

Howard Birndorf

Interview conducted by

Mark Jones, PhD

In 3 Sessions

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SAN DIEGO TECHNOLOGY ARCHIVE



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Howard Birndorf



Howard C. Birndorf is the Founder of Nanogen Inc., and served as its Chief Executive Officer from December 2002 to July 2009. Mr. Birndorf Co-founded Nanotronics, Inc. in 1991 and served as its President. He served as President of Nanogen Inc., from January 2000 to September 2000 and as Chief Financial Officer from December 1997 to July 1998 and from September 1993 to October 1997. Mr. Birndorf was a Co-founder and Chairman Emeritus of Ligand Pharmaceuticals Inc., where from January 1988 to November 1991 he was President and Chief Executive Officer. He was also a Co-founder and Executive Vice President of Gen-Probe Inc., Co-founder and Vice President of Corporate Development at Hybritech Inc., Co-founder and Director of IDEC Pharmaceuticals Corporation, and was involved in the formation of Gensia Pharmaceuticals Inc. (now SICOR Inc.). From November 1991 to January 1994, Mr. Birndorf was President of Birndorf Technology Development, an investment and consulting company, and a founding Director of Neurocrine Biosciences Inc. He serves as Chairman of the Board and Director of FasTraQ Inc. He served as Executive Chairman of Nanogen Inc., from 1993 to August 2009. Mr. Birndorf serves on the board of Hartraq. He was a founding Director of Graviton Inc. and a Director of the Cancer Center of the University of California, San Diego. Mr. Birndorf received a B.A. in Biology from Oakland University and an M.S. in Biochemistry from Wayne State University. Mr. Birndorf received an honorary Doctor of Science degree from Oakland University.

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THE SAN DIEGO TECHNOLOGY ARCHIVE

INTERVIEWEE: Howard Birndorf

INTERVIEWER: Mark Jones, PhD

INTERVIEW: Part 1 of 3

DATE: February 11, 1997

LOCATION: San Diego, California

1 **JONES:** Were you pleased with the story in the New York Times?

2 **BIRNDORF:** You know, one of the things that got left out of that New York Times
3 story was I really talked a lot about my father. It was my father I truly admired, my
4 father was a very rare individual. He was not a shoe salesman, he was a shoe rep. He
5 was a manufacturer's representative for a shoe company, so he sold wholesale to shoe
6 chains -- chains of shoe stores. And he traveled, he made a relatively meager income,
7 yet he provided for our family, and put us all through college -- three boys -- and you
8 know, he went without to do it. He was of that school. My uncle, on the other hand,
9 was a doctor, and I certainly admired him because I saw him in his office, and with
10 his patients, and he was in my young eyes, godlike, in a sense. And he made a fair
11 amount of money compared to my father. He and his family lived a lot better than my
12 father and my family did, although we lived fine. I think I really did want to go into
13 medical school because of him, because of seeing my uncle. But there was a part of
14 me that didn't want to really acknowledge that, so I didn't start out as a pre-med, I
15 started out as a social scientist, a political science major. For two years, I was a
16 political science major. And then I switched my major my junior year to pre-med, and
17 I took, you know, biology, organic chemistry, and whatever you take. And still, it
18 wasn't really turning me on -- it fascinated me, but I didn't really think that I was -- I
19 wasn't particularly turned on by it. I mean, I wanted to be a doctor, but I didn't think
20 I wanted to have to do all the work necessary to be a doctor. And then I had this one
21 professor who really sort of changed my life. I think it started in either my junior or

22 senior year. He was a biology professor, and he took an interest, and I did what they
23 called an independent study with him, and I did my own research, and that really
24 turned me on. Doing something that nobody else had done before, original -- you
25 know, for yourself. And that was very cool. I still talk to him, in fact, I got a letter
26 from him yesterday, and they're giving me an award at Oakland University. They saw
27 the article and they're giving me an award, at both Wayne and Oakland. I'm going
28 back in the summer to get these awards.

29 **JONES:** What was his name?

30 **BIRNDORF:** John Cowlshaw.

31 **JONES:** Is he still there?

32 **BIRNDORF:** Still there. He's a professor there. He sort of really got me interested in
33 science, beyond medicine, I mean just science.

34 **JONES:** So, you're doing an independent study, and you're in the lab, and you
35 enjoyed being there, and...?

36 **BIRNDORF:** Yeah. And it was on viruses, and it was cool, and it was real interesting
37 to me. So, that's when I sort of -- I wanted to go to medical school if I could get in,
38 but I didn't have the confidence that I could get in to medical school.

39 **JONES:** How were your grades?

40 **BIRNDORF:** My grades were average. I had, like a B average, but my test scores, the
41 MCATs were not good, I mean, they were mediocre. I took the Stanley Kaplan course,
42 I did that kind of stuff. I took them two or three times, and they, you know, improved
43 a little bit, but nothing major. So, I was...I did have several chances to get -- one in
44 particular, I was an alternate at Michigan State, for their medical school. And I went
45 and I interviewed, I mean it's a story...I won't even go into that one. But I did not
46 make the cut. I think part of me was actually happy I didn't, because, I really, in
47 retrospect, I'm not sure I would have wanted to be a doctor. I just don't think it was
48 what I really wanted to do. I thought I did though, when I was eighteen years old.
49 Well, actually I was twenty-one years old. So, what happened then? Well my parents
50 had said that they'd put me through undergrad, but that if I wanted to go on further,
51 same with my brothers, and go to graduate school, that I'd have to finance it myself.
52 And that they would help me out, occasionally, you know, a little bit, but not...they

53 couldn't afford to pay for room, board, tuition, all that stuff. So, I applied to Wayne
54 State to biochemistry and I applied for a scholarship. And I received it. I got a full --
55 you know they'd pay -- I got tuition, I got books, I even got a monthly -- a weekly? --
56 A stipend of fifty or seventy-five bucks a week. And so, I went and did that when I
57 graduated, that was in September of '71 when I started in at Wayne.

58 **JONES:** And you decided on biochemistry because of your experience with your
59 professor doing...

60 **BIRNDORF:** Yeah, I really like viruses and molecular biology. That was what really
61 turned me on. And cancer. Well, I did that, I went and started there in '71, and I did it
62 all of '71, and I did OK. I didn't really like it. You know, it was really the elementary
63 classes I was taking -- it was a lot of memorizing, and Krebs cycles, and you know...

64 **JONES:** And not working at the bench...?

65 **BIRNDORF:** Yeah, and I didn't really like it. I didn't really do well at it. I did OK, you
66 know, I kept a B average. And then the second year, I got a job at the Michigan
67 Cancer Foundation, full time, while I was going to school, which did two things: one,
68 it gave me some money, and secondly, I was really excited, interested in it, and it was
69 right down the street, so I could do both. So, and they allowed me to have flexibility,
70 so I could take my classes, and...

71 **JONES:** And this was a job as a lab technician?

72 **BIRNDORF:** Right. In the virology lab. And we were doing really neat stuff, and this
73 guy who ran it was a Jesuit priest named Justin McCormick, who was a really neat
74 guy. Very bright, and I had a pony tail, I was sort of a hippie at the time. You know,
75 he didn't care about any of that. He was really pretty cool. And I was doing that, and I
76 actually made an invention and I tried to get a company to try -- it was BioRad -- a
77 company, I still see the guy who came out to see me about this. It was a method for
78 purifying viruses, and I was using some BioRad stuff in a new way, and I was hoping
79 that they would come and license it.

80 **JONES:** And what put you on to that idea?

81 **BIRNDORF:** I don't know. I don't remember. But I remember calling them, and this
82 guy coming out to see me, and taking me out and buying me dinner, you know, this
83 was like my first science/business thing. And they never called me backed. I was

84 actually pretty disappointed. I thought that...Well, that was '72. And then I got a new
85 graduate advisor, a guy named Bagshaw, who was a molecular biologist, and I
86 changed advisors and went to him, and he was a nice guy, young, was more
87 molecular biology than biochem, we set up a project for a master's thesis. It was
88 interesting. I spent all kinds of hours in the lab. I'd go down and, I liked to work at
89 night when nobody was around, so I could use the equipment, and you know.... So I
90 spent a lot of time....I remember my friends were all pretty much amazed that I was
91 spending so much time down at the lab, but I enjoyed it, I just enjoyed being down
92 there doing my thing, doing my experiments, and...But I never felt myself to be a sort
93 of real creative scientist, I was more of a technical...I could do the technical part really
94 well. Technically, I could...It was funny because somebody went back and repeated
95 my results and they all came out perfect, so I was good, technically. It was in planning
96 and designing experiments, I didn't have the full breadth and scope, in my opinion,
97 now, what was necessary. I'm not saying I couldn't have done it...

98 **JONES:** You didn't really have any interest in doing that?

99 **BIRNDORF:** Well, at the time I probably did, I thought I wanted to be a scientist, at
100 least I thought I did.

101 **JONES:** And so, you're looking down the road....Did you expect that you would follow
102 the typical career path...?

103 **BIRNDORF:** Well, I think in reality, what I really felt was that I didn't know what I
104 really wanted to do. I was doing this, I didn't know if this would be....I looked up to
105 people who were scientists that I read about or met, you know, PhDs who worked at
106 the NIH or stuff like that. But you know, when I think about what I was really doing -
107 - I don't know what I was really doing, if I was really thinking that this was going to
108 be my long-term career.

109 **JONES:** Well, let me ask you this, you had this idea with the BioRad thing. Were
110 other people doing that sort of thing around, trying to commercialize?

111 **BIRNDORF:** Not that I remember.

112 **JONES:** So that was pretty unusual, to do something like that at that time?

113 **BIRNDORF:** I don't remember. Honestly, how long ago was this? This was in '72 or
114 something like that, it's twenty-five years ago.

115 **JONES:** Well, let me just backtrack for a second here, your dad and your family, I
116 mean, what kind of expectations did they have?

117 **BIRNDORF:** Well, I was from a Jewish family. In my family it was always, go to
118 college, be a doctor, be a lawyer. I mean, that's part of the impetus behind my
119 wanting to be a doctor was my family. You know, they said, you can do whatever you
120 want as long as you're happy, but go to school, and become a doctor.

121 **JONES:** And there was never any particular emphasis on business, you know you
122 should succeed?

123 **BIRNDORF:** Absolutely not.

124 **JONES:** It was more professional?

