SCIENCE HISTORY INSTITUTE

FRANKLIN PASS

Life Sciences Foundation

Transcript of a Research Interview
Conducted by

Mark Jones

in

Minneapolis, Minnesota

on

11 November 2012

(With Subsequent Corrections and Additions)

CHEMICAL HERITAGE FOUNDATION
Center for Oral History
FINAL RELEASE FORM

This document contains my understanding and agreement with the Chemical Heritage Foundation with respect to my participation in the audio- and/or video-recorded interview conducted by Mark Jones on November 12, 2012.

1. The recordings, transcripts, photographs, research materials, and memorabilia (collectively called the "Work") will be maintained by the Chemical Heritage Foundation and made available in accordance with general policies for research and other scholarly purposes.

2. I hereby grant, assign, and transfer to the Chemical Heritage Foundation all right, title, and interest in the Work, including the literary rights and the copyright, except that I shall retain the right to copy, use, and publish the Work in part or in full until my death.

3. The manuscript may be read and the recording(s) heard/viewed by scholars approved by the Chemical Heritage Foundation unless restrictions are placed on the transcript as listed below.

This constitutes my entire and complete understanding.

Signed release form is on file at the Science History Institute

(Signature) _____

(Date) 08/01/2017 Franklin Pass

OPTIONAL: I wish to place the following restrictions on the use of this interview:

N/A

I understand that regardless of any restrictions that may be placed on the transcript of the interview, the Chemical Heritage Foundation retains the rights to all materials generated about my oral history interview and will make the title page, abstract, table of contents, chronology, index, et cetera (collectively called the "Front Matter and Index") available on the Chemical Heritage Foundation's website. Should the Chemical Heritage Foundation wish to post to the Internet the content of the oral history interview, that is, direct quotations, audio clips, video clips, or other material from the oral history recordings or the transcription of the recordings, the Chemical Heritage Foundation will be bound by the restrictions for use placed on the Work as detailed above. Should the Chemical Heritage Foundation wish to post to the Internet the entire oral history interview during my lifetime, I will have the opportunity to permit or deny this posting.

I understand that the Chemical Heritage Foundation will enforce my wishes until the time of my death, when any restrictions will be removed.

This research interview is designated **Free Access**.

Science History Institute

Chemistry • Engineering • Life Sciences

INTERVIEWEE

Franklin Pass was born in Duluth, Minnesota. His father, a lawyer, died when Pass was twelve years old, after which his family moved to Minneapolis. He attended the University of Minnesota and graduated from medical school in 1961. While studying, Pass gravitated toward dermatology. After moving to Los Angeles, California, to work at a county hospital, Pass did a dermatology residency at Oregon Health and Science University. While in Oregon, Pass was drafted into the military. He did his basic training in Baltimore, Maryland, before being reassigned to Denver, Colorado and then to Japan. While in the military, Pass decided he wanted to pursue academic medicine. After leaving the military, he began working as a postdoc with Donald M. Marcus in his immunochemistry lab at the Albert Einstein College of Medicine. He initially studied eczema but switched to cancer research after facing difficulty securing grant funding. Pass eventually was awarded a National Institutes of Health grant for wart research, which prompted him to return to Minnesota, moving back to Minneapolis in the summer of 1973. While in Minneapolis, Pass began working with Anthony Faras and Gérard Orth, the latter positing that the viruses that caused warts could also be oncogenic viruses. After examining a patient with both warts and cancer and finding her papilloma virus in her cancer, the group presented their findings at a conference. The group also studied warts and cancer in non-human subjects, such as calves.

In October 1978, Pass, along with Abraham White, founded Molecular Genetics with a plan to create a bovine wart virus vaccine. It took over a year for the company to raise enough money to sustain itself, after which they built a small laboratory and hired personnel. Continuing financial issues led the company to expand beyond bovine vaccines into the corn genetics business, which they did after collaborating with molecular biologists at the University of Minnesota. Corn genetics proved to be a viable field for the company, and they helped develop corn feeding programs in corn-milling industries as well as opening a bioseed company in the Netherlands called Mogen. Pass helped grow Molecular Genetics to thirty-four PhD scientists and ninety lab workers before he was let go from the company in November 1986. Molecular Genetics would later become MGI Pharma Inc. and was purchased by Esai for 3.6 billion USD. Pass concludes his interview by talking about his current work and connections to California.

INTERVIEWER

Mark Jones holds a PhD in history, philosophy, and social studies of science from the University of California, San Diego. He is the former director of research at the Life Sciences Foundation and executive editor of LSF Magazine. He has served in numerous academic posts, and is completing the definitive account of the origins of the biotechnology industry, entitled *Translating Life*, for Harvard University Press.

ABOUT THIS TRANSCRIPT

Staff of the Life Sciences Foundation conducted this interview, which became a part of our collections upon the merger of the Chemical Heritage Foundation and the Life Sciences Foundation into the Science History Institute in 2018. The Center for Oral History at the Science History Institute edited and formatted this transcript to match our style guide, but, as noted, Science History Institute staff members did not conduct the interview.

The Center for Oral History, Science History Institute, is committed both to preserving the recording of each oral history interview in our collection and to enhancing research use of the interviews by preparing carefully edited transcripts of those recordings. The preparation of interview transcripts begins with the creation of a verbatim typescript of the recording and proceeds through review and editing by staff of the Center; interviewees may also review the typescript and can request additions, deletions, or that sections be sealed for specified periods of time. The Center keeps track of all changes that staff, interviewers, and interviewees make to the original typescript. Please contact us if you would like additional information about these materials. We have established guidelines to help us maintain fidelity to the language and meaning of each recorded interview while making minor editorial adjustments for clarity and readability. The transcript also includes time stamps at five-minute intervals. We omit without noting most instances of verbal crutches and all instances of nonlexical utterances. We also make small grammatical corrections where necessary to communicate interview participants' meaning. Finally, staff of the Center create the abstract, chronology, and table of contents. With the availability of online full-text searching of our transcripts, the Center for Oral History opted to discontinue the practice of preparing a back-of-the-book index for each oral history transcript in 2020. **The Science History Institute is committed to the responsible presentation of the history of science by addressing evidence of inequality and oppression as well as the subsequent silences in our collections. To that end, we recognize there may be language in our oral history collection that is outdated, offensive, or harmful, such as, but not limited to, the following: racist, sexist, Eurocentric, ableist, and/or homophobic language or depictions.**

INTERVIEWEE: **Franklin Pass**

INTERVIEWER: **Mark Jones**

LOCATION: **Minneapolis, Minnesota**

DATE: **11 November 2012**

JONES: [. . .] Why don't we start with biographical background?

PASS: I'm a physician. I'm from Minnesota. I was born in Duluth, Minnesota.

JONES: Duluth? Okay.

PASS: So I came down here in junior high school and graduated high school in Minneapolis, [Minnesota]. Went to the University of Minnesota and University of Minnesota Medical School.

JONES: Let me ask you about growing up and your family.

PASS: Oh, my father was a lawyer in Duluth, [Minnesota]. He died young and when he died, that's what actually brought us down into the city.

JONES: So you were a teenager at that time?

PASS: Yeah, I was twelve when he died so we came down here when I was thirteen, when I was in, like, the eighth grade.

JONES: Did that have a big impact on you at that time?

PASS: Is that why I became a doctor?

JONES: Well, no, I . . .

PASS: I have no idea.

JONES: Yeah.

PASS: From those teen years **<T: 20 min>** on, I knew I was going be a physician.

JONES: You did?

PASS: Yeah, when I graduated medical school, I mean high school, I went to work in one of the city hospitals here as an orderly, and I was a pre-med in college and went to medical school. I didn't know that I would necessarily wind up being a dermatologist but I did. When I graduated medical school in 1961—I'm seventy-six now—I went to LA [Los Angeles] County Hospital on a rotating internship, married, and just before I started my internship. When I finished the internship, I went up to the University of Oregon to do my residency in dermatology. So—

JONES: Why did you still like dermatology?

PASS: I don't know. I like to look at things. I do a lot, I was a kind of half-assed artist as a youth and that's sort of my sensibility. I later went on to organize and run a training program in dermatology, so I heard why other people went into dermatology. I was at Albert Einstein [College of Medicine] in the Bronx, [New York], which is a part of Yeshiva University, and the Orthodox Jewish kids didn't want to work on the Sabbath, and they thought that if they were dermatologists, they would be excused.

JONES: Right, yeah.

PASS: That didn't sit well with me. I didn't hire any of them. I went to a program. I thought I would go – by that time I thought I still wanted to live in San Francisco, [California], and I thought I would go to SCAMP [Standard Clinical Assessment and Management Program] or some dermatology residency, and before I left here to graduate medical school, I went to the head of dermatology here. His son was a classmate of mine in medical school so I knew him– [. . .] So, when I went to meet with the chairman of the derm department here in Minnesota, he said, "I'll get you a residency at Stanford [University] if you'll go up to what's now Oregon [Health and] Science [University], and interview up there. There's a new man that just took over, he's just starting the program and I think you'll be impressed."

JONES: And you were envisioning a career in—

PASS: In clinical—

JONES: In research?

PASS: At that time clinical dermatology. I said, "Sure, I want to go to Stanford, but I'll go meet the other guys." I stopped at Stanford first, and the first thing that that guy asked me was, "What's your draft status."

JONES: In 1960—

PASS: It was '62, in '62 there was a draft.

JONES: Yeah, okay. **<T: 25 min>**

PASS: So, I said, "Well, I've applied for deferment for my residency training that was called the Berry Plan, and if I get that, I'll go in the army after I finish my clinical training."

He said, "Well, that sounds pretty upbeat." So I went up to see this guy in Portland, [Oregon], and he said, "I'd like you to come here as a resident. Francis tells me that I should take you and Francis is never wrong."

I said, "Yes, but, Dr. [Walter C.] Lovitz, I don't know what my military status is. I might not ever get here or I might get here and I get drafted."

He put his arm around me and he said, "Look, if you get drafted, you get drafted. When you get out of the army, I'll still be here and you'll come and join me. I don't care about that."

JONES: So that was more inviting?

PASS: [laughter] Considerably. So that was in fact my first entrepreneurial experience because it was a new program. By, oh, by my third year I was the senior resident and worked with the chief closely and started to do a little research in the lab there.

JONES: Was that part of it appealing to you at the time, the fact that it wasn't—

PASS: I didn't realize it, only in retrospect. Now, I get out of the service, I did get the varied plan permit and now I have to go in the army as a dermatologist.

JONES: Afterwards?

PASS: I enabled a research job and that's what I did in Maryland, chemical worker research.

JONES: Oh, okay, that explains your—

PASS: So, I thought I was headed there, and I got there, I did my basic training and I went to just north of Baltimore, [Maryland]. It was in the middle of summer and I developed a taste for blue crabs, steamed crabs. But probably around late October, I got a telegram telling me that I was being reassigned to the Far East and I would report to Fitzsimons in Denver, [Colorado], the first of December. That was a shock. I called the guy–

JONES: When they said Far East, does that mean Vietnam, Southeast Asia?

