies, what agreements. We went with them [Cape and Farley] when we negotiated agreements with Schering. I was at all of these things because it was fascinating to me, the whole process. And I knew more than they did, because they never ran a company. So with Cetus, yes, I was actively involved in running the company.

Hughes:

Was it mainly Cape and Farley that you were interacting with?

Alafi:

Yes, and Don came every now and then.

Hughes:

Right.

Alafi:

With Biogen, it was different. It had its own management, and I was on the board. But I was involved a lot in the beginning. You have one of Weissmann's articles. He feels I saved it. They saved it really. I didn't save it. So, I was involved in the beginning with the presidents and negotiations. I was in the negotiations when we made that deal where we got 15 percent of sale on interferon. You know, that made seventy-five, a hundred million a year. I was there and Kevin Landry from T.A. So that's how we got involved more and more. And then once the structure and the president were established, it became just board meetings.

Hughes:

It was harder to be involved in Biogen, wasn't it, because where was Biogen? In the early days, it was really a collection of academic laboratories that had agreed to do some commercial work. Am I right?

Alafi:

That's right, but we also quickly started a company in Geneva, where they hired people and started working there. So it's a combination. Charles did interferon in his lab in Zurich at the university. Ken Murray must have done it in Edinburgh, yes? But the company also had labs and was working on projects also in there. How much interferon was worked in Charles' lab versus in—. With Charles, he controlled everything in his own lab. The others, there was some research in the university labs, some had to be done in Biogen. Then it changed when we got in Boston. We had a president. And then Wally Gilbert took over after Cawthorn. And even though that same arrangement persisted, there became more and more research in the company.

You are right, Biogen was different. And that's maybe how Genentech beat Biogen, because it was all in one place, concentrated in business. It fits into their lab project, their own project, and it is in their life and death, although it was in a sense, who can beat the others first.

Hughes:

And perhaps too, it made a difference that the scientists at Biogen were senior people, senior scientists. And you talked about their egos, you know, particularly Gilbert. Weissmann I'm sure has an ego, and rightfully so. The scientists at Genentech, in general, were very young people.

Alafi:

That made a lot of difference.

Hughes:

Yes, I think so.

Alafi:

Yes, and it created a problem for the young people who were working in Biogen, because they had the competition of their seniors also working in their lab. But also it was not healthy. I remember Charles Weissmann was working on beta-interferon and so was Walter Fiers. And they would come and would not divulge what they were doing in their labs.

Hughes:

To each other?

Alafi:

Yes.

Hughes:

[laughs] In the same company!

Alafi:

Geneva and Cambridge were working on erythropoietin. And they were competing. And in spite of that, the concept worked.

Hughes:

Yes, isn't that amazing? So quite a different history, isn't it?

Alafi:

Oh, yes.

Hughes:

Do you think that if there hadn't been the geographic distance, you would have wanted to become more involved with Biogen, in the way you had on a day-to-day basis with Cetus?

Alafi:

No, because I felt two things. It really needed more professional management to understand the pharmaceutical industry. I have some common sense, but it's a technology that even though I was a physiologist I couldn't really feel comfortable enough with. No, I felt it needed better people.

Hughes:

Who was there at Biogen in those early days who knew how to run a company, who knew the pharmaceutical industry, who knew how to take something from the bench to a product?

Alafi:

First, we had Adams who is an attorney from Inco. He ran it while he was running all over. Once we found a place in Geneva, we hired Rob Cawthorn from Pfizer. But we didn't understand at that time his British small-talking; he was given twenty more IQ points because he spoke with a British accent. [laughter] But he was in marketing; he really didn't understand the research people. I remember he was on vacation once. I spent a month in Geneva looking at how they were doing things and wrote pages and pages. Rob came, and I said, "I have to see you, if you have half an hour," and he looked at all those three hundred pages, and he said, "I know all of that." And then he left for Greece. Yes? Subsequently Gilbert said he will run the company. But we made another mistake. On the one hand, we say, "Gilbert is a Nobel Prize winner." (Did he get it yet or not?)

Hughes:

He got the Nobel in 1980.