125 **BIRNDORF:** Yeah, professional. Doctor, lawyer, who knows what else? You know, I
126 don't remember them ever pushing me. I went through the sixties, I grew my hair
127 long, I was involved in...I went to Woodstock, I was involved in anti-war protests, and
128 stuff like that. Took a few drugs. You know....you can probably edit that. I was caught
129 up in the times, you know in '68, I was a sophomore in college, it was right at the big
130 time, and I took trips to California, you know, in vans, and did all that stuff. My
131 parent were a little concerned about it, as were most parents, that I was, you know,
132 this hippie, or something like that. And of course, there was a great generation gap at
133 that time between kids and their parents. But my parents were actually pretty good
134 about it. I think the thing that really changed everything was that my father had a
135 massive heart attack in, in '73, September, I believe, August or September. He had a
136 very bad heart attack and he almost died, but they brought him back on the table,
137 and then he was recuperating during the last quarter of '73, and you know, when I
138 think back about it, it didn't seem obvious at the time, but now it seems like, I had to
139 get away, I couldn't stand seeing him like that. It was.... I had come out to California
140 in '70 and '72 on trips in the summer, and I had just finished up my master's, I'd had
141 my orals, my thesis was written, and I was actually doing work beyond that, but I
142 didn't know what I was doing, I didn't know if I wanted to go get a Ph.D., or really
143 what to do, so a bunch of friends of mine had moved out to California because a guy
144 from Detroit had started a business call 'Roots,' do you remember Earth Shoes? Well,
145 this was called Root shoes, and they were....they're still around. They don't do the
146 shoes, but they do leathers. This was an acquaintance of mine, but friends of
147 friends....and these friends of mine had come out to California to open stores at

148 Berkeley, and San Francisco, and Palo Alto, and they all left, and I was feeling pretty
149 alone, and I'll never forget this day. It's absolutely true. I lived out in the suburbs on a
150 lake, renting a house with some people, and Wayne is downtown, and the Michigan
151 Cancer is downtown Detroit, and I had to drive in every day, and I had this old Chevy
152 car, and I'll never forget this -- It was Monday in either late December or early
153 January of '75, early '74 or late '75. My father's heart attack was in '74, not '73, that's it.
154 And I was driving in this big snowstorm, I remember exactly where I was on the
155 freeway, at Wyoming on the John Lodge Freeway. I was looking around, it was
156 snowing, and I was in this horrible traffic jam, and I just said to myself, 'I've got to get
157 out here.' And that was it. I went in. I gave them two weeks' notice at work, I went to
158 Wayne and I told them that I was leaving, and within two or three weeks, I sold my
159 car, I had about \$300, maybe \$400 dollars in cash, one suitcase and my dog. I got in a
160 drive-away car -- you know what a drive-away car is? They pay you a couple hundred
161 dollars to drive a car from Detroit to San Jose. My cousin came with me, and we just
162 took off, and left. I had no idea where I was going, I had no idea what I was going to
163 do, I knew I had unemployment benefits -- ninety-six bucks a week -- for a year, and I
164 really, I was, how old was I? I was twenty- four, just shy of my twenty-fifth birthday.
165 I'd never really been out of Detroit before, except for a couple of trips, and I just
166 decided I was going to leave.

167 **JONES:** Now, at this time, you've got your master's, and you were sort of still there
168 working toward your Ph.D...?

169 **BIRNDORF:** Well, I don't know. I don't even remember, I mean I know I was doing
170 research, but it was sort of like, if I wanted to go get my Ph.D., I'd have to get...I don't
171 remember if I was actually formally in a program, I don't think I was. It wasn't like I
172 was walking away from a formal deal.

173 **JONES:** What was your thesis on?

174 **BIRNDORF:** Well, here it is....

175 **JONES:** What is this?

176 **BIRNDORF:** Brine Shrimp. Brine shrimp are pretty fascinating. They wash up on
177 shore, they dry up, they desiccate, and they sit in these little balls for a thousand
178 years, and then when you add salt water to them, they hatch, they come back to life. I
179 also published a paper, it was in Developmental Biology. Bagshaw was my adviser.

180 James D'Allesio, he was another graduate student. He did very little on that. A little
181 bit of the data, but most of the data is mine.

182 **JONES:** Ever keep track of any of those people?

183 **BIRNDORF:** No, Bagshaw's gone. I tried, I was looking around, because you know, I
184 got this letter from Wayne State, I got all this stuff. They've invited me, I've won this
185 big award, and I've got to go down there. They've been sending me all this stuff. All of
186 a sudden, they saw that New York Times article, and all of a sudden I'm...You know, I
187 never heard from them before that, well...so I'm going down to that. Oakland sent me
188 a thing yesterday, I won this big...I just got this yesterday. So, I drove out to
189 California, I got California, it was like mid-January '75, and these people were all
190 working at these stores, they were making money, they had nice cars, they were
191 renting nice place in Berkeley, so I just sort of hung out with them, took a little time
192 off. Don't forget, I'd now been in school for seven years straight, working, and never
193 had any real time off. So, it was sort of a luxury. I was collecting my ninety-six dollars
194 a week in unemployment. And I helped out, and I got a little pay from them. I started
195 looking around for a job. I applied for several jobs, UC-San Francisco, UC-Berkeley...

196 **JONES:** To do the same the same kind of work you'd been doing...?

197 **BIRNDORF:** Yeah, research assistant. I had several opportunities that I turned down
198 for one reason or another, because I really didn't know what I wanted to do, I think,
199 in retrospect. At the time, I didn't know that I knew that. I took a trip to Hawaii, I was
200 in Hawaii on my twenty-fifth birthday, which was February 1975. I stayed there for
201 about a month, and you know, then towards the end of the year -- I really didn't do
202 much that year. It was a year that forced me to think about what I really wanted to
203 do, and since I didn't know, I ended up getting a job at Stanford, towards the end of
204 the year.

205 **JONES:** And how did you fall into that?

206 **BIRNDORF:** I just went down there, I looked up the employment things, I don't
207 remember exactly.

208 **JONES:** Did you know somebody there?

209 **BIRNDORF:** No. No. Just interviewed and applied for a job. And I got a job in the
210 medical school in the department of oncology with a guy named Frank Stockdale, it

211 was on a government grant, and I was a research associate or assistant, I don't
212 remember what the title was. It paid, I don't know, maybe fifteen, sixteen thousand
213 dollars a year, something in that range. No, it wasn't even that much, it was probably
214 twelve, thirteen thousand. It wasn't very much. I rented a room in a house. I lived in
215 the Palo Alto area. I lived in a house with a bunch of students. Well, first, I rented a
216 room in this really weird house, with this guy who worked at Hewlett-Packard, or
217 something, an engineer, and he had guns...I got out of that because he was really
218 weird. I had my dog with me, so I had to have a place that would take dogs. Then I
219 got into a really neat situation with four or five students, some law students at
220 Stanford, and some other students, so it was like, you know, a student house. And we
221 shared making food, and it was cool. I lived there for like a year. So, I got the job in
222 late '75, and I left there in June of '77. I was there for a year and a half.

223 **JONES:** Where did you go from there?

224 **BIRNDORF:** I came down here.

225 **JONES:** Oh, so you met Ivor Royston while you were there.

226 **BIRNDORF:** Yes.

227 **JONES:** How did you meet Ivor Royston?

228 **BIRNDORF:** Just by chance. I was doing some stuff, Stockdale and our lab had a
229 collaboration with another guy's lab named Ron Levy, who was upstairs, and Ivor was
230 an oncology fellow at the time. He was an MD at Hopkins, and had come out there to
231 train in oncology, and Ivor was in the lab putzing around himself, and we met, we
232 struck up a friendship. I don't remember exactly when we met.

233 **JONES:** What kind of friendship was this? Did you guys see each other socially?

234 **BIRNDORF:** Yeah. I met his girlfriend, I became friends with his girlfriend and him,
235 and then they broke up, but nonetheless, yeah, we became friends. I mean we didn't
236 see each other all the time, but I'd go over to his house -- he had an apartment/condo
237 and, you know, that kind of stuff..

238 **JONES:** And what was he working on at the time?

239 **BIRNDORF:** He was always interested in leukemia and lymphoma.

240 **JONES:** And this is now '77?

241 **BIRNDORF:** Yes.

242 **JONES:** When did you first learn about monoclonal antibodies?

243 **BIRNDORF:** It was some time in '76. This guy, Len Herzenberg had gone to
244 Milstein's lab in the UK and had done a sabbatical there. And he learned the
245 technique. And he came back, I don't remember exactly when, and he was doing this,
246 and I went and learned how to do this from one of his people.

247 **JONES:** You went in and watched them do it?

248 **BIRNDORF:** Yeah, and then I tried to do it myself, and I learned how to do it, and I
249 was working with Ivor, and Ron Levy, and Frank, we were doing all this stuff, and I
250 was one the people who knew how to do this now. I don't remember if Ivor did it
251 personally himself, but me and Ivor were talking about experiments we could do, and
252 what kind of neat things you could do with this technology in terms of answering
253 some questions for science. And you know, Ivor is a very infectious, have you met
254 with Ivor? Ivor is a very exuberant, high-energy person, and this was, you know,
255 twenty years ago, and he was in his thirties, yeah, his early thirties, and he was young
256 and excited and infectious and he really also stimulated my interest, and I was, what,
257 twenty-five, twenty-six, and he was about thirty, thirty-two, I think he's about five or
258 six years older than me, at least. Anyway, we started doing this, and Ivor was sort of
259 wrapping up, and through my time at Stanford, I met some very interesting people.
260 This guy Ron Levy, for example, we ended up doing a company with him later, IDEC.
261 And I met a guy named Joe Bertino, who's a real famous cancer guy, and I later on
262 called him and he got involved in several companies as a consultant, and I met, you
263 know, various people, being around the medical school. And then there was stuff
264 going on there with people starting companies. I remember this guy named John
265 Daniels, who was trying to start a company, I think it ended up being Collagen, Inc.,
266 which is a company that's been around. Anyway, we weren't talking about starting
267 companies or anything like that, we were just talking about science, and

268 **JONES:** You know, Bill Otterson told me this. Tell me if there's any truth to this. He's
269 talking about monoclonal antibodies, and what he said to me was, 'Ivor knew how to
270 talk about them, but Howard knew how to make them?'

271 **BIRNDORF:** That's right. I was the technical guy; Ivor knew how to think about
272 'what could you do with them.' What ones did you want, and why did you want them.
273 And I knew how to make them. That's exactly right. I mean, I was pretty stimulated, I
274 was reading journals, I would go...I was trying to keep up with Ivor, I mean Ivor's a
275 pretty bright guy, and I was trying, intellectually, to get into this, and I think I did to
276 a certain extent. Anyway, Ivor was looking around for what he was going to do next,
277 and he ended up interviewing and taking a job down here as an assistant professor,
278 start-up position, at the U here, and one day he came to me and said, 'How would
279 you like to come with me to San Diego, and set up and run my lab,' basically. And I
280 said, 'Yeah. That sounds pretty good. Interesting. You know, I'd never been here. I
281 had one friend down here, from high school, actually one of my oldest friends. And
282 I'd never really spent any time in San Diego, but I really didn't like Palo Alto all that
283 much. Very sterile, you know, if you had a nice house and everything it might have
284 been nice, but as a starting... a student, if you will....In June of '77, Ivor had a truck
285 that came and picked up his things, and I threw my meager stuff in there, I mean I
286 had very little stuff. I had come down a month earlier, rented a house up I Leucadia,
287 half of an A-frame. I'll always remember that day, oh, I had totaled my car, and had
288 no auto, so I had to get an auto, so I bought this five-hundred dollar green Chevy
289 Vega, and it was really an ugly green, too. And I got into the car with my dog, I still
290 had the dog, and my suitcase, and the rest of my stuff was coming on this truck, and I
291 drove from Palo Alto down here. I remember that drive through the Central Valley,
292 and how hot it was, stopping to get my dog water at gas stations, and I remember
293 getting through L.A. and then coming through Pendleton and seeing the beach and
294 smelling the salt air, and it was really cool. I'd just taken scuba-diving lessons in the
295 Bay Area. I'd had my check-out drive earlier that year and so, one of the things I was
296 really looking forward to was coming down here and diving. And I did, I dove for
297 several years down here. So, I got to my house that evening, I got the key, I got in
298 there, and I was sitting there -- it's right by Beacon's Beach, you know where Leucadia
299 Blvd. and Neptune are, Neptune's the cliff road there, and I lived there for six years,
300 till '82. I really felt I that I was off...