PASS: I didn't know where I was going. [. . .] It turned out that the war had heated up in October of '65 and they found themselves short of doctors and medical facilities. So what happened is thirty-four physicians and four hundred nurses and corpsmen gathered in Denver for a week of training and then got in four airplanes and flew to Tokyo, [Japan]. I had a feeling that I was going to Japan because I'd been told to take a winter uniform along. There is military hospitals in Okinawa and in the Philippines and so on but they wore summer uniforms all year and that was my first clue—

JONES: The first clue.

PASS: Korea, I could have been going to Korea but that seemed too far.

JONES: Or the Virgin Islands maybe?

PASS: That seemed too far off the beaten path. So we built . . . the commanding officer who was a surgeon, we built a thousand-bed **<T: 30 min>** general hospital very quickly and that was my second entrepreneurial experience.

JONES: You were involved in directing, telling them how to design the hospital?

PASS: No, I was just the doctor, but it was an invigorating experience. I brought my wife and my baby over, had a second baby in Japan. I did some work at the airport hospital as well as my own hospital. Went back to the United States to take my board exams in dermatology and I saw while I was there I had pretty much in my mind by that time decided that I wanted to do something in academic medicine when I got out of the army.

JONES: Why? What led you to that conclusion?

PASS: I had done a little research as a resident and published a paper that I presented at the National Dermatology Society, and I was getting the bug. I talked to one of my teachers who knew the Department of Medicine chairman and Albert Einstein, and Einstein didn't have a full-time dermatologist, didn't have a dermatologist. Dermatology was part of the Department of Medicine, so I went there to interview, and I interviewed at maybe three or four places across the United States. I thought about . . . my wife at the time was from LA and I thought about going to Los Angeles.

JONES: Did she want to go there?

PASS: Yeah, she was happy in Los Angeles, but she had work in New York, [New York]. When we first met, she was working in New York. That was good. He told me, this is a man by the name of Irving [M.] London, who was one of the superstars of American medicine in the sixties, seventies.

JONES: What was his field?

PASS: Hematology. He was a research hematologist at a lab. He named the man Aaron Lerner, who was the head of dermatology at Yale [University], and he said, "I can't get Aaron to come down here." But it was basically a Jewish school and Aaron was Jewish and most of the people who gathered in 1954 to begin it were academics of that faith, as an aside.

He said, "You know Aaron Lerner but I'll tell you what I'll do. I'll get you a fellowship, postdoctorate fellowship, and you'll go into the lab and you'll work in the lab for two years. If we like each other at the end of that time, you'll be my dermatologist." I went into an immunochemistry lab with a physician scientist whose name is Don [Donald M.] Marcus and it was very basic immunochemistry. I had a couple of ideas that were extensions of the work I had done as a resident.

JONES: Tell me about that.

PASS: Well, it had to do with the mechanisms of eczema, the allergic rash that people get, and I thought we could shed some light on that. I did a year's worth of work and it resulted in a good paper, and I applied for an NIH [National Institutes of Health] grant based on that work and I didn't get the grant.[1] My mentor said to me, "You know what? You better start thinking about cancer."

JONES: This is the war on cancer era, right?

PASS: Right, he said . . .

JONES: Yeah, that may be a little bit before it but—

PASS: He said . . . **<T: 35 min>**

JONES: I'm thinking melanoma.

PASS: "I'm going take my work and I'm going reorient it towards issues that allow me to get cancer funding and you better—"

JONES: Wait, is this 1971? Are we that far? Earlier?

PASS: No, it's 1968, early '69.

[1] Franklin Pass and Donald M. Marcus, "Specificity of Rabbit Antibody to Formaldehyde Treated Rabbit Serum Albumin," *Journal of Investigative Dermatology* 54, no. 1 (January 1979): 32-36.

JONES: Yeah, okay, but it's already—

PASS: It's going in that direction. But he was pretty prophetic.

JONES: Yeah, sure. No, that's good advice, right?

PASS: We were in the Ullman Building, that's a totally laboratory building and that's where the molecular biologists were at the time and—

JONES: So this work, you had done this work as a resident?

PASS: I had started thinking about eczema as a resident.

JONES: And you continued that—

PASS: The chemistry of that, for a year.

JONES: What did you find out?

PASS: Well, I scoped out a simple project. I thought that people are allergic to formaldehyde, you might be aware of that. There used to be a lot of formaldehyde in clothing. The wife and I bought some bedsheets yesterday and I was commenting that they no longer smell like formaldehyde. People are allergic to formaldehyde, but formaldehyde is a very, very small molecule—how can you be allergic to that?

What I thought happened is that what formaldehyde did is it changed the shape of a protein in your body, in your skin for instance, and that's what you were actually allergic to, not formaldehyde per se.

JONES: Right.

PASS: I proved that true using serum albumin and rabbits.

JONES: Had anybody ever identified that mechanism before?

PASS: No, nobody gave a shit. [laughter]

JONES: Oh, well . . . [laughter]

PASS: Nobody kind of got it.

JONES: Yeah, so they got you since?

PASS: No.

JONES: No? [laughter]

PASS: I doubt it. I said, "What do you want to do with cancer?"

"Skin."

I said, "Well, here's something interesting, people get warts usually as teenagers or children, and those are tumors of the skin that disappear spontaneously. I think we should . . . they're caused by a virus. I think that we should take a look at that. I'm going to take a look at that."

JONES: This is the era where oncogenes are being discovered, right? The first oncogenes?

PASS: Right, right. Now, but I was in an immunochemistry laboratory, and we thought that the mechanism for the disappearance of those warts was an immunological mechanism, which in fact it is, although I'm not sure that's fully understood yet either. So, I did some very rudimentary experiments. That was the year that a man by the name of Jake Nasal had returned to Einstein from a sabbatical in Cambridge, England, where he had worked in [Aaron] Krug's microscopy laboratory and had the first electron micrographs of wart virus. So, we collaborated; we did some morphologic work, we did some immunologic work, and I applied again for an NIH grant and, lo and behold, I got it. [laughter]

JONES: You said the magic words, right?

PASS: About that time in ’72, my wife and I separated. [. . .] So, we wrote a couple papers then, on sort of the basic morphology and ethnogenicity of the wart virus. I separated from my wife.

JONES: At around that time?

PASS: Yeah, in ’72. I began living with another woman, and my wife and two young children moved to LA and I was feeling a little lonely and isolated. We were talking about getting married and thought that living in Manhattan, [New York], and scrambling to make a living was counterproductive.

JONES: You mean as a physician, scrambling?

PASS: Well, yeah, but I was spending most of my time in the lab.

JONES: Yeah.

PASS: I started a residency training program. I brought in–

JONES: Started administering? Yeah.

PASS: Yeah.

JONES: In dermatology?

PASS: Yeah.

JONES: At Albert Einstein?

PASS: Yeah, I started that training program. I brought in a completely–Irving told me that I could have the dermatology job. I said I need residents. "Start a training program."

I said, "I will but I need a clinical dermatologist as a partner in that because I don't want to do the clinical dermatology anywhere . . ."

JONES: Did he say, "I know a guy at Yale?" [laughter]

PASS: No, I found a resident coming out of Harvard [University] and he joined us, and he just retired two years ago as chief of the program there, which he had headed for years.

JONES: So it became a real institution?

PASS: It did. So, I thought about coming back here. My wife could come here to meet my mother in the summer of '72, and there was a new chief in dermatology at the university and I wound up moving there July of 1973. I just moved my research grant, my equipment, everything.

JONES: And did you say you had gotten married?

PASS: I wasn't married when I moved here. I was married—

JONES: After?

PASS: In August of '73, the second time.

JONES: Yeah, so where was your wife from, your second wife?

PASS: She was from Lorain, Ohio. She was my laboratory technician in New York.

JONES: So, Minnesota is not that . . . Ohio's not that far from Minnesota, that different—

PASS: She considered herself a Midwesterner. That's a stretch.

JONES: And she was used . . . Ohio?

PASS: I guess not.

JONES: Yeah, I think Ohio . . .

PASS: When you look at this election, you sort of think of Ohio, Michigan, and Wisconsin in one breath.

JONES: Yeah.

PASS: Well, you didn't back then.

JONES: No?

PASS: I didn't, not if you were from Minnesota.

JONES: I guess. You're thinking Nebraska, Iowa . . .

PASS: No, there were no Norwegians in Ohio.

JONES: Right.

PASS: We came back here. By that time the wart work was looking interesting. Einstein had a cancer center grant, the first wave of cancer center grants. At least the research part of that, maybe there was only a research part of that, was run by a man whose name was Harry Eagle, of the Eagle's [minimal essential] medium, which is extended—

JONES: It was a family business, or it was him? He developed it?

PASS: No, he was just the developer **<T: 45 min>** of it. He was in active admission, he probably came out of the NIH, I'm not so sure where. There's generational difference—I was maybe in my late thirties and he was in his early sixties. But that was an interesting group of very basic researchers. When the study section people came around to do a site visit, they would trot me out because I was the only person doing anything that had clinical relevance. I was the only physician there to do it.

JONES: Had you made any connection to cancer at that point?

PASS: No, no, I had not. So I . . . they gave me money for postdoc. After he was with me for years, I moved to Minneapolis. He came with me for a second postdoctorate. He was Japanese, he was a Japanese physician. By the time I got there I was somehow or other recognized in the small circle in the world of people interested in the wart virus. After I had been there about a year, I brought in a Frenchman [Gérard Orth], who was my equivalent in France. I had the first, and at that time only, NIH plan for wart virus, which is quite unusual because now there are thousands of them.

JONES: Sure, no.

PASS: So, his name is Gérard Orth. He thought that it was an oncogenic virus.

JONES: Had you thought that before?

PASS: Not really. So, I brought him here to give a lecture and in the backrow of this little amphitheater, a very esteemed amphitheater, there was a heckler in the backrow asking all sorts of scientific questions that Orth, who had trained with [inaudible] at Pasteur Institute but was at a different institute—Gustave Roussy [Institute]—and he couldn't answer those questions. And I thought that this guy in the backrow was [kind of] rude, was very rude –

JONES: But they were great questions?

PASS: Yeah. After Orth left, some guy called me up and I figured out that he was the guy in the backrow, and he said, "I'm a retrovirus virologist, molecular biologist, and I want to get into RNA [ribonucleic acid] viruses. We're going to work together." [laughter]

PASS: I said . . .

JONES: You all felt presumptuous, right? Rude and . . .

PASS: Right. His name was Tony Faras—Anthony Faras—and I said, "You got to be nuts."

He said, "No, come on over to my lab," and by the end of that year, whatever year it was, '74 probably, maybe '75, I had moved all my equipment out of my lab into his lab, and we had a joint papilloma virus group put together. He assigned two of his postdocs, three of his . . . two of his postdocs, to work in papilloma virus.

JONES: Well, what had he been doing in his lab prior to that?

PASS: Retrovirus.

JONES: Oh, right, yeah.

PASS: He had postdoc'd with **<T: 50 min>** [J.] Michael Bishop. Now we have basically one lab. I went off campus to see patients in the afternoon. By that time, I was pretty hungry, had alimony to pay and stuff like that, and so I went to the university in the morning and over to a suburban practice very close to your hotel in the afternoon. And that was my life for a few years. Now, very early on after Gérard had left town, I saw a woman in the clinic that had both warts and cancer on her perineum between her vagina and her anus, and it dawned on me that Orth was probably right. We started studying them. That was at the moment they were beginning to type papilloma viruses, to realize that all papilloma viruses weren't born equal.