Alafi:

We thought he knows how to run a lab, so let him run Biogen. That means we are in a phase of science development. But he ran it like a graduate school. And that was a disaster. Then we had an interim president, and then we got--

Hughes:

Vincent?

Alafi:

Vincent. We interviewed him in Boston. It was so clear that he knows what to do.

Hughes:

I think it was you that also made the very good point about Genentech. The contract they made with Eli Lilly on insulin avoided these problems in that--

Alafi:

I introduced him to my good friend, the ex-chairman of Schering-Plough, with the idea I was going to invest in Genentech. But after I did all of that, Swanson said, "You can just invest a hundred thousand, and you can't do anything with Biogen." I said, "Drop dead." [laughter] I gave him Longman, and Longman is the one who negotiated that for him. He was ex-chairman of Schering-Plough. I had him on the board of Cetus. And then I loaned him for Swanson, and he helped him negotiate that contract.

Hughes:

What criteria do you use to decide when a company is ready to go public?

Alafi:

The world's changed. Today is different from those days. I'll give you an example of Cetus. We didn't know how much money we had to raise for different branches. All we knew was how much we needed money for another year or two, and then we said we had to sell the minimum amount of stock. We made an evaluation, what's the minimum we could sell to raise money. Nobody knew how long it takes, and how much money is involved in that whole technology—nobody.

When the whole technology came to pharmaceuticals from the agreements we made at Cetus, they were scared to death. They were afraid, what if a small lab finds insulin or something, and goes to their competitor. So they were jumping to make deals. With the requirement to jump to make deals, so this company [Cetus] had to grow and make more money, Wall Street got excited. So Wall Street started taking whatever comes there to raise money. And Cetus raised a hundred-million-plus, and I don't think Wall Street knew what the hell they were doing. And Genentech raised I don't know what, and the stock went to eighty-nine—I don't remember. Nobody knew, neither Swanson nor Wall Street. This is the new thing; it's going to cure all diseases, and you better put money in it.

What happened subsequently, pharmaceutical companies got smart: they could do it [recombinant DNA] too. They would not jump and pay through the teeth for the technology; they could make payments. Wall Street got smart: this can't take hundreds of millions any more, yes? More and more companies started coming public, and the need for a lot of money became

obvious; it wasn't obvious in the beginning. So the requirement to go public, the venture group were willing to put money. And the venture group also had a time limit. They can't wait eight years for the product to come. So there was this hype, deliberate or not deliberate, and the public was dying to get into this thing. So the public market became available because of all of these forces.

But today, it's much different, in spite of the bubble. Today, the investors got smart. They say, I am putting money in, a hundred dollars today. How much more money are you going to need to develop a product? And how much more are you going to raise, and how much am I going to be diluted? And show me. When we started Biogen, Amgen, nobody asked, "How long does it take? Which have we missed? We didn't know it's five hundred million to develop things." Now they know the answers.

Hughes:

Did you know?

Alafi:

Nobody knew—nobody. We did not have pharmaceutical people.

Hughes:

If you had known, do you think you--

Alafi:

We would have been scared and would not have started a company.

Hughes:

Has your approach to investing been influenced in any way by the fact that the venture capital industry today has a more due-diligence approach to its investments?

Alafi:

Did I change anything?

Hughes:

Yes.

Alafi:

No, I'm still the same. I invested in a company I started with Stan because I know him. He told me what he wants to do, and he couldn't get funded anywhere. And I thought, it's worth a bet. We started a company with two Muslims from Bosnia, and I knew they're smart. I'm the only one who put money in them. And now after they developed products, three, four major venture capital firms are putting money into them. But I didn't put in more than two, three days with them and decided to start it. The new investors put in due diligence before they decide to put money. I know them all. I even have investments in some of those funds. They are safer, but I gamble. I gamble most of the time.

Hughes:

Do you still stick by your faith in people?

Alafi:

Until they screw up. Until I see they were not what I thought. Not genuine. Usually, they all prove to be competent. A lot of them, not all of them. I've been fooled a few times. And if they are real competent, you don't have to worry at night.

Hughes:

Do you like the speed of decision-making and the way business moves in the United States?