301 **JONES:** You were in the same house until '82?

302 **BIRNDORF:** Yeah, and then I moved into another house in '82, and I've been there
303 ever since. Fifteen years in May.

304 **JONES:** But that was a pretty big jump right. From the one house to the other?

305 **BIRNDORF:** Yeah, but it's still modest compared to my compatriots.

306 **JONES:** Is it?

307 **BIRNDORF:** Oh yeah, Ivor, you should see his place... Well, so anyway, I just thought
308 that I was off on this fabulous adventure, you know. It was the second time in my life,
309 now that I'd moved from what I know to something totally unknown, and it was
310 really just, taking a big risk. Which I didn't- I just saw it as a big venture. And I just
311 loved that. It's cool, it's just exciting to do something totally different, go somewhere
312 you don't know, meet new people, you know, all that. And that's what I did, so I
313 moved in June of '77. It was actually Fourth of July weekend, so I had some time off, a
314 few days, and then we started to work. So I went down to the University and met
315 Ivor, and we had this lab which was no bigger than -- it was probably half the size of
316 this office. It was maybe a two-hundred sq. ft. lab, maybe a little bit wider, but not
317 much.

318 **JONES:** This is at the VA?

319 **BIRNDORF:** Yeah, they didn't have any room. Ivor had to take the least attractive
320 space because he was the new kid, and they didn't have any room, and we were up on
321 the sixth floor, and our lab was literally 200-250 sq. ft. It had lab benches down one
322 side, lab benches down the other, and that was it, we had a hood. And that was it.
323 And so, we had no equipment, no supplies, so my first job was to start equipping --
324 they gave Ivor a start-up budget, you know where you could have some money -- you
325 know you had to write grants, ultimately -- but in the first year, while Ivor was
326 writing his grants and submitting them, they gave him money to buy equipment and
327 supplies, and pay me, and that's what I did. I immediately made lists out, went and
328 got vendors, bought things, put them in the lab, set up the lab, and that was what I
329 did at first, and then, as soon as I could, I started doing experiments.

330 **JONES:** Can you recall what you were working on then?

331 **BIRNDORF:** Yeah, monoclonals. Our whole thrust in this was monoclonals looking
332 at cancer cells -- how to differentiate cancer cells, we did a lot of fluorescent
333 microscope studies, we made monoclonals all the time, that was what I was
334 constantly doing, keeping them up, and...

335 **JONES:** Was any of this stuff published?

336 **BIRNDORF:** I don't know probably not...some of it was probably published, I don't
337 even know if I'm an author. Ivor would know about it, ask him. Anyway, that's what
338 we did. I was there from July of '77 through October of '78, so another year and a half,

339 **JONES:** So, it wasn't long after you got down here that there was maybe an idea for a
340 company in this?

341 **BIRNDORF:** No, it don't think it happened for a while. It didn't happen right away. I
342 was here at least a year before we started thinking that way?

343 **JONES:** And what was it that made you start thinking that way?

344 **BIRNDORF:** I think part of it was, I was getting upset about my income. I kept
345 pushing Ivor about my income. He kept trying to get me more money. And he was
346 trying, as hard as he could. He was paying me some overtime, by this time I was
347 making, I think my salary was fourteen thousand, and with overtime, I was making
348 about sixteen thousand. And I was really trying...you know, I wanted a better car, I
349 wanted something, by then I'm twenty- seven years old, I'm really starting to wonder
350 'what the hell am I going to do with myself.' This is sort of a dead-end job -- I've
351 reached sort of the highest level of research associate, there's nowhere I can go in this
352 without a Ph.D., either I have to go back to school, which was one thing I was really
353 considering, to get a Ph.D. in science or change careers, or do something. We hired
354 several more people in the lab, I was in charge of them, which gave me added
355 responsibility so Ivor could pay me a little bit more, but he was totally bound by the
356 university -- there were salary ranges, and so, there was only so much he could do
357 given the situation. And I think that part of the reason that we came to this whole
358 thing was because of my pushing, saying, 'Hey, I need more money. You know, I can't
359 keep doing this.' So, I think we gradually evolved to this concept, well maybe we can
360 make a business out of monoclonal antibodies. I don't think it was Ivor's idea, and I
361 don't think it was my idea, I think it was a joint...it just sort of evolved, and do
362 believe, in retrospect, that part of that evolution was my always pushing on how
363 could I make more money. You know, saying, 'Ivor, I can't live like this, I need more
364 money.'

365 **JONES:** So, it's your impression that he was happy with his position, his job, and the
366 way things were going?

367 **BIRNDORF:** Yeah, he was on a fast track at the University. I mean Ivor's clearly an
368 entrepreneur -- no question about it, but he hadn't been to that point. He was the
369 head of his school's investment club or something -- he told me that. So, one thing
370 led to another over that year, and I think we first met with Brook in May of '78, so I
371 wasn't even there a year yet, so sometime between the end of '77, it was really after
372 about six months, it was really the first quarter of '78 when we started. We were
373 looking at it like, we could start a little business, Ivor would own a small amount, I
374 would be the major business person, because Ivor didn't want to leave, he wasn't
375 going to leave the university, and he would own a portion and I would work it. We
376 were just thinking that we would make monoclonal antibodies and sell them to
377 researchers. We knew that they might have diagnostic applications, we even knew
378 that they would have therapeutic applications, but our initial idea of a business was
379 not that -- it was really, 'Let's make and sell antibodies for research purposes.' There
380 are companies -- we used to buy a lot of these research antibodies. That was thing
381 that really stimulated this -- we'd buy them, and each batch was different, and they
382 had different immunoreactivity, and we said, 'Gee, we could improve upon this with
383 monoclonals.' We'd set up a little company, it wouldn't be that much money, but we
384 didn't know where we were going to get the money, because I didn't have any money,
385 and Ivor didn't really have any either. He had more money than I did, but he didn't
386 really have any extra. First, we decided we'd write up a little business plan, so Ivor
387 went out and bought this book called 'How to Start Your Own Business.' And he read
388 it, and then he gave it to me, and I looked through it, and he wrote this four or five
389 page business plan. I wrote two sections of and he wrote the rest of it. With this
390 business plan, we tried to figure out who would fund this company. We didn't know.
391 Well, this is to Brook, call it six pages. I don't remember if we made this before we
392 met Brook. I know before we met Brook in May, I went back to Detroit and pitched
393 this to several wealthy friends of my parents, I had friend in Chicago who was a
394 doctor, he had friends who were commodities brokers, and I went and asked them if
395 they would be interested. And this was all so technical and so wild that nobody really
396 understood it. They didn't understand it enough. But basically, this was a follow-up
397 to his letter, it gives an introduction -- what antibodies are -- and we had now
398 expanded our, it's an antibody market, so we were thinking, still, selling antibodies
399 that could be used in diagnostics or blood-banking and that kind of stuff, but this is
400 still the pure antibodies. And we say, well, here's the technical method of producing
401 hybridomas, and then we have the background of the founders, and then we had -- I

402 wrote these two sections -- the market analysis and the competition section -- and
403 gave them.

404 **JONES:** Now looking back at this now, do you think you had an idea of what you
405 were doing?

406 **BIRNDORF:** No, well, it was all right. Then, patents, we talked about, start-up
407 capital, staff -- which, the first year, would be headed by me, who'd be fully
408 employed, you know, there was our operating budget. We wanted \$178,000 for the
409 first year.

410 **JONES:** Is that how much you were asking for when you went back to Detroit and
411 Chicago.

412 **BIRNDORF:** Yeah. And you know, my salary -- I was going to get a \$5000 raise to
413 \$20,000. And we had all these technicians. It was me and six other people total. Of
414 the \$178,000, \$100,000 was personnel costs, we needed \$25000 for supplies, we needed
415 \$22,000 for rent.

416 **JONES:** Where did you think you would locate it?

417 **BIRNDORF:** We actually found a place in the La Jolla Cancer Research Foundation
418 that was for rent, and then equipment, so it was a very meager budget -- pretty tight.
419 We had Hybritech, was the name, and equity and then there was a little analysis at
420 the end. And so, that was the first business plan, and I'd taken it around and nobody
421 was interested...You can turn this part off [tells about Colette Royston having dated
422 Brook Byers; this embarrasses Colette]. So, we have with this meeting with Brook,
423 and then he came down to San Diego, sometime after May 8th, and I don't remember
424 whether he came down with Tom Perkins the first time, or if he came down alone. I
425 think he came down alone the first time, and then he brought back Tom Perkins, but
426 anyway, Brook was, I don't know, let's see, Brook's fifty-one, now, so this was '78, that
427 was nineteen years ago, so fifty-one, forty-one, thirty-two. He came down with Tom
428 Perkins.

INTERVIEWEE: Howard Birndorf
INTERVIEWER: Mark Jones, PhD
INTERVIEW: Part 2 of 3
DATE: March 10, 1997
LOCATION: San Diego, California

429 **BIRNDORF:** I remember Tom Perkins, and we took them on a little tour of our little
430 lab, and then we went and we had a meeting -- we took them to the airport, and we
431 sat in the bar at the airport, and Tom Perkins offered us three hundred thousand
432 dollars to start the company, which was a hundred and twenty-two thousand dollars
433 more than we were asking for -- so, the first and last time anybody ever offered us
434 more than we were asking for. And then we talked about who, the percent
435 ownerships. It was going to be seventy percent for Kleiner-Perkins, and thirty
436 percent, no, I forget, yeah, thirty percent for us, and Ivor got the lion's share of that.
437 I ended up with five or six percent, I really don't remember. I was pretty upset about
438 it because I thought that since I was the one that was leaving, Ivor was the one that
439 was the M.D., he had the credibility, I was just this lab tech. In retrospect, it was
440 pretty unfair. But, I didn't really have a lot to say in the matter. I was sort of locked
441 in, you know. I didn't have a choice -- it was either do it or don't do it, and I didn't
442 know what leverage I had at the time. I didn't feel like I really had much, although
443 probably I had more than I thought I did. I remember calling Brook in New York and
444 debating this with him over the phone, and I think I eked out one more percent but I
445 still got a lot less than Ivor did. A lot less. He got three times as much as I did.