JONES: How many are there?

PASS: Now? I have no idea.

JONES: Did it multiply?

PASS: Back in those days there were maybe a dozen. And lo and behold, we found her type of papilloma virus in her cancer and—

JONES: Was that the first connection that was made?

PASS: Yes.

JONES: And that was a big deal, right?

PASS: Pardon?

JONES: And that was a . . . people recognized that as a big deal?

PASS: No.

JONES: No? They have since. [laughter]

PASS: By that time there was a third academician involved, his name was Harald zur Hausen.

JONES: In Minnesota?

PASS: No, in Germany.

JONES: Oh, okay.

PASS: Maybe Heidelberg, [Germany]. Harald two years ago got the Nobel Prize for that discovery. When we met Harald, we thought that cervical cancer was caused by herpes virus.

JONES: There could be a connection there? Is there not?

PASS: Not, it's caused by papilloma virus.

JONES: Also could there be other viral . . .

PASS: There could, I don't think there is, but I don't know; I haven't kept up with the field at all in years. This was a long time ago.

JONES: But that's interesting, so how did

PASS: Well, I made a mistake—I'm a lot wiser at this age than I was in my early forties, and I went to a meeting—I had a paper in press or submitted which I thought would be published on two subjects that were varied breakthroughs in the wart scene. I presented them at a dermatologic, scientific meeting in Kyoto, [Japan], in 1982. Harald wasn't there; Harald's a perfectly nice man but he wasn't there. But one of his disciples was there, a man from his lab, and they got up in discussion and said that what I had said wasn't correct.

They had looked at twenty-five cancers in the vagina, cervix, perineum, anus, and hadn't found wart virus in any one of them. Well, they were using the wrong probe, wrong viral type, and they missed it. But not for long in fact. Then I presented a paper that had to do with the immunology of wart viruses and **<T: 55 min>** one group went home and repeated my work and published it, like, a week later—maybe three nights later, before my paper was published. They published it before it went public.

JONES: That's an interesting little episode in the history of science.

PASS: It is, and it's surrounding more to do with the politics of science. If we skip forward thirty years, you would realize that all the sudden I got up one day and somebody had sent me an article from the *Philadelphia Inquirer* about Harald zur Hausen's discovery. I turned to my wife and I said, "I bet you a buck he's hired a PR pro," and he most certainly had. I called Gérard Orth when Harald won the Nobel Prize and I asked him how he felt about it because it was really his original idea . . . maybe our observations but his—

JONES: Yeah, you said that.

PASS: . . . but his idea. I like to see the guy with the ideas honored. He's retired and he was unfazed. He didn't care one way or the other. Tony Faras and I, and some of the young men that we were working with at the time, probably the young men more than us, have been uncomfortable because of that. Anyhow, now it's 1978 and we get a call to Tony's lab from a veterinarian on campus in the vet school saying that there's a herd of dairy cattle in southern Minnesota—actually about sixty miles south of Minneapolis—that the calves are severely infected with warts. So—

JONES: Was that unusual for . . . or at that time?

PASS: No, I mean we knew there was a bovine papilloma virus but we weren't paying any attention to it but we knew that rabbits have papilloma virus, and [Richard Edwin] Shope had discovered that while a faculty member at the University of Minnesota. Shope's lab technician was still around and I used him to trap rabbits for me on the Mississippi riverfront of the medical school, and we in fact did some experiments on those rabbits with the Shope virus, but we weren't looking at the bovine virus at all. So we drove down and I recall the day, I was driving a Jeep, like a Jeep Wrangler, a real Jeep, before there was a Wrangler, and Tony and I and my very young son drove down there. And we saw these calves, there were, like, fourteen of them. One of them had fourteen pounds of warts on them.

JONES: The exact size of them and weight of them, is that how you know fourteen pounds?

PASS: They actually took that calf to the slaughterhouse so for months we had fantasies about wart burgers at McDonald's [Corporation]. Why would they waste those warts? No, we heard that secondhand. So–

JONES: Yeah, well, maybe hot dogs, right?

PASS: But driving home from the farm that day, it was the Anderson Farm, I said, "I think we should make a vaccine for calves, vaccinate them against warts."

Tony said, "I know how to do that. We'll use recombinant DNA technology; we'll make what's effectively a subunit vaccine but cloning the protein on the surface of the virus.

Then I said, "You know, I've been doing some consulting in the pharmaceutical industry—"

JONES: You had been . . . ? **<T: 60 min>**

PASS: Yeah.

JONES: You told me about that.

PASS: I'll come back to that in just a minute. "I think we should start a company to do that. We shouldn't do that at the university. It's separate from our cancer research, there's no conflict of interest, and we could do it as principals in a company."

He said, "You know? I know a guy at UCSF [University California, San Francisco]. I think he has started a company."

"What's his name?"

"His name is Herb Boyer."[2]

JONES: Yeah, what's the year here? This is what?

PASS: Seventy-eight.

JONES: Seventy-eight, so yeah.

PASS: They started in '76.

JONES: Yeah, and they're still very small.

PASS: They were.

JONES: Until they clone insulin, then everybody knows about them.

PASS: Right. So, he said, "How do we start a company?"

I said, "I don't know, but on Saturday morning I fish with Norman, and Norman knows all about starting companies. He's a consultant and we'll talk to Norman.

Norman said, "You have to write a business plan."

JONES: And Norman. Norman who?

[2] Herbert W. Boyer, interview by Arnold Thackary, Sally Smith-Hughes, and Mark Jones in Boston, Massachusetts and San Francisco, California, 28 March 2000, 24 April 2013, and 21 May 2013 (Philadelphia: Science History Institute, Oral History Transcript # 0193, in process).

PASS: Norman Sidley.

JONES: Sidley.

PASS: Then I said . . .

JONES: Tony's a fisherman too?

PASS: He is, and Tony and I fished together but he didn't fish on Saturday mornings with Norman and me. I got the three of us in a room together and we decided we would start a company, and Norman convinced us that he would give a third of it to us and get a third of it.

JONES: Had you thought previously about starting a company?

PASS: Yes.

JONES: What had sent your thoughts down that path besides the need to make more money?

PASS: In the summer of 1970—well, probably in '71, I got a call. At Einstein you took August off. You know, if you were a psychiatrist all your patients committed suicide, but I was a dermatologist. I wasn't missed. I would take my family back. In '71 I was still living with my first wife and we went back to LA, and I got to LA and the next day I got a call from Abe [Abraham] White. Are you familiar with . . . they were the standard biochemistry textbook in medical schools at that time, was White, Handler, and Smith. Abe was the Chairman of the Department of Biochemistry and him and I got friendly because [. . .].

It was Abe White on the phone to me and he had a . . . when I got to Einstein he had a postdoc in his lab whose name was Allan [L.] Goldstein, went on to be Chairman of Biochemistry at George Washington University. I don't know if he's retired yet; I think he's been there for a number of years. [. . .] So one day a week Allan and I would have lunch in Abe's office with Abe, not a big office, tiny little office, and we were postdocs. But that continued on when we were faculty members. Abe called and he **<T: 65 min>** said, "I want to give your name to a friend of mine who can use you as a consultant and if you don't mind, I'll have him call you."

His name was Irv [Irving] Sollins—it's a very interesting name. So, Herb's on the phone the next day and he tells me what his needs are and I said, "Great, my power alley. I'll be back in town August 30 and we'll get together."

"No," he said, "you'll be in my office tomorrow morning."

I said, "You got to be kidding."

"No," he says. "Buy yourself a first-class ticket and be in my office at 10:00 a.m. tomorrow morning." I did. I worked with Herb as a consultant for two years. Herb was a pharmaceutical entrepreneur.

JONES: At a time when pharmaceutical entrepreneurs are rare; it's a hard industry to break into.

PASS: Right, I'll tell you how he did it. He had just been brought out of retirement by his friend who was the Chairman of Novo[zymes A/S], the enzyme company in Copenhagen, [Denmark]. They had just brought enzymes into laundry detergents in the US and there was a controversy about the safety—both from a systemic immunologic standpoint and cutaneous. I'm an immunochemist, dermatologist, natural. By the way, before I came to New York he said, "And if I like you, tomorrow, tomorrow night you'll be on a plane to Copenhagen." That next day I had lunch with the chairman in his private dining room. I thought that was cool.

JONES: The chairman of Novo?

PASS: [Yes].

JONES: In Copenhagen?

PASS: [Yes], that was pretty cool.

JONES: Yeah. Yeah.

PASS: The Soap and Detergent Association put together a study group to kind of solve the problem and I participated in the planning of what needed to be done.

JONES: What was the problem?

PASS: It was the protein.

JONES: And it was allergenic?

PASS: It was allergenic. It didn't cause problems in consumers, but it did cause problems in factory workers. We proved it.

JONES: You had to do research to establish the problem?

PASS: That project probably went on for about ten years. We either won the battle or the war and lost the other one because in the interim, Proctor & Gamble [Company] took the enzymes out of Tide, which is this company's source of revenue. But I stayed on as a consultant to Novo for a year or two even after I moved to Minneapolis. Irv Sollins was a boy from Baltimore who got a PhD in public health, maybe at Johns Hopkins [University], got drafted **<T: 70 min>** [World War II] into the public health service and went as a public health officer to the City of Chicago, [Illinois], which was full of sailors with venereal disease and we cleaned it up.

JONES: How did you do that?

PASS: I have no idea. I have no recollection now; you'd have to do a little research. But you should think about Irv sort of, well, at least in the history of biotechnology, Irv, at the end of the war he was invited by the government who had an organization called, I think it was called UNRA—UNRA [United National Relief and Rehabilitation Administration]. But his job was to go around the world and beg for drugs to put in Western Europe at the end of the war, in 1945. And during the course which he did successfully, but during the course of his travels he went to Mexico City, [Mexico] to get I think what he was after was topical steroids from the company that became [Laboratorios] Syntex [SA].

JONES: No kidding.

PASS: I think there were two brothers, and you'd have to do a little research. They fell in love with Irv and they invited him to join Syntex when his finished his project and he did. Irv is somehow or other responsible for the birth control industry in the United States.

JONES: He was involved in synthesizing, what was it? What part of it?

PASS: In managing that process. So Gregory [Goodwin] Pincus—people like that were his buddies.

JONES: If Pincus was involved with Cyril [Grob], [George] Rosenkranz and [Carl Djerassi] and [Alejandro] Zaffaroni, those were the guys at Syntex who synthesized.[3]

PASS: Initially they worked for Irv. He hired Abe White out of Yale and Abe went full-time with Syntex, and I don't know how they got moved from Mexico City to Palo Alto, [California], but they did.

JONES: Yeah, yeah, that was 1962, '64?

PASS: I don't know when Abe went to Einstein, but he went from Yale to Syntex to Einstein. That was the connection with Irv Sollins. So, now, I can't accurately tell you the details because Irv was a private guy, but he was kind of like a father figure to me. I was in my thirties and—

JONES: He offered you this exciting opportunity.

PASS: To consult. Then what he did is he got colon cancer and the cancer was about the size of my little fingernail—very small—and it scared him badly. I went to see him in the hospital, I remember, and I went to see him. After he got out of the hospital two months later, he gave me a call and he said, "I want you to meet me for lunch." He had a favorite restaurant in the Mamaroneck, [New York].