Alafi:

Yes, because that's how you beat the big companies. A big company, to really make a decision to go into a certain area, they have to have reports and reports and reports, and all of that. In a small biotech company, it's really made by two, three, four people. You might not make it, but that's what you have, flexibility. And your life depends on it.

Hughes:

How does the Middle East and its attitude toward doing business fit into the picture that you're drawing?

Alafi:

First of all, I come from a place where the thief of Baghdad came from. [laughter] Ali Baba and the forty thieves. My father was in commerce. The way they made deals is you sit and bargain. They'd sell you a hundred thousand yards for a dollar, and they'd shake hands and that's it. There is no written agreement; there is nothing. And when the material comes, they deliver.

Hughes:

What about their attitude towards risk?

Alafi:

There was no risk in terms of big companies there. There aren't companies. Then comes the other aspect. Since they are penniless, they are bigger gamblers, and they have a saying, "A penniless man is safe in a caravan." So you could gamble. I think they are bigger gamblers, coming from there—big numbers. The Indians in London, or the Iraqis all over the world, they can gamble because all they need is to eat. So they have that spirit, a lot of it. And I think the Americans have it.

I was educated in a French school in Baghdad. As Jews we were told, "No money, no land, nothing helps you." We have been persecuted for thousands of years and kicked out from one country to another. I still remember when I was in school. The only thing that's important to our mothers is what you have in your head. That's what you are going to have with you. That's why I never was worried about anything. I came to New York. I didn't care; I just was curious. These buildings are high; it's going to take a long time to get up there. [laughs]

Hughes:

[laughs] This idea that it's what's in your head that counts came through your education and through your family?

Alafi:

It is a Jewish thing; I think it's all over the world. That's why I think Jews are motivated. It's like the Chinese. They really believe that's their survival.

Hughes:

Okay, last question.

Alafi:

Oh, wait, I want to say one more thing. To be married to the right people is very important.

[tape interruption]

My wife Ginger enjoyed that game. She's from Berkeley. It's fun, you know? So I never worried whether she wants to live in a big house. It was just a game.

Hughes:

Yes. So often when I talk to people, seldom do the circumstances of their personal lives come into their discussion of their careers. And yet, the impact in every case, I would suggest, is going to be positive or negative in a net way. It is important, I think, how supportive or not your spouse is.

Alafi:

Oh, I agree. It's a game. It's useless to have all of those stocks and shares in the bank. Give it away! And that's what she likes to do.

Hughes:

[laughs] The last question is, what do you think that the U.S. government and perhaps the business community here need to do to maintain this country's entrepreneurial edge?

Alafi:

We have dinner with Charlie Townes in Chinatown. We were talking about China, one hundred thirty billion Chinese. They are highly motivated. They are cheap. They can get money from the world. They can get technology. What's going to save the world?

[tape interruption]

The Americans know how to innovate. And the government spends a tremendous amount on research, whether to the NIH or to our military. This is where a lot of the technologies came from. The survival of the West will come from innovation. Not cheap labor, not money, because China can get money from any bank. Technology, they can get it. They are producing everything. So it's constant innovation. I almost wondered, because in a few years, they will produce Mercedes better than they can produce them in Germany, at maybe one tenth of the cost.

Hughes:

Why do you keep doing this?

Alafi:

Because I think it's the most exciting game. I'm not doing it for money. Therefore I can make better decisions. To bet on what's exciting can be really fun and useful for the world. I feel good about Biogen, Amgen, all of that. I have created a lot of jobs. I don't think of this every day. When I decide to invest, Chris and I see the people. I am glad he's excited he's doing it. It's fun. I don't play golf, and even if I did, that's boring.

Hughes:

[laughs]

Alafi:

This is something I could do in my sleep; I could do if I'm traveling in Tahiti. I have friends now in science all over the world; it's fun to hear everything. I could do it ten times even bigger, but I'm not interested to. I do not want to kill myself; I want to do it nicely. So, I still do it. I'll do it until it's not fun anymore.

Hughes:

Is there anything else you wish to say?

Alafi:

No, thank you for taking the time.

Hughes:

Well, my pleasure.

[End of Interview]