446 **JONES:** Had you discussed this with Ivor before, when you talked about starting the
447 company?

448 **BIRNDORF:** Yeah, we did. And it was funny how things changed as we got closer to
449 it being a reality. At first Ivor said, I'll just take ten percent, you take ninety percent,
450 because you're going to go do it. And then, as we got closer, it was, 'Well, let's do it
451 fifty-fifty.' And then, when we got to the airport, he sure didn't argue, or say that we
452 had a deal fifty- fifty. He let it go, and I was really angry with him at the time. I was
453 pretty perturbed about it. I said, 'Hey, you said fifty-fifty, and now it's, you know,
454 you get this, I get this.' But he didn't budge, and I didn't have a whole lot of leverage.
455 I was making fifteen thousand dollars a year with a master's degree, I did not have

456 the leverage to do it. I don't remember when this was, exactly, it was the summer of
457 '78, and then, I remember another meeting where Brook brought all of his partners
458 down, and we met at the La Valencia Hotel for lunch, and it was Gene Kleiner and
459 Frank Caufield and Tom Perkins and Brook, and we had a lunch with them, Ivor and
460 I. And then they were going to go hire some consultant to do due diligence on this
461 whole thing, and they did that. I don't remember the name of the consultant now;
462 they hired some guy, and he went off and did some sort of report for them on where
463 monoclonal antibodies could fit in, and what they could be in the industry, and then
464 we had a meeting up in San Francisco. Actually, the consultant was going to give his
465 report. It was the day, it was October 18th, 1978. It was the day we were going to do
466 the closing setting up the company, and in the morning, the guy was going to give
467 his report, and in the afternoon, we did the closing. This is the closing book. Let's see
468 -- it was three-hundred thousand -- they bought a dollar a share, three hundred
469 thousand of preferred, and Ivor and I got one hundred and fifteen thousand, of
470 which, I got thirty thousand, I believe, so he got eighty-five thousand, and I got
471 thirty thousand. Anyway, they did a five to one split. It wasn't reversed, it was a
472 forward split. It was a split, a real split. They just took all of the shares and
473 multiplied them by five. Anyway, so this guy gave his presentation in the morning,
474 and basically what he presented was that these things in not just research, but also
475 in diagnostics and therapeutics. You saw the little business plan we wrote. We said
476 they would be useful in diagnostics and therapeutics, but we were proposing,
477 initially, just research products. And basically, he saw that these would be very good
478 in diagnostics and/or therapeutics, and then that afternoon, we did this closing, the
479 legal closing, in the offices of Pillsbury, Madison, and Sutro. Tom Sparks was the
480 attorney that they had chosen. We also picked the law firm for patent law -- Lyon &
481 Lyon -- and Tom Kiley...we were doing a lot of work down here, I'm remembering
482 back now, we used to meet at Ivor's house, off hours, and Brook came down several
483 times, and was helping me do budgets, and figure out what we needed -- no that was
484 after, I'm sorry, I'm getting ahead of myself. My memory's not that good. Let's see.
485 We did a little bit of that before the closing. Then after the closing, they handed me
486 a check for three-hundred thousand dollars, and I flew back to San Diego, and I had
487 this crummy old car, and I drove from the airport, and I ran out of gas on the way
488 home, and I had this briefcase, I was clutching it, I had this three-hundred thousand
489 dollar check in there. It was more money than I'd ever seen in my life. And Brook,
490 the thing about Brook that's so fantastic is, he lets people do things that they've
491 never done before. So like, he gave me this money, and I went and set up this bank

492 account at B of A, and went in and just met this woman named Martha Demsky, who
493 was an account executive there, and we set up this account with this three-hundred
494 thousand. We had invested it, you know, like you do. I didn't know anything about
495 this kind of thing, and Brook was helping me, sort of being my mentor on this. We
496 had a number of meetings at Ivor's house with Brook and Tom Kiley, who was at
497 Lyon & Lyon, who subsequently went to Genentech. And when he went to
498 Genentech, they gave us a guy named Larry Respass, who then worked with me for
499 fifteen years. He was with me at Hybritech, Gen-Probe, and Ligand, and he's still at
500 Ligand. So, we had this report by this guy, it was very good. We did the closing, and I
501 came down and started the bank account, and the next day was my last day at the
502 VA, at the University, and we leased space, and we moved into that space. My last
503 day was a Friday, on the following Monday, I went and it was just one lab that was
504 empty, just lab benches, you know, and an office, and I got a desk, and a phone, and
505 that was it. And there I am, it's a Monday morning, I'm in my new office, I've got a
506 phone, and nothing else. I had the phone put on, I had the lease done on the space, I
507 did all this stuff, while we were waiting, you know, we got the thing done, and I was
508 ready to go, and I went in there and I immediately started ordering equipment and
509 started interviewing people. We found out that there was this guy that might be
510 interested in a job, a real bright guy named Gary David. I started interviewing him,
511 and Brook interviewed him. Brook was acting president; I was vice-president, and
512 Ivor was consultant. So, we did that, and I started hiring people, and ordering all this
513 equipment and stuff...

514 **JONES:** How did you hear about Gary David?

515 **BIRNDORF:** I don't remember who told us about him. Somehow, through the
516 grapevine we heard about him. He was at Scripps, yeah, I believe. [Actually, he had
517 already left] And, he came on board. He was one of our first employees.

518 **JONES:** What were your criteria for hiring people then? Did you have an idea of
519 exactly what this guy was going to do?

520 **BIRNDORF:** I don't remember that we knew exactly what he was going to do, but
521 he had the right background. He was in immunodiagnostics, he knew a lot about
522 antibody assays, that kind of stuff. He was not commercially oriented at all, I mean
523 really. And he ended up staying at Hybritech until just about a year ago, or a couple
524 years ago. So, he was there for almost twenty years, eighteen years or something. I

525 remember hiring a bunch of people. We got up to about eight or nine people by the
526 end of the year, so between October and the end of the year. I took my first business
527 trip in December of that year, with Brook. We went to the East Coast, and went to
528 Merck and various...we went around to some different places looking to...we wanted
529 to talk to Merck about giving us access to hepatitis B surface antigen, so we could
530 make monoclonals against it, and we went in there and talked to a guy named Bill
531 Macalear, and another vice-president there, who's name escapes me. He was a real
532 crusty old guy, what was his name? Anyway we couldn't get it from them, they
533 wouldn't give it to us, but I found a way to get it from somebody else, and we got it,
534 and that was our first demonstration, and actually, I did those fusions myself, because
535 there was nobody else to do it, and it worked. Out of our first experiment we got
536 monoclonals that were very specific to hepatitis B surface antigen. And this was all in
537 the fourth quarter of '78. By the first quarter of '79, we had antibodies. So, we were
538 moving along, and Ivor was coming over, and you know, consulting, and he'd come
539 over, I don't remember once a week or twice a week, or whatever. We were trying to
540 hire people, and then, we were looking for a president. They had told us that neither
541 Ivor nor I would be president - that we would have to bring in an industry guy to be
542 president.

543 **JONES:** Kleiner-Perkins said that?

544 **BIRNDORF:** Yes. They said it right when they did the deal. They made it very clear
545 that neither one of us had the background nor expertise to be president, and we
546 agreed. I mean, I think we agreed. So, I was this vice-president, basically, of
547 everything, and I was effectively the COO. I was running it all and then, somehow,
548 Ted Greene got contacted, or they found out about him, I don't remember how they
549 found out about him. Tom Perkins brought him in, and he had been thinking about
550 setting up this company called Cytex or something, that was going to be a
551 monoclonal antibody company. So, we figured we could do two things by hiring him,
552 one, kill a competitor, and two, get a seasoned -- he was a Harvard MBA, he had
553 worked at Baxter-Travenol, he was a McKinsey consultant -- that we could get a
554 seasoned industry guy. He was about, at the time, about thirty-five. I was twenty-
555 eight. He must have been thirty-nine. And so, this was during the first quarter, we ended
556 up hiring him, and he came aboard March 1st of '79. He was acting president. I was
557 running the day-to-day stuff. Ted came in as president and CEO. Brook stayed
558 chairman, and Brook was chairman until the end. He was always the chairman of the
559 board. Now, that's the other thing: Ivor also went on the board. The board was

560 Brook, Ivor, Tom Perkins, and Ted, initially, once Ted came on board. I didn't get to
561 go on the board, which was also something that I was a little perturbed about. But,
562 then Ted came on board, and we really stepped up, we were running out of money,
563 we didn't have a whole hell of a lot of money, so we then did another round of
564 financing and we brought in Sutter Hill, Dave Anderson, and he went on the board,
565 and we brought in who else?

566 **JONES:** Is that when Pitch Johnson got in?

567 **BIRNDORF:** Pitch Johnson, Asset Management, and he went on the board, and who
568 else? I think that might have been it. I don't remember really who else we brought
569 in, and I think we raised about three and a half million dollars total. And then, we
570 helped write a business plan. Ted wrote his first business plan then, which I have a
571 copy of somewhere. Anyway, so we raised this money, and we started hiring people.
572 One of the things that Ted did was he knew Tom Adams from Baxter, Tom had
573 taken a job at Technicon, which was on the East Coast, he had just moved from here
574 to the East Coast, and Ted managed to get him recruited, and he came on board at
575 the end of '79, I believe. We were expanding, we were taking over more labs within
576 La Jolla Cancer Research Foundation. I got permission to put a trailer, an office
577 trailer in the parking lot, from the city, because we were having such growing pains.

578 **JONES:** No problem with the city, they receptive to that?

579 **BIRNDORF:** I don't even remember, I think they were...I don't remember. We got it
580 done, though. Anyway, we hired Ron Taylor as head of operations, Jim Jungwirth as
581 CFO, Tom Adams as head of R&D, Paul Rosinack as VP of sales and marketing. This
582 was over time. Who else? David Hale came on board in 1981. Dennis Carlo came on
583 board in 1980-81, therapeutics. We expanded the team out, Tim Wollaeger replaced
584 Youngworth as CFO, and Hale brought in Cam Garner at some point in the future.

585 **JONES:** What was the process of recruiting these people? Was it easy to get them to
586 come?