I met him and he said, "Here's what's going on. Tomorrow the patents on birth control pills expire and I want to start the next day—the day after tomorrow—I want to start a generic birth control pill. We're going to make them for a nickel and we're going to sell them in **<T: 75 min>** Africa for a dollar a month," or whatever, a year. I don't know.

"But I can't do it by myself, so I want you to leave Einstein and join me, and you're going to be the feet on the ground in this enterprise. Will you do it?"

---

[3] George Rosenkranz, interview by James G. Traynham at New York City, New York, 17 May 1997 (Philadelphia: Chemical Heritage Foundation, Oral History Transcript # 0159); Carl Djerassi, interview by Jeffrey Sturchio and Arnold Thackray at Stanford University, Stanford, California, 31 July 1985 (Philadelphia: Chemical Heritage Foundation, Oral History Transcript # 0017).

I gave it about ten seconds of good thought and I said, “I’m in.” He said, “I’ll call you in a week.”

He called me in a week, and he said, “I can’t do it. I’m too frightened about the cancer and everything, and it’s not going to work anymore. I’m going to stay retired.” He had retired from Novo. We didn’t do that, but it set off a few wheels in my head. I had also been doing some consulting in the dermatology area for Schering-Plough [Corporation] for DermAid, which were in Philadelphia, [Pennsylvania], so I had kind of a feel, whatever you can have as a consultant, of what those businesses might be like. And that’s what I had been talking to Tony Faras about.

JONES: Although those are big businesses?

PASS: Salantz retired from Syntex and he sold his equity in Syntex for something like five million dollars, and he had owned 25 percent of the company as you can imagine. He bought a farm in Puerto Rico and started growing Mexican yams.

JONES: That’s where they derived . . . ?

PASS: He started the birth control businesses for Cyril and J&J [Johnson & Johnson]. He’s trying to retire and maybe get sucked back into the business. So, he was a real pharmaceutical entrepreneur. His steroid nucleus has been discovered as a plant extract by a guy by the name of Marker, who is a biochemist at Harvard, and he’s an interesting part of that story. He had rented a hotel room [. . .] he purified some compound from the forests of Mexico in a hotel room in Mexico City and brought it into the brothers at Syntex and kind of dumped it in our lab, and that was really the birth of that industry. I don’t know the connection to yams and so forth but—

JONES: So it was the extract from the yams that was . . . and marker—

PASS: So Irv had been involved in all of that. We wrote a business plan in ’78, we—

JONES: Had you been aware of . . .

PASS: Nothing.

JONES: Nothing?

PASS: I lived in the outback. We knew that Herb Boyer had a business. Tony wanted to give Boyer a call: "We'll learn something."

"Academicians shouldn't be screwing around with companies. I'm a—"

JONES: So he was resisting the idea?

PASS: Yeah, he wouldn't call Herb Boyer. So, we wrote a business plan; by that time, Abe had retired from Einstein and he had gone to Syntex in Palo Alto. And when we had a business plan, let's say in the fall **<T: 80 min>** of 1978, and I'll tell you what the plan was in a minute, but this is cute story. Abe said, "I'll introduce you to venture capitalist that we have in residence at Syntex and maybe I'll come out here and meet the guy," which I did, and I said, "That's a cute business but I don't think we're interested in that."

JONES: What was his name?

PASS: I don't recall. A venture capitalist at Syntex, I don't recall.

JONES: It wasn't [Alejandro] Zaffaroni, was it?

PASS: Oh, no, no, no. By that time Zaffaroni had—

JONES: He was gone?

PASS: He was gone.

JONES: Oh, this is the seventies. Yeah, long gone.

PASS: This is '78.

JONES: Yeah, he's gone ten years, yeah.

PASS: I never met Zaffaroni. I never met Carl Djerrasi either, but I knew those guys through Abe because I was serving close to Abe until he died. We had fussed around with what we were gonna call this thing and we called it Biogene, and we took it to Syntex and the guy said, "Nice business plan but I think I saw a business plan of a company in Boston, [Massachusetts] called Biogen."

"Oh, shit, we better change the name." [laughter]

So we spent all night one night drinking and trying to think of what our next name was and we couldn't think of a name so we just called it Molecular Genetics Inc. Now, the interesting thing is after we got funded a year later in '79, we heard that there was a company that had started in Los Angeles called Applied Molecular Genetics. So I got my lawyer—I didn't know George Rathmann—I got my lawyer to write George a letter and he wrote back all apologetic.[4] They had a meeting and they renamed the company Amgen [Incorporated] which was a much better name than either Molecular Genetics or Applied Genetics. [laughter]

JONES: Yeah, as it turns out, yeah, it was.

PASS: So for years when George would come to speak in Minneapolis, he would credit me with the name. [. . .] So we wrote a business plan to make a vaccine for bovine wart virus for cows. That's all we were going to do.

JONES: And that's what the plan said? This was before you had funding, this is just an idea?

PASS: Yeah, but we wrote that up, let's say by the first of October of 1978. We didn't raise money until November 1979, so it took us maybe thirteen, fourteen months to raise [1.2 million dollars].

JONES: Where did you go? What kind of attempts did you make?

PASS: We just really put Norman in charge of raising the money.

[4] George B. Rathmann, interview by Arnold Thackray, Leo Slater, and David Brock in Philadelphia, Pennsylvania, 16-17 September 1999 (Philadelphia: Chemical Heritage Foundation, Oral History Transcript # 0187).

JONES: And he's a friend of yours? What was his background?

PASS: Norman was a consultant to Honeywell [International Inc.] for years. We never knew what Norman did but he was savvy.

JONES: And he was the business guy?

PASS: He was a very bright guy. He's my age. I knew him from college; he married a very good friend of mine, yeah. Because we talked to venture capitalists.

JONES: From where—the East Coast? The West Coast?

PASS: Probably not much in the West Coast but maybe a couple. We did **<T: 85 min>** a few small venture capital firms around the Twin Cities. Go ahead and eat that.

JONES: Oh, okay.

PASS: I don't know what's happening. I'll get my coffee. Maybe you'll have coffee with me. So, now [. . .] we finally tracked investors, let's say it's the spring of 1979 in April, May. We've got some investors lined up and the lead is going to be a venture capital firm that's part of now Wells Fargo [& Company]. It was Northwest Bank, it was called the Growth Firm, and there were two young men in the growth firm that had come from Harvard Business School in '77 or '78. We met them probably in early '79, and we lined up four investors.

JONES: They were the first?

PASS: They were one. They became the lead and responsible for the due diligence. The other investors were Sprout, Donaldson, Lufkin & Jenrette, First Chicago [Bank], which was still a bank back then, and an angel investor in the Twin Cities.

JONES: And what was his or her interest in this project?

PASS: They were just philanthropic and they thought that this could lead to something that would benefit colleges. The whole process of their due diligence was pretty interesting,

especially Sprouts. Sprouts sent in one of the cofounders of Data General, something, one of the Boston firms who told us that you couldn't put mammalian genes into bacteria, that would never work.

JONES: That was in Boston before it was done? What was the year here?

PASS: No, it had been done.

JONES: Yeah, that would be '74, '73, yeah.

PASS: It was '78, '79. Anyway, now we've got the draft of an agreement with the investors, shareholders, stock purchase agreements. And by accident, there's dedication of a new building on the Duluth campus of the Medical School and the guest speakers are going to be Tony Faras, who graduated from there, and Herb Boyer. They go out for drinks and now at the eleventh hour, he tells Herb what we're up to. Herb said, "Don't sign anything. The two of you get in an airplane, I'll talk to Bob [Robert] Swanson, and you sit with Bob and spend the day at Genentech, [Incorporated]."

So we did. Bob picked us up at our hotel in San Francisco and we went down to Palo [. . .] The other guy attending that meeting was Eugene Kleiner, and they had read our business plan and they had read the author. Kleiner said, "No, we can do better than this. You know, why don't you go back to these guys and tell them you want one, two, three."

I said, "You've got to be nuts. It's taken us forever to find these guys. Now it's maybe, like, September or August, September, October—we're going to close."

They said, "You tell them that if they don't give you the money with those terms, then I will." **<T: 90 min>**

JONES: Eugene Kleiner's, he's one of the pioneers of Silicone Valley.

PASS: The only day I ever saw him, but we spent the whole day together and we went back to our guys and made them this counteroffer, and the next day they accepted it.

JONES: It was a worthwhile journey then, to go to Genentech.

PASS: But there was a wrinkle; later in the day we looked around the Genentech building. There were sixteen employees. Bob Swanson said, "You know, we don't do any immunological stuff at all or anything that's like what you guys do—virology."

JONES: You know what? Well, Genentech actually did talk about getting into animal vaccines. Was Dennis Kleid there that day? Did you meet Dennis Kleid?

PASS: No, but I bet he was one of the first sixteen people.

JONES: He was, he went there with Goeddel, David [V.] Goeddel. Did you meet Goeddel?

PASS: We met Goeddel, and we met a Dutch guy. Who was the Dutch guy?

JONES: Heyneker, Herb [Herbert] Heyneker.

PASS: Herb Heyneker.

JONES: Yeah, and—

PASS: So they said, "Don't start a separate company, just move out here and you'll be the seventeenth and eighteenth employees. Come work here." [laughter]

We said, "We can't do that. That's a terrible idea." [laughter] "That's a terrible idea."

I'll teach you a corollary to that idea later because that happened again. We started. We incorporated November 1979. I had already hired an administrative assistant. She was in residence in my dermatology office. I tried to do both things for a while, practice a little dermatology, and run the company. Oh, now it's getting close to—we sort of got our hands on the money but we're not getting along with Norman. Now we're not—

JONES: He's your friend, yeah?

PASS: Yeah. We're not getting along with each other. We're kind of all yelling and screaming at each other.

JONES: What was going wrong?

PASS: I don't know. So, Tony and I—because you know, we saw Norman every week and everything. But Tony and I were together almost every day. Maybe Norman is the problem here. Norman's doing stuff that we're not comfortable with and we incubated that idea for a month or two and decided that Norman was the problem and we were going to part company. The day we closed with the investors in our lawyer's office, Norman was in one office like the Wizard of Oz behind a curtain, and the investors were out here, and it was sort of a three-ring circus. Basically, that day we plucked Norman out.

JONES: Was that a difficult thing for you?

PASS: No. It had wrecked—

JONES: I mean was he your friend?

PASS: That was the last I saw of Norman.

JONES: So you bought him out with the funds?

PASS: Just with stock, a ballistic stock. He wasn't going to be a consultant to us or anything because we couldn't get along. The postdoc from the university that had been working on the papilloma virus came over as the first employee. We rented about two thousand square feet of space **<T: 95 min>** and built out a small laboratory.

JONES: Over at . . .

PASS: Right behind the [inaudible] and we were in business. I didn't know how to do it . . .

JONES: How to do what—the business or doing the vaccine?

PASS: The business. So I was tutored by the Northwest Growth Fund partner was on their board. He came over on Wednesday afternoon, he taught our administrative assistant, this young woman, how to . . .

JONES: What was her name?

PASS: Ellen Hendrickson. Most of the following twenty-two years she was my administrative assistant in three different businesses. A little time off to have a baby and came back. He taught her how to do projections and budgeting and all that kind of thing. Then the company got going a bit. I hired a chief financial officer, his name was Robert Ort. He had come from SRI [International], he's a recent Stanford [Graduate School of] Business School graduate. He said that he would take the job as our CFO if I would take an evening accounting course. I went to—

JONES: So you would have the same language?

PASS: So I took an evening account—I slept through ten weeks of accounting and read the book and that's how all that went. We hadn't been in business very long when everything started to pop and it was clear that we needed to raise more money and more or less broaden our vision. So we went from a wart vaccine to some other animal vaccines, and we went out to raise some more money, and there was no terminology at that time, but basically what we were looking for was a strategic partner that had deep pockets. We spent a lot of time talking to Standard Oil in this tall white building in downtown Chicago, [Illinois], and American Cyanamid [Company]. Because American Cyanamid had an agricultural business, that seemed to be a better bet.

But by that time there was a very good group of plant molecular biologists at the University of Minnesota, and they went to a conference at Rockefeller [University] in New York in May of probably 1981. When they came home, they asked if they could meet with us; there were four of them, and they said, "We're being urged to start a company. Can you guys give us some guidance?"

We said, "You don't want to start a company. We got a company, just take a hunk of this company and when we go to that farm sixty miles south all the time, that's a corn farm, we see lots of corn; there must be some synergies here." So we got into the corn genetics business.

JONES: Did you have any concerns about getting defocused?

PASS: Sure. We did that and in the long run the corn genetics had more value than the animal vaccine.

JONES: Did the animal vaccines work?

PASS: One of them—the wart one—did and that was a mistake, another mistake. We made a subunit vaccine by cloning and expressing one of the—

JONES: Code proteins?

PASS: . . . main code proteins. **<T: 100 min>** I think it's called the L protein. And we could protect calves with—we grouped kind of, not the greatest group in the world, but almost the greatest. Meanwhile, we had built quite an organization and we were starting to look at other things like the economics of these projects, and it became clear that bovine wart vaccine wasn't working.

JONES: Wasn't big enough? Yeah. The market wasn't big enough?

PASS: We had a guy working on it, this is probably around 1984. We dropped it, we dropped the patent application, but he presented at a conference and at the end of the conference he said, "The immunogenicity isn't great. Probably what we have to do is learn how to reassemble whole capsid and vaccinate with that." And in the audience was the guy who did that.

JONES: Who did it?

PASS: NIH group, Doug Rogers and can't remember the name of the other guy. I know he's a dermatologist.

JONES: And did that get commercialized?

PASS: Yes.

JONES: Who got the license?

PASS: I think that's the Merck Group. I think Merk and Glaxo [SmithKline plc] both had vaccines. I'd have to think about that one—

JONES: And Merck is the lightweight suspect, yeah.

PASS: Now, there was no basic patent on that concept. The patents in fact I believe related to the manufacturing—

JONES: The recombinant manufacturing?

PASS: No, the reassembling. Then I don't know what Glaxo's breakthrough was. I think Glaxo actually wound up with our clone. We had some East Coast collaborators and we let them more or less walk off with the material.

JONES: You just dropped it and . . . yeah.

PASS: We just dropped it. So, I'm going to tell you another story. You might ask why we weren't in the human biotechnology pharmaceutical realm of things. Well, fairly early on we had to go back and do a little research. I saw the cover of the magazine section of the *New York Times'* Sunday magazine; there was a picture of this man who went from UCSF over to Genentech with the stuff.[5]

JONES: It was Aldrige or [Peter] Seeburg?

PASS: He's a Scandinavian.

JONES: They're German, Seeburg and Alridge. They took the stuff out of the freezer, took the human growth form—

PASS: Seeburg's picture was on the cover of the magazine section. I read that article and I saw that there was a physician involved in all of that by the name of John [D.] Baxter.

[5] Barnaby J. Feder, "Genentech Agrees to Settle Dispute," *New York Times,* November 17, 1999.

JONES: Yeah, he was UCSF, yeah.

PASS: I called John and I said, "Wow, you're in Minneapolis."

He said . . . . John was from—John's dead—John was from Kentucky and he said, "When I was a kid my daddy would drive me up and we would fish in Northern Minnesota. I love Minnesota." He had this Southern accent, "Can I come and visit you guys?" [laughter]

So he came out. It was probably '82, and I said, "Why don't you join us?" We just created a corn division; we'll create a human pharmaceutical division.

"Oh, great. Let's write that up, I got some great ideas. I think we could clone erythropoietin and that would be an interesting drug."

"Okay, John, why don't you join us?" So, we wrote this business plan, we made him an offer, and simultaneously he was approached by **<T: 105 min>** EF Hutton [& Company]. They wrote him a check for ten million bucks.

I called one day, called his phone. I called his lab, he's not in the lab, he's home. I call his home, it's his wife and he hasn't been out of bed in forty-eight hours. He was kind of a nervous guy but John was a real idea guy. John was brilliant. He couldn't get out of bed, couldn't talk to me. He resurfaced the following week and he said call me.

He said, "I can't do it. I got to do my own thing. I got to take the EF Hutton money," and he started Calbin. "Here's all these guys—Bill [William J.] Rutters, Herb Boyer, they've got their own companies, you know, I can't not have my own company."

It was an ego thing. And you know, it wasn't a bad decision. Hell, bio made a bunch of bad decisions but they didn't be late to taking the first ten million. So, there's another guy, situation, "Well, I can't go with you, I got to do my own thing." [laughter]

JONES: Right. I had no idea there were all these tie-ins—Syntex, Genentech, UCSF.

PASS: Sure. Now, I don't think that was true for everybody, but it was true. I think in the very beginning that Rutter was on the scientific advisory board of—he was, like, a sole founder of Amgen.

JONES: I think they wanted him to have Amgen North but at some point he wanted—and he told Rathmann, "No, I want to do my own thing." I think that's how that went.

PASS: So there was a lot of interconnection. We took our company public in—

JONES: Nineteen eighty-two?

PASS: Eighty-three.

JONES: Was it ’83?

PASS: I think it was ’83. It might have been ’82.

JONES: I think it was ’82. Eighty-two wasn’t . . . . Eighty-three was actually a good year for IPOs [initial public offering], wasn’t it?

PASS: Eighty-two, we took it public.

JONES: Yeah.

PASS: And we were having trouble doing an IPO and we did kind of a busted IPO. We raised, like, a million bucks. Piper Jaffray here in town raised all the money. DLJ [Donaldson, Lufkin, and Jenrette] and Montgomery Securities raised not a penny, and—

JONES: What went wrong with it? They just said, oh, we can’t do it, or the market’s not there?

PASS: The market was just weak.

JONES: Yeah.

PASS: But we were left without much cash, so we had to scramble, and two things happened somehow or other and I don’t recall how, I was introduced to Martin Marietta, the Chief Financial Officer of Martin Marietta [Corporation]. And he was having simultaneous discussions and with Peter [D.] Meldrum in Salt Lake City, [Utah], at Native Plants

[Incorporated], which became NPI.[6] They said, "We'd like to form a consortium between the three of you and with us looking over your shoulder. We'll get you all in a room together twice a year or something like that and as a matter of good faith, here's a check for ten million dollars." So we did that.

JONES: You did it?

PASS: [Yes]. I never got friendly with Peter, but I did get friendly with [Edward] Penhoet and Rutter. I got some other connections to Rutter, we had a—

JONES: And the idea was to work on human vaccines because that—

PASS: No, no, because Native Plants was doing plant stuff, we were doing plant and animal, and the other people were doing human.

JONES: Yeah, okay, so it's just—

PASS: So we really for two or three years really hung out together. That deal was probably closed before the end **<T: 110 min>** of '82 but meanwhile—

JONES: Is there any documentation for that? Because that's a real interesting story; I'd never heard it before.

PASS: Oh, have you talked to Ed Penhoet?

JONES: Not about that. I mean, it's . . . if you wanted to—

PASS: Why don't you ask him about that?

JONES: Yeah, yeah. Yeah, we will.

---

[6] Peter Meldrum, interview by Brianna Rego Lind in Salt Lake City, Utah, 25 October 2013 (Philadelphia: Science History Institute, Research Interview Transcript # 0040).

PASS: Have you talked to Peter Meldrum? You will?

JONES: Yes, yeah.

PASS: Ask him.

JONES: Yeah.

PASS: We went to San Francisco, we went in Salt Lake [City], we were in Minneapolis.

JONES: Yeah, no, it's just interesting as one of these stories that hasn't been told.

PASS: We never did anything, never did anything. Now—

JONES: Were there good ideas? What came out of the discussion?

PASS: I don't think so.

JONES: Yeah [laughter].

PASS: Now, that deal busted. That IPO was weak, and I'm walking through the airport one day and I run into my friend Mark Greenberg who's a stockbroker in Minneapolis. We grew up together in Duluth and, you know, we start talking.

I said, "You're a stockbroker for Kidder, Peabody [& Company]. I need a veteran investment banker."

He said, "You should meet my guy in Chicago, Ted Berghorst." Has he crossed your radar screen?

JONES: Nope.

PASS: Sure, and by the way, my banker at DLJ was Tony James, Hamilton James III, who's the number two guy at Glaxo. [Stephen A.] Schwarzman, you know Schwarzman? They're the founders of this humongous hedge fund [Blackstone Inc.]. He's very successful, very, very successful but we're not on speaking terms.

He said, "Let me make a couple calls."

So Mark made a couple calls, and I get a call from Berghorst and we meet, and he brings out an analyst from New Yorker whose name—at Kidder, Peabody—whose name is Doug Rogers. Has he crossed your screen?

JONES: No.

PASS: He should. I'll tell you why. So, that's all been good, they're going to raise some money for us, and the other thing is we were going to do—are you running out of—

JONES: No, no, I'm just checking the battery. I want to make sure the battery is still there.

PASS: So, we're going to hire Kidder, we think about hiring Kidder, but I don't know the timing of that. Marietta, Kidder, and then there's the third thing. We decided just to do something called an R&D Limited partnership, and we did that with—what was the name of the firm in New York? It might have been AJ Becker [Investment Agency], a large New York brokerage firm, and I think Piper was part of that. We raised two million that way and—

JONES: And that has to be for specific projects, right?

PASS: We were throwing the vaccine stuff, the bovine vaccine, into the R&D Limited partnership. Big deal. So ten million with that. Now that winter there's a lot of conversation about herpes virus work; it's starting to look pretty good.

JONES: Conversation in financial circles?

PASS: With the stockbrokers. Stockbrokers are thinking about genital herpes. We're doing herpes in pigs or something and they're thinking about their genitalia. Our stock goes from zero to sixteen, something like that, and so we do a secondary with Kidder as the lead. Now we've about twenty . . . no, wait, about twenty-three million [dollars is] in the bank. **<T: 115 min>** That was good; we always had money after that. There were times where the stock got low and

in ’86 we did a— [. . .] We did another offer, a secondary with Kidder as well, and raised, like, another twenty million. Berghorst and I raised a lot of money together. By the time the R&D and the partnership and the Marietta thing, we had a fairly close relationship.

JONES: So, he’s instrumental in building—

PASS: No, in the ’86 . . . okay, let’s go back to the ’86 thing.

JONES: Okay, the partner—the R&D Limited partnership?