587 **BIRNDORF:** No, it wasn't easy because we were, you know, this little rascal start-up,
588 big plans, but you know, we were running out of money again. I remember we raised
589 seven and a half million from Hillman Company, and they went on the board, a guy
590 named Steve Banks. This was now like '80-'81. I think it was one of those rare
591 situations where we really had a group that clicked. There was a magic at Hybritech

592 that I've never seen since at any of my companies to the extent that it was there, I
593 mean, I've seen some of it, but we used to have TGs every Friday, and it was a rare
594 mix of people that all clicked pretty well together. The lower level people, the mid-
595 level people, and the upper level people, all started clicking, and there was this real
596 sense of urgency there, there was a collective sense of us against the world there. It
597 was really quite a magical place. It was a blast. I mean we had the best times. I sort of
598 found -- you know, water seeks its own level -- I sort of found my niche, you know,
599 first I was VP of everything, then he'd [Greene] hire R & D, and then I was VP of
600 everything except R&D, and then he'd hired finance, and then I was VP of everything
601 but finance and R&D, and then operations, so I sort of found my niche with
602 corporate development. I started going out and in-licensing antibodies from other
603 places, other technologies from other places, and talking to other companies about
604 doing corporate development, you know, corporate deals with us, so I started
605 traveling a lot. I don't remember what year it was, maybe 1980, I traveled some thirty
606 weeks out of the year, I mean I was really...I had one six week trip to Europe, I
607 remember. So, I started going all over the world, and this was great for me. I had
608 never been to Europe, I had never been to Japan, and all of a sudden, I'm off on these
609 trips, and the first trip I took to Europe was this really long trip. I was there for
610 weeks and I was there alone. It was really cool. You know, in time, the travel
611 becomes much less attractive, as you get, you know...but for me, this was wow!, this
612 was the coolest thing. And I was also in charge of our scientific advisory board, and I
613 would get them all together. I would plan the meetings and things like that.

614 **JONES:** What would they do?

615 **BIRNDORF:** Well, we had our first meeting in La Costa. I don't remember what year
616 it was, probably about '79 or '80, and we brought in, we had this group of SAB guys,
617 and Brook came, and I was there, and our scientists were there, and we had like a
618 two day meeting, and we had a banquet, and it was just a blast. We told jokes, I'd get
619 up and tell a joke, and it was just a lot of fun.

620 **JONES:** And none of the companies you've started since then have been quite the
621 same?

622 **BIRNDORF:** No, I don't think any one of them has been the same level. They've had
623 magic, some of them more than others, but Hybritech had a star of its own. I've
624 never seen anything like that.

625 **JONES:** Do you think that has something to do with the times? It was just so new?

626 **BIRNDORF:** I think part of it was that, yeah, part of it was that we were new, we
627 were the first biotech company in San Diego, really. I mean there were a couple of
628 other minor things going on here, but...we were growing in leaps and bounds, we
629 were pushing to get a product out on the market, and we got our first product on the
630 market in, I think it was '81, IGE, and...

631 **JONES:** And what was that exactly?

632 **BIRNDORF:** It's a test for allergy. It's a general test to see if you come in with
633 symptoms of a cold, say, they can take your blood and say, 'Ah, there's IGE in your
634 blood. That means you're having an allergic response, it's not a virus, or, you
635 know....Quite a few. I don't remember them all. CK-MB, this and that, we made
636 inventions -- this TANDEM assay invention, that was a big patent lawsuit that we
637 ended up winning.

638 **JONES:** And you used that for most of these products?

639 **BIRNDORF:** Yes.

640 **JONES:** And when was that patented?

641 **BIRNDORF:** In '79.

642 **JONES:** That early?

643 **BIRNDORF:** Yeah, '79. Ted's an inventor on that, and Gary David.

644 **JONES:** And Tom Adams, right?

645 **BIRNDORF:** Tom Adams wasn't even there yet, when that was filed. Tom Adams
646 made a number of improvements to it, but I don't think Tom was there when the
647 original concept was developed. I could be wrong about that. That's right, don't
648 forget that we were funded on technology that was non-proprietary. Monoclonals
649 antibodies could do it with immunity, basically anywhere in the world, because
650 Kohler and Milstein didn't patent it, and it was fundamentally public domain
651 technology. And there were start-ups that popped up, Monoclonal Antibodies, Inc.
652 started up, and others, Centocor started up, so you had to establish a proprietary
653 position of some sort. And we did it in assay technology, and in proprietary antigens,

654 there are proprietary antibodies -- I went out and licensed antibodies from Harvard,
655 from here, from there. You know, that's what I was doing a lot of, getting antibodies
656 in. And we actually were selling antibodies at one point, a research mode, you know,
657 to try to get some revenues.

658 **JONES:** So, you did this before you got the first big money, the first three million?

659 **BIRNDORF:** You know, I don't remember, I honestly don't remember. I think it was
660 probably after. Somewhere here, let me see if I can find that. We made our first...we
661 were going to sell hepatitis B surface antigen, and I was sort of in charge of putting
662 this all together, somewhere I kept this, I saw it the other day. I printed out the
663 labels and spelled hepatitis wrong. I kept some of the labels of this just to save a
664 memento of those years. Here was one of the first Kleiner-Perkins brochures when
665 we first did the thing with them. I've got stuff on napkins...Here was a Gen-Probe
666 napkin, I've got some other napkins here from other companies. Progenx business
667 plans....Here's the business plan, joke, joke, joke, hunting trip, joke, over the years,
668 I've collected these jokes that I fax...Here's a review of that book in the Wall Street
669 Journal...Brook sent me this a long time ago....Here's the original Gensia business
670 plan

671 **JONES:** You were on the board there?

672 **BIRNDORF:** Yeah...Here, I gave a talk, they called me doctor at Stanford...Here's the
673 Gen-Probe start up thing...another thing about me, when I left Gen-Probe. This was
674 Ligand. This is the original document from Ligand. I had a bunch of photographs
675 from the early days...but I can't find them, unless my secretary has them. I have this
676 whole folder full of photographs.

677 **JONES:** Now, you're VP of corporate development, making all these deals, adapting
678 to life as an executive. What was that like that, learning that process? Did Brook help
679 you with that a lot?

680 **BIRNDORF:** Well, he helped me in the early days, you know, I was never really good
681 at taking order. One of the problems that I've always had is that I resist authority,
682 you know, part of it is, I think I can do it better, which may or may not be true, but
683 I've always been tough to manage. Ted Greene and I were always butting heads.

684 **JONES:** Do remember over what?

685 **BIRNDORF:** I don't remember specifics, but we never saw eye to eye. I didn't really
686 like working for him. I tried to be a team player; on the other hand, I didn't
687 personally like it. So, you know, I did it from, he came on in March '79, '80, '81, it was
688 just very busy, but he and I did butt heads about things. One of the problems was, I
689 came on at a very low pay. I started at twenty-thousand dollars, and then he'd bring
690 these guys on at sixty, seventy, eighty, ninety thousand dollars, but I'd never catch
691 up. I'd get these little raises and I was real resentful that I was doing the same work
692 as everybody, but I wasn't getting paid. So, I had a lot of problems with him about
693 that, about my pay, I was real money conscious. I remember, I bought my first new
694 car, actually I had bought one when I was younger, a VW, but this was my first new
695 adult car, a Honda Accord. I bought in, it must have been about '80. And I used to
696 pick Ted up at his house, sometimes, and we'd drive in together, and stuff. I
697 remember talking about Japanese cars, and stuff like that. Anyway, it was a real nice
698 little car. The first time I had a decent car. Anyway, we butted heads, and things
699 were getting bigger, and then we had a therapeutics division, and a diagnostics
700 division, and we started having all these meetings with companies like, we had these
701 big meetings with Merck, we thought Merck might want to buy us, and we had all
702 these big high-level meetings, and then of course, Lilly came after I left, but I just
703 started getting disenchanted with my role. I wanted to have a more active say in
704 things. You know, I wanted to do my own thing really, so in '83, I believe, is when
705 Dave Kohne came over to Hybritech to show us this new technology that he had
706 developed, this ribosome RNA thing, and Tom Adams and I believed that it was
707 something worthwhile, and we went to Hybritech and said, 'You should do this.' And
708 the decision came down, 'well, we're in antibodies, we shouldn't be in probes, it's too
709 defocusing,' that kind of thing. Probably the right thing, so we petitioned the
710 company to see if we could go do this ourselves. We went to the board and basically
711 they said, OK, and they actually invested in it, as it turned out, in the final analysis. I
712 think they put two million dollars into it, and Adams and I went...I left, I think May
713 1st, 1984, was my first day at work at Gen-Probe. That was really tough leaving
714 Hybritech, really tough.

715 **JONES:** Because it was your baby?

716 **BIRNDORF:** Yeah, that was really the toughest thing I ever had to do in corporate
717 life, was leaving that company.

718 **JONES:** How much of this was finding a new technology that you thought should be
719 developed, and how was it simply getting antsy to get out and do something on your
720 own?

721 **BIRNDORF:** Well, it was big risk. I was with a good company. I was already a
722 millionaire. At some point, Hybritech went public, and Dennis Carlo always tells this
723 story about how we were flying back from the East Coast or something, we were on
724 the plane, and all of a sudden, I got up in the middle of the plane, and I started
725 pacing back and forth up and down the aisle. And he said, 'What's going on? What
726 are you doing?' And I said, "I just realized I'm a millionaire." It was on paper, of
727 course, but it was the fact that, all of a sudden, my stock was worth something, I
728 don't know what it was, a million and a half dollars or something like that, and I was
729 nuts. I mean, all of a sudden, it just hit me that my dream had come true, I was a
730 millionaire before I was thirty years old, and it just blew my mind. It hit me, the
731 realization that I had a net worth of a million and a half dollars or whatever it was.

732 **JONES:** So, had did that change your life in practical terms?

733 **BIRNDORF:** I bought a house. I had been living in this A-frame for six years in
734 Leucadia that I rented when I first came down here with Ivor. I rented the
735 downstairs for five years, and finally the people move out upstairs, which was the
736 nicer unit, and I was there for six years. I bought the house I'm in now -- I've been in
737 the same house now for fifteen years, in two months -- I bought that in 1982, in May
738 of '82. And it was much more money and far bigger than I had ever intended to do,
739 and I sold some stock, and I bought this house. So things really did change for me. I
740 bought a BMW, you know, I was becoming a consumer. And part of my motivation
741 always was, really, to achieve some financial success.

742 **JONES:** And then after the first million, you retained the drive to make more?

743 **BIRNDORF:** Yeah. What's enough? I mean, I don't know. I'm still driven by that, by
744 making money, I'm still driven by having toys and nice things. It's not as much
745 anymore, though. It's different. How cars can you have? How many houses can you
746 have? It's not the same anymore. I really do the things I do now because I really like
747 them, and because it's still a real thrill to put something together and get it to work,
748 and get the money, and the people, and the deals, and everything, and get public,
749 and that really is personally what motivates me now. The money is nice, and it
750 comes, but it's not the same as it was then. But that's one of the reasons I did Gen-

751 Probe, was Hybritech was public, I was not getting much more stock, I felt really
752 like...at the time, they had this thing where you could do what they called a junior
753 common stock, so we did this thing that was called series C common or something
754 like that, and I got like fifteen thousand shares of this thing. It wasn't very much. I
755 remember that there were x number of shares, and everybody got a little piece, and
756 Ted got the huge piece, and I was pretty perturbed about that. It just didn't seem like
757 I could any farther, really. I had what I had at Hybritech, and that was really all that I
758 was ever going to get. I'd get little pieces, but...and I was making, not even a hundred
759 thousand dollars a year then. My salary was low, so part of it was also money
760 motivation, to make more money as salary, and to now start...I saw what I could do
761 at Hybritech in making, it wasn't just me obviously making that stock worth money,
762 but the fact that I had started the company, received founder's shares...One of the
763 mistakes I made, in my opinion, is that throughout, up until this company, really, at
764 Hybritech, at IDEC, at Gen-Probe, well, Gensia, I never worked at, I just helped put it
765 together and was on the board, same with Neurocrine, I just helped put it together
766 and was on the board, Ligand was another mistake -- I never put my own money into
767 it. I just took founder's shares and then shares for being an operating person, and
768 even though I made a lot of money, I could have made a lot more if I had put my
769 own money into it?