PASS: No, now we’re going into secondary.

JONES: No? Oh, the secondary offering.

PASS: We think we needed another banker and by that time Doug Rogers has moved to Lehman Brothers [Holding Incorporated] and I’m being courted by Fred [Frederick] Frank.[7] So we actually did—he was a lead banker on that offering and by that time I jettisoned Piper and my banker at Piper never talked to me again. I jettisoned DLJ and Tony James. Didn’t want to talk to them again.

JONES: But you thought it would be better to go with the Lehman Brothers?

PASS: I thought it’d be better to have the money. I thought banking relationships were not too relational, that they were fee-for-service businesses and so forth.

JONES: Yeah, not really.

PASS: You know, they’re probably—it wouldn’t have hurt, particularly if we had kept DLJ around. Piper and this regional market wasn’t worth much value to us. It was okay when you’re raising a million dollars, but if you wanted to raise twenty million or more, it wasn’t material. Montgomery Security’s never given us any, they didn’t stick around very much.

[7] Frederick Frank, interview by Mark Jones at Peter J. Solomon Company and via phone, New York, New York, 25 May and 14 September 2011 and 16 August 2013 (Philadelphia: Science History Institute, Oral History Transcript # 1005).

JONES: Right, so there's no reason to have any loyalty.

PASS: No, but they had an analyst. I can't think of her name. She lives in San Francisco.

JONES: Denise?

PASS: No, she went to work for George Rathmann eventually.

JONES: I don't know. At Amgen? After, at Icos [Corporation]?

PASS: Icos. She was special, she's great. And I'm sure she still lives in the Bay Area. No, there's no documentation much for any of this stuff. This is an oral history, that's about it.

JONES: Yeah, well, they're great stories and—

PASS: Yeah, so we took that offering probably around June of 1986. That's kind of tough sledding and somehow or other my boardroom gets messy, and by November of '86, I'm out of Molecular Genetics. They're going to become a human pharmaceutical company and two of their Northwest guys by that time has his own venture fund, and the angel investor and I started another plant molecular biology company. Not animal vaccines. It's called Bioseeds [Research Limited]. And then later in 1990 we sell that to Celgene [Corporation]. By that time, [Roger H.] Salquist and I, pretty friendly. Have you taken Roger's?

JONES: Yeah, yeah, I like Roger. Yeah, he's a trustee at the **<T: 120 min>** University of San Francisco and we're going to do some event with him.

PASS: It came to mind the other day, I saw on like Turner Classic Movies or something I saw that there had been a show of a movie called *Run Silent, Run Deep*.[8] Roger had been a captain of the submarine, so when we were putting a deal together, my side was called Run Silent, Run Deep. That was our secret code name. And our secret code name for Roger was Captain Nemo. [laughter]

[8] *Run Silent, Run Deep*, directed by Robert Wise (Hecht-Hill-Lancaster Production, 1956).

JONES: Had you been keeping track of Celgene? Because they got started just a little bit after you did.

PASS: Yes, I did. I knew the original CEO and then when Roger took over, I remember my wife and I drove up to Davis, [California], and had dinner with him and his wife. We were friendly competitors in the plant genetics area, and they really weren't looking to put genes into maize, which is what our Bioseeds was set up to do. By the time we were doing that, we did a different business model. We bought a seed company, a controlling interest in a seed company, in early 1988.

JONES: But before we get into Bioseeds and this part of it, let me just ask a couple of questions going backwards.

PASS: Sure.

JONES: Very early on, you are working with the plant scientist here, right? So, you're keeping an eye on Celgene and there was Advanced Genetic Sciences, I think?

PASS: And PGS.

JONES: And PGS [Plant Genetic System] in Europe.

PASS: Walter De Logi, in Belgium. I'd been out over there, and he and I and gone out to dinner together and gotten acquainted, and I still get a Christmas—he's in Malibu, [California]. I still get a Christmas card from him.

JONES: Oh, well, maybe you could help me get in touch with him?

PASS: Yes, I can. He's co-founder of Ceres [Nanoscience Incorporated] and one of my main advisors on the plant side was a scientist by the name of Richard Flavell who's the Chief Scientific Officer of Ceres in Thousand Oaks, [California]. And he was lured there by Walter from a plant molecular biology institute in England, the John [Ines Centre] Institute.

JONES: And there's also the . . . . I would like to get contact information for these folks so we can tie it all together.

PASS: Yeah, you can.

JONES: And there's also Agro Genetics [Limited], do you remember them?

PASS: Yeah, David Padwa and I became very good friends.

JONES: Did you? Yeah, I went to Santa Fe, [New Mexico]; he's in Santa Fe, to talk to him.

PASS: Yeah, have you talked to him?

JONES: Yeah.

PASS: How is he?

JONES: He looks great. He's eighty, I think.

PASS: Yeah, I wondered how old he was.

JONES: He's eighty, I think.

PASS: It turned out that his oldest daughter—maybe it's his only child—and my oldest son went to college . . . were classmates at Wesleyan [University] and David was single then, probably still is, and we would drive—

JONES: No, he's married now.

PASS: Are you aware of this weird lawsuit he's involved with?[9]

[9] See Padwa v. Hadley, 981 P.2d 1234 (1999). Accessed at https://law.justia.com/cases/new-mexico/court-of-appeals/1999/19-038-2.html on 26 February 2026.

JONES: Well, I know there's a lot of weirdness around David, I think, but what—

PASS: Okay, well, I don't really care to record that.

JONES: Oh, I can turn it off and we can—

[END OF AUDIO, FILE 1.1]

PASS: . . . he started buying seed companies and then there became the discipline of agricultural biotechnology, which would make those seed companies worth some multiple of what he had paid for them. So he became an ag biotech entrepreneur. When we started getting into things—this was probably '82—I decided we needed a sophisticated patent consult that probably wasn't available in Minneapolis. And my friends in New York took me to a guy by the name of Leslie Mizrah.

JONES: Oh, he was, like, the dean?

PASS: And I went and interviewed him, and I came away feeling very negatively. I had separated from my wife in New York and I had sought the services of a New York divorce lawyer, and I got to a very slick guy who had an egg-timer on his desk.

JONES: Yeah, right, right, yeah. [laughter]

PASS: And that was a big turn-off, and I . . . when I met Leslie, he reminded me of that divorce lawyer and I thought, "Uh-uh." Shortly after Leslie was on a program at MIT the day Genentech went public. And I heard Leslie speak and I said, "Shit, I made a mistake." I called him up and he said, "Maybe you're too late. A guy by the name of David Padwa has engaged me and I can't take you on unless David agrees to it." So, David agreed to it.

JONES: Oh.

PASS: And so I was his second client.

JONES: That's interesting.

PASS: Yeah, and we had a relationship basically until his death. When we started another company, he continued it.

JONES: With Bioseeds. Before we get to Bioseeds, just . . . . I want to ask you. You get forced out of Molecular Genetics, how did—

PASS: We don't know. We don't know what the boardroom intrigue was, but it involved American Cyanamid and Martin Marietta, who both, each of them, had a board seat. I wasn't in a particularly good relationship with the American Cyanamid guy; we never became friendly. By that time, the relationship with Tony Faras and myself was cooling, and the number two and number three guys at Molecular Genetics somehow or other created enough intrigue to cost me my job.

JONES: So, there are sort of two issues there, I mean just personally having that stuff going on and getting forced out, how did that affect you personally? And then secondly, there's the issue of, well, they think the company should be in Lehman Pharmaceuticals rather than . . . . I mean it's a complete about face. Did you think that was a mistake at the time or did you think that maybe that was a good way to go?

PASS: No, I didn't have to think about that, I was gone. They bought back the portion of my stock; I still had a lot of shares. Stocks were sinking. I met my successor; I talked to him occasionally. The guy who followed him and I became kind of friendly, but it wasn't a need to second-guess it. Now, I left them with a great deal of cash, about forty million in cash in the bank, and they sold off assets for probably another twelve million to fifteen million dollars.

JONES: These are the research in—

PASS: Animal health technology, the plant genetic stuff, **<T: 05 min>** they sold it all. I started a subsidiary in the Netherlands, that should be another subject to talk about. Sorry I have so much to talk about.

JONES: It's great, it's great.

PASS: But we started a company there called Mogen and set up a subsidiary. I raised about five million bucks, let's say the summer of 1984 on to '85.

JONES: But should we have a second conversation about the—

PASS: Mogen. Okay, yeah.

JONES: About after we've talked about Molecular Genetics, maybe we could do the second half.

PASS: You want to talk about Mogen and Bioseeds?

JONES: Yeah.

PASS: Yeah.

JONES: Okay.

PASS: They're an important part of the story. The Bioseeds business model was a great idea, wiped out by the summer drought of 1988. We were highly leveraged to begin with, and we lost our whole seed crop in the field of Central Illinois that summer. And we had a corn feeding program that is now the mainstay of the specialty white dry-milling, corn-milling industry. And the ideas that would have fed into that were great.

JONES: Yeah, well, I'd like to hear how that came together but one thing that strikes me about this is that you're now about a thousand miles away from dermatology and virology, and into—it's interesting, it's just interesting.

PASS: Right. When I first got involved with business, by accident I became the assistant and then secretary treasurer of the American Academy of Dermatology, and that was at the same time when I was learning how to run a company. The President of the Dermatology Society is more or less of a figurehead, and the Secretary Treasurer runs the organization with a lay director in Chicago. What they were really lacking that I knew from my early business days was any kind of fiscal discipline.

So what I did during my tenure is I introduced some fiscal discipline to the society, which has become enormously rich, fiscally responsible. Now, they would have gotten there without me; it's just inevitable. They learned that a 501(c)(3) has a for-profit subsidiary and would sell education program, so forth, and that became a really major funding source for the organization. But I taught them that they had to have an audit committee, they had to meet twice a year. So, I'm a kind of busy entrepreneur.

Then in the Netherlands I did the same thing and in just a one-minute glimpse of the Netherlands, I went there and I got all the Dutch seed companies in a room together. And I told them, "We're going to start a plant molecular biology company here, research company."

They said, "Go away." [laughter]

They weren't too happy, but the Dutch government gave us about five million bucks in a couple of different forms, but we can talk about that because that's a good story. Now, back to Molecular Genetics, we were not just vaccines, we were also cloning bovine growth hormone because we thought the ST would be a product worth having. But we were having trouble with the cloning procedures.

JONES: Is it a tough molecule? Is it big?

PASS: I don't know what the technical problems were and I probably never knew. Now, I got wind of the fact that a Dutch scientist there, whose name is Herman De Boer, wanted to leave Genentech. And I thought, well . . .

So, I gave Herman a call and Herman came out and interviewed and said, "No, I got to do my own thing." And he went back to the Netherlands **<T: 10 min>** and started a company called Pharma. And today—

JONES: Was it Pharma or Pharming [Group NV]?

PASS: Pharming.

JONES: Pharming, yeah.

PASS: And I don't know if that was the original name, but they made a transgenic cow that was called Herman. And he was a remarkable bench scientist.

JONES: They did a lot of great stuff, they made one of those enzyme drugs there, or the—which disease?

PASS: What did they clone in the first cow? Ferritin was the name of it.