770 **JONES:** You just didn't want to put it at risk?

771 **BIRNDORF:** Well, I guess so, I just always was under this 'use other people's
772 money,' and get what you can get on the cheap, but people have asked, they say,
773 'Look, you've made all of these successful companies, why aren't you up with Bill
774 Gates,' I mean not that much, obviously, but 'why aren't you way up there?' And it's
775 because I never did risk my own money. I never felt like I was comfortable enough to
776 do that because I didn't think I had enough. I was always worried that, you know,
777 part of my...my own insecurities where I needed to keep something in the
778 background. And this company, I've risked a lot of money in, and if it hits and we go
779 public, I'll make a lot more than I've made in any of the other companies. We're
780 being wooed right now to make a public offering, you know, I don't know if we'll
781 make it this year, but hopefully we will.

782 **JONES:** Well, was Ivor involved with Gen-Probe?

783 **BIRNDORF:** No.

784 **BIRNDORF:** Then I started Gen-Probe with Tom Adams and Dave Kohne. Dave
785 Kohne was the scientist who had the technology. He was at various places. At the
786 time we met him, he had his own little lab, but he had been at Scripps and Salk. But
787 then, we started IDEC, Ivor and Bob Sobol and I put together a business plan, and I
788 worked with Bob Sobol, who's an MD who worked with Ivor at UCSD, and we put
789 together this plan and we took it to Brook, and Brook funded it, and then we
790 merged it with another company and that is what IDEC became today. IDEC's doing
791 really well, I was on the board for the first five years, and then I left the board, but I
792 never -- [checks the NASDAQ sticker on a laptop] 27 5/8 this is near one of its all-
793 time highs, it's doing really well. Ivor and I were involved in that, and both he and I
794 were on the board there. Now I was qualified to be a board member, and I was on
795 the board for five years. He was on the board for I think six years. He's not involved
796 with them anymore, either. I was not an employee of IDEC, either. And neither was
797 he. He was on the advisory board. But then the rest of the companies, Ivor was not
798 involved with, not to any great degree.

799 **JONES:** So, how did you start Gen-Probe? There were the three of you, and you're
800 using your experience from Hybritech -- this is how you do it?

801 **BIRNDORF:** Yeah, sort of a cookie-cutter formula. We went and did it, and Gen-
802 Probe was a very tough technical challenge. Tom Adams was, you know, the
803 president, and I was executive VP. I went on the board, and he went on the board,
804 and we got other board members, and Brook was on the board, and then we ended
805 up selling that company to Chugai in '89.

806 **JONES:** I want to get in touch with some people at Stanford, you mentioned Len
807 Herzenberg....

808 **BIRNDORF:** Yeah, he's still there, but I didn't really know him. Ron Levy's still
809 there. I worked sort of in his lab, and he's the guy who had the other company that
810 we merged with IDEC, Biotherapeutics, Inc., or something like that. I don't
811 remember. Ron Levy. Frank Stockdale, who I worked for is still there, and I see him
812 occasionally, when I go up there.

INTERVIEWEE: Howard Birndorf
INTERVIEWER: Mark Jones, PhD
INTERVIEW: Part 3 of 3
DATE: April 11, 1997
LOCATION: San Diego, California

813 **BIRNDORF:** Ivor and I hired a lab tech that worked for me in 1978, I guess, late '77,
814 early '78. He was a real holier-than-thou kind of guy, and he went to Ivor and told
815 Ivor that I wasn't working hard enough, and this and that. I remember this big
816 confrontation in Ivor's office. He accused me of coming in late or something, and I
817 turned to Ivor and asked, 'Is everything getting done?' And Ivor said, 'Yes.' So I said,
818 'I rest my case.' So nothing happened, but he tried to undermine me -- he was a real
819 jerk. Anyway, we went off and started Hybritech, and then in '79 or '80, he shows up
820 one day at Hybritech with an attorney. He told us that he thought we had stolen
821 things from the university, technology or cell lines. I don't even remember what it all
822 was. There was this one T-cell antibody that we were trying to work on, and we had
823 a deal with the university. We were talking to the university about licensing it, or
824 something, I don't remember, but he didn't know that. And he basically threatened
825 that he would go to the university and tell them if we didn't give him money. So, we
826 basically told him, 'Take your best shot,' you know. He ended up marrying Ivor's
827 secretary and then went to medical school. Then about ten years later, he was trying
828 to do a residency in radiation oncology, and my good friend, Stanley Order, who was
829 the head of radiation oncology at Johns Hopkins, called me up and said, 'Howie,
830 there's a guy here that's applying for one of the two residencies, it's a very prestigious
831 position.' He said, 'There's lots of applicants and we only take two positions a year.
832 This guy looks really good, but he says he worked in Ivor's lab, but he doesn't list you
833 or Ivor as a reference. Do you know the guy?' I said, 'Stanley, do me a favor, will you?
834 Blackball him.' And he did. And I said, 'Try to let him know that it comes from me.'
835 Revenge is always a dish eaten better cold. The guy was clearly sour grapes or
836 something. After he did that thing with me, all of a sudden Ivor calls me and says,
837 'Come down to my office.' I go down to his office, and there's John sitting there, and
838 he never came to me personally, he wasn't man enough to do that. And then he tried
839 that, I call it extortion for lack of a better term, but that's what it was. We told him,
840 "Go ahead, do what you have to do. We didn't do anything wrong. We didn't steal

841 anything, and if that's what you think, go ahead. Go to the university.' And nothing
842 ever came of it. It's funny you know, when things are successful, people come back
843 and...I mean, I'm still in a lawsuit, I'm being deposed next week for Gen-Probe, about
844 some little thing here, Center for Neurological Studies, claims that the Kohne patent
845 was really developed on their dime, and they have a right to it, and they want all this
846 money, and stuff. You know, this is almost fifteen years later, thirteen years later, or
847 something. They didn't come in thirteen years. They claim they didn't know about it,
848 but

849 **JONES:** When you learned of David Kohne's technology, he had this patented
850 already?

851 **BIRNDORF:** I think he had applied for a patent, yeah.

852 **JONES:** He came and gave a talk at Hybritech?

853 **BIRNDORF:** No, but you know, this is all subject of a law suit right now, so I really
854 can't talk about Dave Kohne, and this whole thing, because I'm being deposed, and
855 all this stuff, and the last thing I need is for something to come out in some public
856 document. So I really would rather not talk about Dave Kohne and the originations
857 of Gen-Probe until all this is settled.

858 **JONES:** OK, well maybe we can talk just in general terms. When you did meet Dave
859 Kohne...

860 **BIRNDORF:** Dave Kohne came over, and we met him for lunch, he was just...let's
861 skip this part.

862 **JONES:** Maybe sometime down the road?

863 **BIRNDORF:** Yeah, because this is exactly what all the lawyers are trying to figure
864 out -- when did I meet Dave Kohne, and, you know, I have my own recollections,
865 and they're my recollections, what I think is the truth, and there are all these people
866 saying that Tom Adams met Dave Kohne before, so there's a bunch of bullshit going
867 on. [Howard stops the tape to talk about Dave Kohne off the record – doesn't like
868 him, thinks he's greedy. Accused Birndorf of conflicts of interests because he was
869 sitting on the boards of other companies, etc., which is, says Birndorf, 'something
870 that happens all the time.']

871 **JONES:** At the time you were thinking about starting Gen-Probe, was this the first
872 instance in which something came along, and you thought well, we could start a
873 company with this?

874 **BIRNDORF:** Yes. I had never really considered it before that. And the main reason
875 was that Tom Adams, and I highly respected his technical judgment, really said that
876 he thought this was a good idea and that it would be the basis of a company, and I
877 must admit that I was much more swayed by his decision than the technology, and
878 everything else. Because, you see, from my point of view, I don't view myself as
879 necessarily a -- you know, I can understand technology, and I can assess technology,
880 and I have done a good job of assessing it in the future, since then -- but at that
881 point, I didn't know that much about the market for DNA probes, for example. I
882 learned a lot about it, but I wouldn't say -- what I considered my forte at that time
883 was getting things done, going in, getting the lab set up, getting the people hired,
884 getting deals with corporate partners, you know, that kind of stuff. Tom was the
885 thinking guy, and the technology guy, and I was the 'oomph.'

886 **JONES:** Was there talk about doing it inside Hybritech?

887 **BIRNDORF:** Yeah, we went to Hybritech and said, 'You guys should do this,' and
888 they said, 'No, it's defocusing.'

889 **JONES:** Who said no?

890 **BIRNDORF:** Well, at first I believe it was Ted Greene who said it. Tom took it to
891 Ted and Ted then went and talked to people, and said, 'I don't think we should do it.
892 It's too defocusing, because we're in antibodies, and that's probes. And we're trying
893 to therapeutics and diagnostics, and...,' and he was probably right. It would probably
894 have been too much for Hybritech to put under their belt at that time.

895 **JONES:** But he didn't want to lose you guys -- or maybe he was more concerned
896 about Tom Adams?

897 **BIRNDORF:** He didn't have any problem losing me, but he didn't want to lose Tom
898 Adams. But in fact, there was some stuff going on with Tom Adams at the time.
899 What happened was -- Tom is like a thinker, he's not a very -- what's the word I'm
900 looking for? He's not a very... [Howard turns off the tape again to tell me about Tom
901 Adams -- at the time of Gen- Probe, he was going through a messy divorce, had a

902 drinking problem; his ego gets in the way, he isn't satisfied to do what he does best -
903 - the technical stuff -- doesn't listen all the time, wants to be president, doesn't want
904 to hire the best people; Dennis Carlo didn't like reporting to him; look at what's
905 happened at Genta, etc., etc.]

906 **JONES:** Did you take other people with you from Hybritech to Gen-Probe? Bob
907 Wang?

908 **BIRNDORF:** Bob Wang didn't go right away. Yes, he came, but I don't remember
909 how long it was. I mean, we were under a specific covenant not to take people from
910 Hybritech, I mean, that wouldn't have been fair, unless we talked to them, and it
911 was, you know, sort of approved. Ultimately, there were some people that came over,
912 Larry Respess, Bob Wang, I don't remember who else. There were probably some
913 more, but not many.

914 **JONES:** Then IDEC starts in 1985...