JONES: Yeah, they did and they had transgenic rabbits and they were purifying from the nook of these rabbits an enzyme replacement for—I can't think of the disease now. But enzyme deficiency, one of these organ deficiencies, and it became –

PASS: Well, they were good guys. Herman didn't have a leadership position there for a long time. Other people have come in to try to make a business out of that, not very successfully, over the years but I got a call shortly from Bob Swanson—

JONES: After raiding?

PASS: I didn't raid him; he couldn't take my job.

JONES: Yeah.

PASS: Bob said, "When are you going to be in San Francisco next?"

"I'm going to be in San Francisco next week."

He said, "Well, I would like you to come out for lunch." And he took me to lunch in the dining room; I hadn't been there in a couple years and now there are zillions of people around. I had been there. I had seen their first fermentation facility and so I had been there a few times. So he sat me down in the lunchroom and he said, "Do you see value in the relationship between you and me?"

"Absolutely," I said. "I can see a better relationship between you and me, Bob," and he said, "Great, then you'll keep your hands off of my employees. Because I hear that you've talked to a second employee, you and I are never talking again." I never talked to another employee. [laughter]

JONES: Yeah, that's interesting.

PASS: I was also a member of the first group that put the Trade Association together with IBA [Lifesciences], which Swanson didn't participate in.

JONES: Yeah. So, he did eventually but not at the beginning?

PASS: Not the first year.

JONES: Yeah.

PASS: So I was on the board that first year and I hired Harley whatever-his-name-was as the first director. I was on—

JONES: Price, Harvey Price.

PASS: Harvey Price. I was on that committee and that's where I got probably more friendly with George Rathmann, who was . . . he gave—

JONES: And Les [Leslie] Glick, he was involved in it.

PASS: Les Glick, yeah, what's happened to Les Glick?

JONES: He's in Florida, I went down there and talked to him. He's doing well, he's—

PASS: Good.

JONES: I think doing consulting or something.

PASS: And Gabe [Gabriel Schmergel]?[10]

[10] Gabriel Schmergel, interview by Arnold Thackray, Cassandra Stokes, and Mark Jones, Boston, Massachusetts and via phone on 15 December 2011 and 18 September 2012 (Philadelphia: Science History Institute, Oral History Transcript # 1035).

JONES: Gabe is retired. He's in Boston, and yeah, he's doing well.

PASS: Genetics Institute [Incorporated] was a very—as a scientist, that was really one of the—and who was the—what was the name of the founding scientist that—

JONES: There was Mark Ptashne, Tom Maniatis. Those were the two guys.

PASS: Mark was from South Minneapolis.

JONES: Oh, is that right?

PASS: The neighborhood we've just driven through. We can drive by his house. It's right between here and your hotel. [laughter]

JONES: Yeah, okay, good.

PASS: Yeah, so . . . but I didn't know him then. In fact, I don't think I've ever met him. I've probably talked to him on the phone. But it was a nice trip. So we recruited, we built Molecular Genetics up to the point where there were thirty-four PhD scientists and about ninety people in the laboratory, and they were terrific. We took young people freshly out of postdoctoral fellowships or shortly thereafter. The first research director we hired was from . . . was Claude Nash from Philadelphia, who later became cofounder **<T: 15 min>** of—I can't think of the name of the company but it'll come to me— [11]

JONES: We can look that up.

PASS: Immune . . .

JONES: There have been a lot of immune—

PASS: Something or other.

[11] Claude Nash cofounded and was CEO and chairman of ViroPharma Incorporated.

JONES: Immune Tech, Immune . . . yeah. Immunogen, Immunex . . .

PASS: Virimmune?

JONES: Could be. I'll look it up. Claude Nash.

PASS: Claude Nash, and then the second research director was Lynn [W.] Enquist. Claude didn't last very long. He came from a pharmaceutical company, [Glaxo]SmithKline, and –

JONES: Did you specifically want to get somebody from industry?

PASS: Yeah, but the young scientists didn't relate to the industry scientists well and he didn't last long. And then I brought in Lynn Enquist from the NIH, and Lynn is the Head of Molecular Biology at Princeton [University], and that was good chemistry. Bob [Robert] Keeshen was an advisor to us and that was sort of my entrée into Cold Spring Harbor. I kind of hung around with him for a few years.

JONES: With who?

PASS: Jim [James D.] Watson.

JONES: Oh, yeah.

PASS: But you should plug in—there's some people that you should plug into. Doug Rogers was active in Cold Spring Harbor, lived in Long Island, [New York], raised a lot of money for Cold Spring Harbor for Watson. And that was an important connection to me and in Bioseeds I supported a fellow in Cold Spring Harbor in the plant group. The young people worked with Barbara McClintock. Watson knew my papilloma virus work. He had some connections. There's a guy by the name of Mattie [Matthew D.] Scharff who was on the board of Cold Spring Harbor.

JONES: He was a microbiologist kind of guy?

PASS: I don't know what he is. But he's a molecular biologist. An immunologist, molecular biologist from Einstein, and he vouched for me and got me in the door at Cold Spring Harbor. So, all those things were like the frosting on a career for a country doctor were very nice.

JONES: It was an exciting time and really important stuff happened so it's great to hear all these connections. This is a big part of the story because it really, I have to give credit to the financial people, they did a good job of finding out who was really good with the science and.

PASS: Yes, and it wasn't real evident. There were other aspects to it. I had a terrific New York City public relations guy who was like a one-man boutique. But he'd call you and he'd say, "I want you to be at lunch next Wednesday at Coat Bass, grabbing lunch with a science editor of *Business Week Magazine*." Then an article three months later would come out and there you would be, and so forth. The *Wall Street Journal* science guy, I met him through—these people would court you so when they were doing something else—it was before the Internet.

They would call you up and say, "What do you think about so-and-so? I just met so-and-so last week. What do you think about their business?" Then you'd read your name in *Forbes* magazine or the *Wall Street Journal*, and that was great publicity. I got a call once from a Japanese holding company and they said, "We want to come to Minneapolis to meet you."

"Why do you want to meet me?"

And they said, "Well, we read your name in the *New York* **<T: 20 min>** *Times*. We read the Molecular Genetics in the *New York Times*."

I said, "So, what?"

And they said, "Well, you're going to be successful."

You know, it was January of 1982. "How do you know that?"

"Well," he said, "they only named three companies, and you were one of them." So, all of that kind of happened by itself, you're right, through networking. I still do that with my current relationships.

JONES: Sure.

PASS: Over the past ten years, seven, eight, years, I've become very friendly with a scientist at the University of Pennsylvania Medical School and we did a couple things together, including my current company.

JONES: Well, I would like to hear about what Bioseeds and Ather . . . . I can come back sometime. Are you in touch with Tony Faras at all? Do you have contact with him?

PASS: Yeah, a little bit.

JONES: A little bit?

PASS: We actually . . . there's a guy that you should talk to.

JONES: Okay.

PASS: You can do that on the phone. He's retired from Monsanto [Company]. His name is Bill, William Peluchiwski. I'll send you the contact information for some of these people. The important thing is Bill did the papilloma virus stuff at Molecular Genetics. On my behalf, he went to the Netherlands for a year to set up Mogen, came back. Eventually when Molecular Genetics broke up, he went to Monsanto and was there for a number of years. Well, he went to Northrup King [Seed Company] here in town first—

JONES: So he was working on the plant genetics stuff too?

PASS: He never . . . in those years he was an animal guy. I don't think he ever worked in the lab. He became an administrator at Northrup King. He may have had a research management job at Northrup King, which became Syngenta [Seed AG] and he wound up actually doing international patent work at Monsanto. But he's a testament—I always said, everything that—every idea I ever had wound up being owned by Monsanto.

JONES: Yeah, well, that's true for a lot of molecular biology and early molecular biology.

PASS: And [E.I.] DuPont [de Nemours and Company]. Some of our people went to DuPont.

JONES: Right.

[END OF AUDIO, FILE 1.2]

PASS: The number two guy at Molecular Genetics stayed at the Human Pharmaceutical company for about a decade and then went back to the University of Minnesota as VP [vice president] [. . .] of agriculture and is semi-retired but is still at the university. I'm actually having lunch with him tomorrow.

I'm in a residents ag[ricultural] company that was founded by two guys I hired in the early eighties and I do a little consulting for them, and I've been on their board for about five years, and they're doing pretty well. They make soil bacteria that are nitrogen fixers in plant growth stimulants. That's going quite well.

JONES: Great.

PASS: Most of the 2000s I was involved in drug discovery so it's kind of moved around a little, then in the last four years I got breast cancer diagnostics.

JONES: Well, what I'd like to do is I'd like to come back to Minneapolis and we can—

PASS: You're invited.

JONES: Thanks. [. . .] What I need to do to come back is I need to line up the other people who are here to talk to them as well.

PASS: Yeah. You can get Tony.

JONES: I can? You think so?

PASS: Oh, yeah, he too is on his second wife, and lives at the end of the Gunflint Trail on the Canadian border about as far away from civilization as you can get.[12]

JONES: Is that by design?

[12] Gunflint Trail is a fifty-seven-mile paved scenic byway in northeastern Minnesota near the Canadian border.

PASS: He's retired from the university. He stayed at the university, he had a full career—headed the university's effort in human genetics for some years, had an active lab, did some more wart work. In a sense, Harald deserved that Nobel Prize because Harald really stuck with it more than we did.[13]

JONES: So you don't begrudge?

PASS: No. Last time I talked to Tony he called me and asked me, he said, "There's a walkway across the university campus where they have plaques for alumni and faculty. And there's one empty plaque for the person who did the most brilliant work that never got credit for it. We want our names to be on that plaque. Do I have your permission to talk to the president of the university?" "Sure." I said. [. . .]

[END OF AUDIO, FILE 1.3]

PASS: . . . grave and made the mistake. He died of coronary artery [disease].

JONES: Yeah, had to attempt to bring fine dining to the area.

PASS: Yeah, we have to grab . . . the buzz about that restaurant's good.

JONES: Good, yeah.

PASS: And I have a foodie guy, he'll be with me in my diagnostic company and he's here.

JONES: San Francisco is the place for foodies, the real—

PASS: And I have some very strong friendships there. In fact, sometime earlier this year I got a call in the middle of the night from my friend, a dermatologist guy in Oakland. There was a party in San Francisco, and he was standing next to John Baxter's widow and wanted to kind of review, because they had been out to dinner with us once.

[13] Harald zur Hausen was the recipient of the 2008 Nobel Prize in Physiology or Medicine for his creation of vaccines for human papilloma virus.

JONES: John just died a year ago or something, right?

PASS: Yeah, until that call I didn't know that he had died. I got the impression maybe it's been two years.

JONES: Maybe, yeah.

PASS: But I'm not sure. So, this is an old neighborhood. [car stopping]

JONES: It's a very nice neighborhood, big houses.

PASS: Yeah, they get bigger as we move out towards Fiftieth Street here.

JONES: Well, compared to if you got to Berkeley, California, you get these little cracker houses, right? You pay a million dollars for a cracker box. If you pay a million dollars in Minneapolis, you—

PASS: No, these houses are selling for two hundred thousand, not that much.

JONES: Yeah, see, what a deal for people from California.

PASS: Let's assume this is Fiftieth.

JONES: I don't see a sign.

PASS: I actually came by here the other day for the first time in a long time. I needed new eye-glass frames from a store; I had to remember where it was. You're warm enough?

JONES: Yeah, I'm fine.

PASS: So, I lived most of my life around here.

JONES: So you're not going to go to warmer climes? You're going to stay?

PASS: I'm going to stay. Last year we had a conversation with the children. We have three boys. At that time they were all living in LA, subsequently one has moved to Chicago last winter. He had become our favorite son.

They said, "Why don't you come out here to LA? Why don't you retire and come out here to LA?"

"No." We built out in the country in 2003, moved in in January 2004. I think it was smart.

JONES: And your wife likes to be—

PASS: Yeah. We've made good friends out there. She's much more social than I am. She never worked since I kicked her out of the lab. I told everybody I married her because she was such a terrible laboratory technician, but she'd go into the union at Einstein and I couldn't get her out of the lab unless I married her. Out here she decided that she had a lot **<T: 05 min>** of free time on her hands and we don't have any income from the current business so why doesn't she substitute teach? They changed the law there and you can substitute teach without a teaching degree. So she does, she subs. She loves it. She has a master's degree in fine arts; she's an artist.

JONES: Does she teach art?

PASS: She teaches art in high school, middle school, grade school, but she teaches anything. She does a fair amount of special ed[ucation] and then stuff that other substitutes don't like to do like music, band, stuff like that, and she'd do that previously.

JONES: Great, so it's a labor of love.

PASS: So, she has a labor of love, more of a textile artist in recent years and she's got a lot of support along those lines out there. I thought the eyeglass place was actually right here but it's not.

JONES: It looks like it's been taken over by a trendy—I don't know what that—is that clothing?

PASS: I don't know what that is.

JONES: Is that clothing? It looks like probably clothing.

PASS: You think so?

JONES: Either clothing or furniture, one of the two. [laughter]

PASS: What does it say on the top?

JONES: Well, it just says—it doesn't say.

PASS: It doesn't?

JONES: Yeah.

PASS: I have to look in this area.

JONES: There's a lot of nice little shops here.

PASS: Yeah, that's an antique area. We have a lot of old-time furniture that we bought in the early, mid-seventies at that end.

JONES: So, Mark Ptashne's neighborhood is somewhere here?

PASS: Is right where we are right now.

JONES: This is it?

PASS: Right over there, about a half a dozen blocks that way. I think he lived on Zenith, and I don't know where we are. He went to Southwest High School, which is four or five blocks to the right.

JONES: I'm trying to get—

PASS: And now we've just moved into the suburb of Edina, [Minnesota].

JONES: Okay.

PASS: What were you saying?

JONES: Oh, I said I need to get to Mark Ptashne for an interview. I've interviewed a lot of the Genetics Institute people, and they all say he's a little difficult. He's got a reputation.

PASS: Yeah.

JONES: Being brilliant but—

PASS: How about Mark Goldberg? Have you talked to him?

JONES: No, is he Genetics Institute or . . . ?

PASS: No. Yes, he was in the business development there for several years.

JONES: Oh, no, I didn't—

PASS: He's an interesting guy. His father, Ray [A.] Goldberg, had an agriculture job teaching ag business at the Harvard Business School, and actually coined the term "ag. business." Ray Goldberg.

JONES: Oh, okay.

PASS: And his son ran . . . one of his careers has been running the Biotech Association [Massachusetts Biotechnology Council] for the state of Massachusetts, and he's a wonderful man who knows a lot of that history.

JONES: Okay good. I've got a lot of names on the recording here.

PASS: He has a venture fund in Boston, the name of which slips me.

JONES: I can look it up; I can Google Ray and that whole deal.

PASS: Yeah. I haven't talked to Mark probably in two years. I hope Ray's still alive; he'd be quite old.

JONES: Oh, Mark has the—

PASS: Mark is the one you probably talked to.

JONES: Yeah, okay. Yeah, I think we're going to do an article on Genetics Institute for the next issue of our magazine.[14] I have to figure out where we can fit in the Molecular Genetics piece.

PASS: Good. Rural art. [reading a sign]

JONES: **<T: 10 min>** So, I should—

PASS: I mean the pharmaceutical thing took years, right? But the company changed its name.

JONES: Did they get a product, yeah?

[14] This publication was called *LSF Magazine* and ran from 2012 to 2015.

PASS: Yeah, take—

JONES: It became MGI [Pharma Incorporated]?

PASS: MGI Pharma.

JONES: And then they changed it to something else, right?

PASS: Well, it got bought by Eisai [Company Limited] for 3.6 billion dollars.

JONES: Oh, okay, a lot of value in it.

PASS: Yes, so yes. Now, did Tony and I have anything in the world to do with that? Absolutely not.

JONES: Well, still it's if you get—

PASS: Let him with a lot of cash.

JONES: Yeah. [laughter] Yeah, so that's something to do with it, you know?

PASS: Yeah, we raised the first money.

JONES: It's got to be gratifying to be part of that whole thing, right?

PASS: Well—

JONES: What it's all become, today?

PASS: Yeah, in that particular instance, I don't know, some of those young scientists had stock and they never sold that stock probably until Eisai bought them out.

JONES: So they got very rich, huh, when the—

PASS: You know what, they certainly made a nice chunk of money. The stock sold.

JONES: In the early days were you handing out stock like Genentech?

PASS: We sure were.

JONES: Yeah?

PASS: Yeah, we sure were.

JONES: I think by the end of the eighties the venture capitalists sort of put a stop that.

PASS: I still use stock options.

JONES: Yeah, but they—

PASS: Not in any way the same way.

JONES: Did the industry change for you over time, become more professionalized or more—

PASS: It didn't, it fragmented. It really didn't hold together so much in my mind as an industry. I think the plant stuff went one way, the pharmaceutical went another way. I don't know. I didn't have great expectations; I didn't feel like we were creating an industry.

JONES: Yeah, but you did.

PASS: We just—

JONES: I mean that's what happened.

PASS: We were just out to amuse ourselves. I remember when we started the company, Tony and our wives went out to dinner one night. Why would we start this company? Well, I needed . . . . Deenie and I, my wife and I, wanted a cabin in Northern Minnesota. Maybe we'd be able to afford to buy a cabin. What do you want, Kathy Faras? She wanted a carpet remnant for her den. [laughter]

That was the extent of our ambition, but we were doing things that we believed in and we thought that you could identify product areas where you could really make an important impact and change. I've kind of never lost that feeling, that feeling.

JONES: So, you're still looking for those opportunities—

PASS: Yeah, I think this cancer diagnostic I'm fussing with is just such an example.

JONES: Well, I'd like to get more of the details of what's the elevator pitch for that.

PASS: Yeah, I can give you . . . yeah, I'm just going out now to try to raise some money for it.

JONES: And is it gene-based?

PASS: No, no, it's just a simple ELISA [enzyme-linked immunosorbent assay] immunoassay that somehow or other got subverted and shelved about a decade ago, and I'm trying to get it off the shelf **<T: 15 min>** and reinvigorated. Your hotel is down that way. I'm going to show you something.

JONES: Okay, are we going to go see the original site?

PASS: Yeah, we will.

JONES: Okay, good, good.

PASS: If we can find it. [laughter] I don't really look for it but it's here.

JONES: Yeah, probably a lot of this stuff has been built up since that time, right?

PASS: I don't know. There's somebody behind us. What's that in there? See, they're doing a lot of building in here.

JONES: Right. Roger Salquist took us to see the—

PASS: The original—

JONES: The original Celgene there and the day we went they had protesters protesting against Monsanto in Davis. They had the Prop 37 thing going on.[15] Is this the park? Does this look like it?

PASS: This is called Parkway Three. I didn't . . . this isn't it, but it looks just like this. This might just as well be it. [laughter] I can try to find it. If anything, you won't know the difference, yeah.

JONES: So it was just a low-rise industrial park building?

PASS: Yeah, and I found a clever . . . 5245, that's empty, isn't it?

JONES: Yeah, do you think this is it?

PASS: Yeah, I mean that's it.

JONES: Okay, great.

[15] This proposition introduced in California in 2012 would require companies to label products containing genetically modified foods. It failed by a very slim margin.

PASS: But its space has been split up.

JONES: I don't have my camera.

PASS: And we built a little mezzanine up there, my office was upstairs, and when we started Bioseeds I came back here and rented it again. I was looking for some space for my diagnostic company last year and I called an agent in Saint Paul, [Minnesota], said that would be a lot closer for me, and it turned out that his brother managed this complex. That was weird, and he knew me. He had met me before.

JONES: Do you remember?

PASS: I had not remembered him but he remembered me. 5245 Edina Industrial Boulevard. So that was it, and we built . . . we had a mouse room in there because we were doing monoclonals.

JONES: Oh, you didn't mention that? What were you—

PASS: No, and so we're not finished with that story.

JONES: Okay.

PASS: Because you're going to meet a guy by the name of Peter Sadowski, who did the monoclonal work. He came as a postdoc from the NIH [Rocky Mountain Laboratories] Hamilton Laboratory in Montana and that was the first commercialization of a therapeutic monoclonal antibody.

JONES: It was animal?

PASS: Yes, it was you fed the monoclonal to cows, calves, newborn calves—

JONES: You fed it?

PASS: Yeah.

JONES: It went through the gastrointestinal—

PASS: Because newborn calves don't have anything to . . . yes, that's why they have passive immunity from their mother's milk.

JONES: Ah, okay, yeah.

PASS: I don't know what that window is but the disease is Scours, it's an *E.* [*Escherichia*] *coli* diarrhea in calves and the product was called Genicol, Genicol 99 because it was K99 *E. coli* and that was really the first and Peter did that.

JONES: Okay.

PASS: And Peter's—

JONES: Is here?

PASS: He's not only here in town but he's the Chief Scientific Officer [CSO] of a company that I started and I'm no longer with that's a public company.

JONES: Okay, well, then—

PASS: And Antares Pharma [Incorporated]. I'll get some of these thoughts down on paper.

JONES: Okay, great, and I'll come back. I'll talk to Peter and—

PASS: Now, Bill Peluchiwski, Bill is only up here in the summertime because he has kept his home in St. Louis, [Missouri].

JONES: I need to go down to St. Louis because I need to go talk to the Monsanto people. I need to talk to Will [William D.] Carpenter, Rob [Robert T.] Fraley, Rob [Robert] Horsch. **<T: 20 min>**

PASS: Yeah.

JONES: There's some others. Those guys, that crew.

PASS: Yes, I remember them. There was a terrific research director at Monsanto, and I can't think of his name.

JONES: Jaworski?

PASS: Yeah.

JONES: Ernie [Ernest] Jaworski? Yeah, he's—

PASS: Yeah.

JONES: I think he's still around so I need to find him.

PASS: He's older than I.

JONES: Is he? Okay.

PASS: He must be over eighty.

JONES: Yeah, I haven't seen an obituary so I need to—I hope he's around because—

PASS: Yeah, he originated a great deal of that vision. Yeah, he's important to you. Mark—

JONES: Frank, thanks very much.

PASS: Thank you.

JONES: Thanks for coming all this way.

PASS: And we'll stay in touch and figure out when we'll next get together.

JONES: Okay, great. Drive safely on the way home.

PASS: Thank you.

JONES: Okay, bye-bye.

PASS: Thanks.

[END OF AUDIO, FILE 1.4]

[END OF INTERVIEW]