915 **BIRNDORF:** Yeah, IDEC was another deal with Ivor. Ivor came to me with a guy
916 named Bob Sobol, and Ivor wanted to know if I would help Bob Sobol set up this
917 company. Because Ivor is the idea guy -- he doesn't really get involved in the details
918 like setting up head counts, setting up budgets, finding spaces, that sort of stuff. So, I
919 started helping them, and that was at the very, very beginning, so I was a founder.
920 So, it was me, Sobol, and Ivor, and we went to Brook and we tried to get Brook to
921 invest, and he finally did. Then, we merged it with this other company that was Ron
922 Levy and Rich Miller from Stanford. They had BT something or other. So, we had
923 two facilities. So there were like five founders.

924 **JONES:** Did you leave Gen-Probe to do that?

925 **BIRNDORF:** No, I went on the board. I never worked at IDEC as an employee.

926 **JONES:** After that, did you start to think, this is what I really like to do, start
927 companies?

928 **BIRNDORF:** No, actually, I saw the economic value of starting companies and
929 getting founder's stock. And doing it with the right group of people, and good ideas.
930 And how you could raise money, how you could put together a team -- you didn't
931 even necessarily have to be in the company, you could be on the board. I didn't
932 really make that much money from IDEC. I got four percent of the company

933 originally. I remember arguing with Brook about that. He didn't think I should get
934 that much. You know, there's only so much to go around. They're really tight, the
935 VCs, about that. But I ended up with it, and I went on the board. I was on the board
936 for five years, so I earned my keep, but they did reverse splits and everything, and I
937 ended up with about 50,000 shares of IDEC, which, you know, at one time, was
938 worth about one and a half million dollars or something like that. Today, it would be
939 worth just over a million dollars. So, you know, that was a nice gain, but it wasn't a
940 huge, gigantic, you know, I didn't make millions on IDEC.

941 **JONES:** And you were still at Gen-Probe at the time, which was not a happy place to
942 be?

943 **BIRNDORF:** No, it was happy then. Oh yeah, this was at the beginning, things were
944 really cooking, Gen-Probe was...the technology was moving, things were fine then.
945 In '84, '85, things were great. It really started, for me, to fall apart at the end of '86
946 and '87. We went public in October of '87. Meantime, in '86, I helped to start Gensia.
947 The two entrepreneurs came to me, Paul Laikind and Harry Gruber, and they
948 wanted to get my advice about this deal. I think I still have the original business plan
949 that they gave me. I saw it in here the other day... [looks through the drawer again]. I
950 saw this the other day, one of the original things -- here it is. This is April 2nd, 1986.
951 It says received by Tom Adams, but they sent it to me. I don't know why. Oh, I
952 know, we shared a secretary. So this is their CVs, and here's the executive summary
953 [laughs]. This is gene therapy. Yeah, see they were looking at something totally
954 different.

955 **JONES:** Than what they're doing now?

956 **BIRNDORF:** Yeah, they have Compound Q, which turned out...Well, now they're
957 doing something totally different. None of this stuff ever worked. I mean, it worked,
958 but they screwed up the clinicals so bad. Anyway, this was the first document. So,
959 they came to me, and I thought it was a good idea, especially the cardiovascular
960 stuff. I took it to Brook, and I remember, we had a dinner, me, Brook, and these two
961 guys at Mille Fleurs in Rancho Santa Fe, and Brook offered to do the entire deal.

962 **JONES:** That's unusual, right?

963 **BIRNDORF:** Right. To fund it for sixty percent of the company -- I don't remember
964 the exact total -- but he offered to do the deal and they turned him down.

965 **JONES:** Why?

966 **BIRNDORF:** I don't remember their reasoning. They were afraid, I think. They were
967 afraid. So, it ended up being...We had the first board meeting over my kitchen table.
968 There was a guy named Dick Schneider from 3i, at the time. Another guy that he and
969 I -- whew. This is a personality driven business, as you can imagine. Dick Schneider,
970 a guy named Jim Blair from Domain. Now Schneider works with Blair, he went over
971 to Domain subsequently, but at that point, he was at 3i. I was involved, and I
972 brought in KP. KP came in. I went on the board, I was a founding board member,
973 and they funded it as a syndicate as opposed to just KP. And I think those guys look
974 back and they probably regret that decision.

975 **JONES:** Well, they got out OK, didn't they?

976 **BIRNDORF:** Nah, Paul Laikind, I just saw him about two weeks ago at this Bill
977 Otterson thing, and he's still there. I just sold out my entire position of Gensia this
978 morning, the rest of it. I mean I've held it for eleven years, and I just figured, you
979 know, there's just no sense. Maybe Hale will pull it out, but I don't have time to wait
980 on him anymore. It's been at four bucks for years. It did a three for two split and
981 then went as high as fifty bucks, or something. So, it was a high flyer. It had a billion
982 and a half market cap. They have raised so much money over the years. David Hale
983 is a really good guy. He's a really nice person. He's a very hard worker. But he got
984 very much distracted. He was on too many boards, too many charities, too many
985 YPO, too many political things. He was just spread all over the map. I kept telling
986 him. I said several times at board meetings that I thought that was the case. But
987 nobody listened to me. They were all afraid that they would piss off Hale if they told
988 him. So finally, they asked me -- it was time to redo the board -- and they asked me
989 to go off the board, and I dodged a big lawsuit by doing that, it was great. Anyway, it
990 wouldn't have been personally to me, but.... So, yeah, they came to me, I turned
991 them on to Brook, I went and met with some of their scientists, and this and that,
992 and you know, I took them to Brook, and then he offered them the deal and it didn't
993 work. So we formed this syndicate with Domain and 3i and Brook, and I don't
994 remember who else was in it, and we started the company in '86, and I was still in
995 Gen- Probe, and I got some stock, and then I bought some, too, and what else? The
996 same deal, I went on the board, and I was on that board for five, six years, as well.

997 **JONES:** And shortly thereafter, Progenx, right?

998 **BIRNDORF:** Right. What happened with Progenx was Adams and I really started
999 not getting along in '87, and they brought in this guy, Bologna. He and I always got
1000 along. I didn't always agree with him, but then with Dave Kohne, and the board,
1001 and....So, my job was to do corporate deals. We hadn't done a really good corporate
1002 deal yet, at Gen-Probe. I went on this trip in mid-'87 to Japan, and saw about, I don't
1003 know, ten, fifteen companies, and one of them was particularly interested -- Chugai.
1004 So, I started negotiating with them. I went back in September and we started talking
1005 about a deal. Another factor in this whole thing was, in June of '86, I came down
1006 with chronic fatigue syndrome.

1007 **JONES:** Working too hard?

1008 **BIRNDORF:** Who knows? Who knows what causes that? It was really weird. It took
1009 me like months -- I have a whole file here from that, of me trying to figure out what
1010 the hell I had. It was really -- your memory is all fucked up, and you feel like your
1011 head's packed with cotton, and you feel like, removed from the world, and that was
1012 putting a big strain on me, and I took most of November of '86 off and went to this
1013 like, health resort, and just stayed there for a month, and that helped. I gradually
1014 started getting better. And then in '87, I was still affected, but not that bad. I still,
1015 even now, have an occasional day where I feel chronic fatigued. But for the most
1016 part, I don't feel it anymore. Anyway, I had that. That was really causing me some
1017 difficulties, but I stayed, and I worked. I was trying to take off as much time as I
1018 could, but I was still working. Anyway, I went to Japan, I did this thing, and then I
1019 started negotiating with Chugai, and I got into a very close personal relationship
1020 with the guy. I mean, we really had a very close personal relationship, the Japanese
1021 guy who was my counterpart.

1022 **JONES:** What's it like doing business with the Japanese?

1023 **BIRNDORF:** It's all based on that. So, because I had such a good relationship, in late
1024 '87, I don't remember if it was October, November, somewhere around there, we had
1025 an off-site, and we hired this guy Newt somebody or other, who was the dean of a
1026 business school at UC- Irvine or one of these UC campuses. And we had this off-site
1027 that was more like an encounter group with all of the management. It was up in
1028 Laguna Beach, and it was -- Adams and Kohne got on my case so bad that I finally
1029 said, 'Fuck you guys, I quit.'

1030 **JONES:** So, you didn't go back?

1031 **BIRNDORF:** Well, I went back. It was like November. My last day was...I quit as of
1032 the end of the year. We had this big thing with the board and everything. I stayed on
1033 the board, but I couldn't work with those guys anymore. I was sick of them. It was
1034 just so ridiculous there. But they needed me to do the Chugai thing, so they hired
1035 me as a consultant, and I stayed and I went to Japan and closed the deal in April of
1036 '88. So we closed this fifteen million dollar -- three million a year for five years -- deal
1037 with Chugai. Which was really a good deal for them, for Gen-Probe. Well, it was
1038 good for both. And that was what led into them buying the company. Obviously they
1039 had a relationship with us. And I took Bologna there and introduced him when we
1040 were trying to sell the company and got him set up, and then he did the sale. I won't
1041 take credit for that, but I think my relationship with them really did help. So, I was
1042 leaving at the end of the year, '87. December 31 was my last day, and of course, it was
1043 very melancholy. They gave me plaques, and all this bullshit, and Brook calls me up
1044 and he says, 'You know, I started this little company with some technology we
1045 licensed out of Scripps. This guy named Henry Niman, it's a diagnostic technology,
1046 it's looking for oncogene proteins in blood and urine,' and stuff like that. And it was
1047 with Drew Senyei, Dick Schneider, and Brook. And he called me up and he said,
1048 'Would you be interested in just being the start-up president for one year?' And I
1049 said, 'Yeah, why not?' It was the first time I'd been a president.

1050 **JONES:** And you were serving on boards, but....

1051 **BIRNDORF:** Right, I was on IDEC's board, I was on Gensia's board, I was on Gen-
1052 Probe's board, and I don't know what other boards I was on. I might have been on
1053 some other boards at the time, I don't remember. And so I said, 'Yeah, OK,' and you
1054 know, he said, 'You've got to take a low salary because it's a start-up.' So I agreed on,
1055 I don't know, a hundred grand salary. And at the same time, they were recruiting
1056 Tina from Hybritech to be director of research there. So, I remember my last day at
1057 Gen-Probe was December 31, and I went to Europe for a two week vacation with my
1058 then wife. We went skiing with some friends, and we came back, and I started the
1059 16th of January 1988 at this Progenx, is what they called it, and it was this guy Henry
1060 Niman, and he had taken this whole group out of Scripps, this whole group of about
1061 eight to ten people. They had rented space over at General Atomics, so we had some
1062 labs, and little offices and stuff.

1063 **JONES:** How did they get hooked up with the VCs?

1064 **BIRNDORF:** Brook was cultivating Richard Lerner. Richard Lerner is the head of
1065 Scripps Research. Richard apparently came to him and said, 'I've got this hot
1066 technology, it's ready to be commercialized.' The real deal was, they just wanted to
1067 get this guy Henry Niman out. This guy was just a flake -- it turns out. I didn't know
1068 that. So these guys negotiated this deal. They paid Scripps half a million dollars in
1069 cash with ongoing royalty obligations, and for that, they got these patent
1070 applications, Henry Niman, his group, and four hundred antibodies that had already
1071 been made came over to the company. So, Tina and I started at the same time, mid-
1072 January of '88, and we started, you know, hiring people, getting equipment, you
1073 know, there was some equipment there, and we were ordering equipment and hiring
1074 people and everything else, and we're going along and we're going along, and this
1075 guy, Henry Niman, he talked a language called Nimanese, we called it, because he
1076 talked and talked and talked, and you tried and thought you understood it, maybe,
1077 but then, when he was finished, you'd go back and say, 'What did he say?' We had to
1078 buy this big hundred thousand dollar camera, where, basically, he'd run these
1079 samples on gels, and he'd get a bunch of bands. And he thought you could get a
1080 pattern recognition of these bands and diagnose disease or, he even said he could
1081 tell the difference between male and female sex from pregnant women's' urine,
1082 things like that. But it became very obvious very quickly, like after three to five
1083 months, I knew that this shit didn't work. I mean, he used to argue and say, 'See that
1084 band there?' And we'd all go, 'Where? There is no band there.' And he'd say, 'Yeah it
1085 is.' I mean, it was crazy. I kept thinking what the fuck, you know. What are we doing
1086 here? And even if it did work, how are you going to make it into a product? Is
1087 everybody going to have to buy this hundred thousand dollar camera? We couldn't
1088 standardize it, one gel to another. We tried putting markers in -- Tina was doing a
1089 great job with this -- but both of us came to the conclusion that this wasn't going to
1090 work. And I was trying to figure out what the hell to do. So, in the meantime, I had
1091 met Ron Evans, socially. My neighbor invited us over for dinner and Ron Evans was
1092 his friend, and he and his wife were there. So, we met, and talked and this and that.
1093 So, I called him up, and I said, 'You know, can I come over to the Salk Institute, just
1094 to see what the hell you're doing over there?' So, when I got over there, he said, 'You
1095 know, I've got some stuff that's really good and it's ready to be commercialized.' So
1096 he and I talked and we ended up doing a deal with the Salk, and I licensed his
1097 technology exclusively from the Salk Institute, and I signed that deal in November of
1098 '88. By that time, I had hired Larry Respass, who was tired of Gen-Probe, too. He had
1099 come over. So, it was me and Tina and Larry. Larry had been with me at Hybritech,

1100 then came to Gen-Probe, then came now to Ligand, to Progenx. So we decided to
1101 change everything, change the name...I remember I had a meeting with the VCs, all
1102 the VC investors, there was some meeting downtown at what's now, you know, the
1103 curved towers, what is that downtown, the Marriot? Yes, the Marriot. I remember
1104 trying to convince them to do this deal because they couldn't how we were going to
1105 make this into a business. I said, 'What we're going to do is, we're going to take these
1106 receptors, we're going to put them into cells, we develop high through-put
1107 screening, and it's going to be a drug discovery company.' I said, 'These receptors are
1108 good for all kinds of things.' We've got the sex hormone receptors for women's
1109 disease and cancers, we've got the glucocorticoid, the mineralocorticoid receptors
1110 that are good for inflammation, we've got the retinoids, certainly they're using it for
1111 wrinkles and stuff like that, acne. And then we're using vitamin D receptor, who
1112 knows what that's good for, cancer, and the androgen receptor for prostate cancer.
1113 There were all kinds of things that this stuff was good for. There were cardiovascular
1114 applications, we had ApoE receptor, and things like that. Actually, I don't remember
1115 if ApoE was one, we had various cholesterol regulating receptors. So, I convinced
1116 them, and we were running out of money. I don't know how much the first round
1117 was, but we were gradually chipping away at it. I convinced them that we should do
1118 it; we signed the deal in November, and then we did, basically, a new round of
1119 financing at the same price, so it was a restart, but nobody would pay a premium for
1120 it. We brought in Tony Evnin at Venrock and he went on the board, and I don't
1121 remember who else came in on that round, but I think we raised four or five million
1122 dollars, and we basically started hiring new kinds of people. We told Henry Niman
1123 to go find a job. He got a job at the University of Pittsburgh. He's still there. He's still
1124 trying to do this stuff. That's when we started Ligand. We changed the name; we did
1125 a contest about names; we came up with Ligand, and used it. That was the start of
1126 Ligand. The start of '88, we started Ligand. We moved into the new building, where
1127 they're still at right now, in '89 or '90.

1128 **JONES:** Biotech start-ups are not like big pharmaceutical companies or academic
1129 labs, they're different. How do you make them work?

1130 **BIRNDORF:** Well, first, you've got to believe that the science works, because if you
1131 don't see what the science can do, and you don't firmly believe...I mean, some people
1132 have said, 'If you put together the right team, it doesn't matter what they're doing.
1133 They'll make it work, even if the original stuff doesn't, they'll find something that
1134 does.' And that's probably true. But from my point of view, I always start with the

1135 science, and if I believe in it, then I can raise the money because I can tell a good
1136 story to the investors, and I have a group of investors that have been with me, you
1137 know like Bob Curry has been in four companies, Drew's been in two, Brook's been
1138 in seven.

1139 **JONES:** All of them?

1140 **BIRNDORF:** Yeah.

1141 **JONES:** Over time, has the kind of due diligence that Brook does for your companies
1142 changed?

1143 **BIRNDORF:** No, for this company....He was very leery about Nanogen at first. They
1144 didn't understand it. We couldn't explain it to them well. It's difficult to explain,
1145 especially early on. So, he sent down this guy, a consultant of theirs to due diligence,
1146 and he highly recommended it, so they invested, but I took it to them first and they
1147 passed on it, and I took it to Drew, and Drew went in it with me, and then KP came
1148 in.

1149 **JONES:** And that made a big difference when Drew came in?

1150 **BIRNDORF:** No, not so much. I think that then we were better able to go back at
1151 them and show them better stuff and convince them to come in. But nonetheless,
1152 you know, it's really, I can't answer your question because I don't know how to put it
1153 in words. You know, there's no set formula, how you do it. You just do it.

1154 **JONES:** How about working with the scientists? Do you have problems?

1155 **BIRNDORF:** There's always problems with the scientists. Scientists are unrealistic
1156 when it comes to business. They don't understand it. They're not good at it
1157 necessarily. Some are, some aren't. It's like anything. It's difficult to explain to them
1158 sometimes the economics. A lot of them are greedy. They think their idea is worth
1159 the world. They want unreasonable...you know, it's better to have a small piece of a
1160 big pie than a big piece of a small pie is one of the clichés that's been used over the
1161 years, but it's true. Some scientists are in it just to get their ideas put into practice,
1162 you know. They don't really care about the money. They just don't really care about
1163 it. And others are some of the greediest sons of bitches you ever saw. Dave Kohne
1164 was one of the greediest. He came into my office and pounded his fist and said,
1165 'Don't ever think that I'm not interested in money.' Even though his whole facade

1166 was the old scientist driving the old VW bug, he was a greedy son of a bitch. And of
1167 course, he'll probably say the same thing about me. He thinks I tried to screw him
1168 out of fifty thousand dollars once, so he has this big thing about it, but...I can't
1169 answer your real question about 'how does it work?' It works, that's all I know.

1170 **JONES:** So you make it work, but you're always working with different people in
1171 different situations....

1172 **BIRNDORF:** Yeah, sometimes it's harder than others. You know, it depends on
1173 assembling a group of people that work well together. I'm not an easy person to
1174 work with.

1175 **JONES:** And why is that?

1176 **BIRNDORF:** I'm demanding, I don't suffer fools lightly, I'm abrupt, people say that I
1177 wear my heart on my sleeve in the sense that they always know where they stand,
1178 when I'm happy or not happy. I don't consider myself a great manager of people, in
1179 fact, those kinds of things, really, I hate having to deal with, somebody who's
1180 unhappy about something. What I really like is the action. You know, going places,
1181 doing things, getting things done. Accomplishing something.

1182 **JONES:** Over the years, how hard have you worked at this?

1183 **BIRNDORF:** Oh, the way I work, it goes like this. At different stages of a start-up,
1184 you work a lot harder. Right now, I'm working my ass off, the last year I've been
1185 working my ass off. The first couple of years at this start-up, I didn't have to work
1186 that hard, because there's a lag phase between when technology is being developed,
1187 there's a lag phase before you can actually get data to go out and do things with. So,
1188 at the beginning of a start-up, there's a flurry of activity, and then, for me, there's a
1189 big lull, like for a year, where I do stuff, but it's not, I mean, I don't have to work
1190 eight hours a day, seven days a week. Yet, this week, I've put in like sixty hours
1191 already. Not including today. I was in Chicago one day, I've been all over the place.
1192 So, at this point, right now, my girlfriend's ready to leave me because she says I have
1193 no time for her, business is everything. And right now, it is. I've got no choice. I've
1194 got sixty people here that depend on me doing it. I'm leaving Sunday morning to go
1195 to Baltimore. I'll be in Baltimore on Monday and Tuesday. I mean, I'm all over the
1196 place. I'm going to Europe next month, I'm going to Miami, I'm going here, I'm going
1197 there, so right now, I'm putting in sixty to eighty hour weeks, but a year ago, I wasn't

1198 working this hard. I probably put in some twenty hour weeks. It's raising money, it's
1199 doing corporate deals, it's looking at technology acquisitions, it's looking at potential
1200 mergers or acquisitions, it's all kinds of things.

1201 **JONES:** In small start-ups like this, do things get pretty tense when the money starts
1202 to run out?

1203 **BIRNDORF:** You know, since I've been through it, I always know that, in the worst
1204 case, as long as we have something good, in the worst case, my venture investors will
1205 never let it go under. They've got too much to lose. So, I may have to do a diluted
1206 round, or a down round, which is never fun, but in the worst case, you now that
1207 they're there, and they're deep pockets. That's one of the good things about working
1208 with someone like Kleiner- Perkins, is that they have never let any company run
1209 aground.

1210 **JONES:** Did you come close with Progenx when that wasn't working?

1211 **BIRNDORF:** Yeah, I suppose that came close, if I hadn't found the Evans
1212 technology. That probably would have gone -- well, we would have found something
1213 else, I mean, who knows? I went out, I purposely went out, on my own, to try to find
1214 something else. I wasn't necessarily looking for the Evans technology, but I found it,
1215 and it turns out, that's one of the best technologies I ever found. It's very broad, we
1216 have the world locked up in the patent position. Having Larry there was absolutely --
1217 Larry's a genius at that. And you know, these things aren't necessarily me. It's the
1218 people that I bring in. If I bring in the best people, I get the best results. So the key
1219 thing there is hiring people that are as good as or better than you are. A lot of people
1220 won't do that. I can name a couple of presidents... [phone rings]

1221 **END INTERVIEW**

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