



FINDLAY E. RUSSELL
(1919 -)

INTERVIEWED BY
SHIRLEY K. COHEN

January 18, 1994

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Subject area

Biology, biochemistry, toxicology

Abstract

An interview in one session in 1994 with Findlay E. Russell, MD, toxicologist, and former Caltech research fellow (1951-1953). He recalls applying for a research fellowship at Caltech under Professor Anthonie Van Harreveld in the biology division during his time as an intern at Los Angeles County General Hospital (now Los Angeles County and USC Medical Center). Comments on decision to undertake research in neurophysiology during clinical training; his early and continuing interest in venomous and poisonous animals and the effect of toxins on the nervous system. Recollects the Caltech Biology Division in the early 1950s; his colleagues Howard Teas and Richard Schweets; Max Delbrück's influence on the students. Efforts by Russell to improve student social life include teaching students ballroom dancing and holding dances with Pasadena City College. His own research on stingray venom eventually supported by Office of Naval Research. In 1953 he moves to the Huntington Institute of Medical Research at the Henry Huntington Hospital in Pasadena. Other reminiscences of life at Caltech and in Pasadena include: R. Feynman's defense of the local burlesque theater, the Burbank (1969); organizing a faculty volleyball team, which includes Nobelist William Shockley; memories of G. Beadle, A. Haagen-Smit, L. Pauling; treating Pauling's dog with vitamin C injections;

various pranks. His participation in and enthusiasm for Kent Clark's musical shows on Caltech life. He leaves Huntington for professorship at USC in 1955. Consulting work for United Nations and other governmental agencies takes him all over the world.

Administrative information

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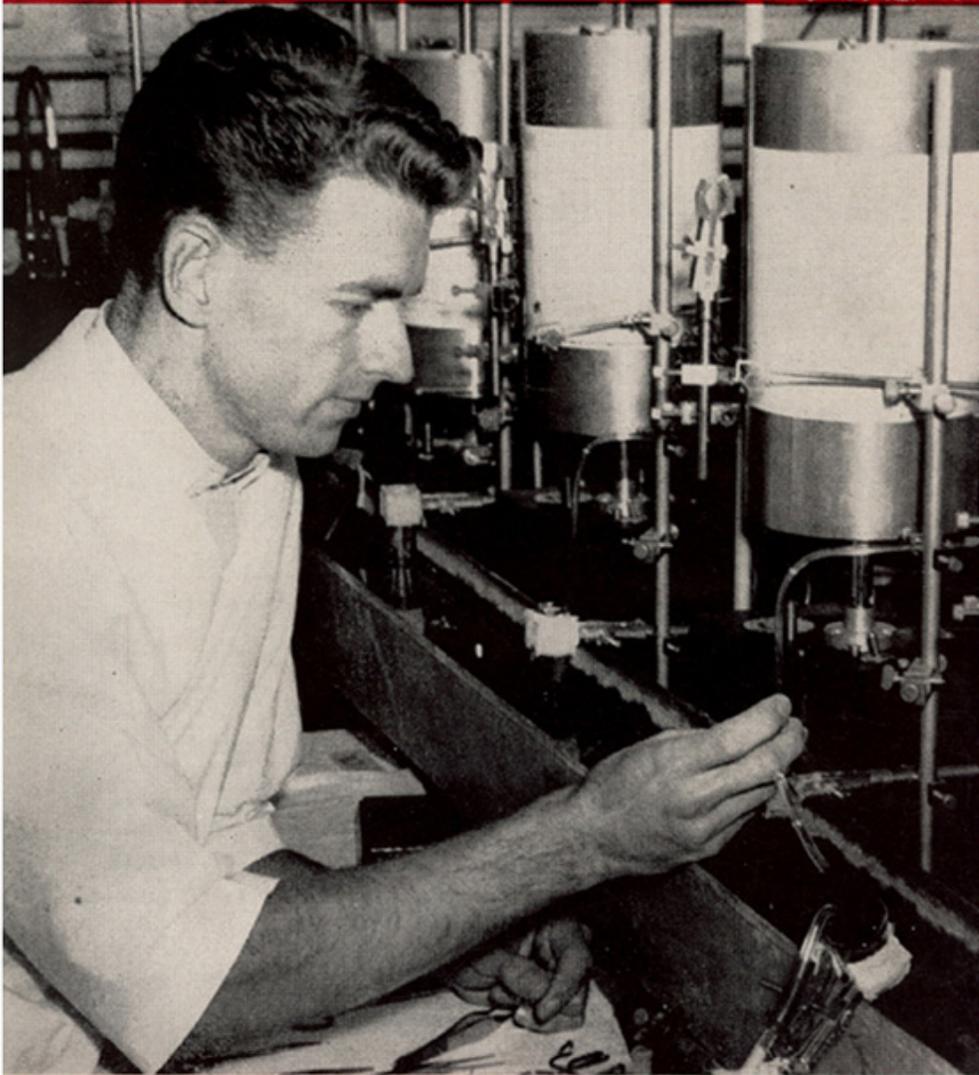
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Stingray Research . . . page 13

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In his lab at the Huntington Institute for Medical Research, Findlay Russell is adding stingray venom to a saline bath which contains a ring section of an artery. The artery is connected to a writing arm which traces the amount of constriction or dilation caused by the toxin on a Kymograph. The research is described in the accompanying article in *Engineering and Science*. Russell was appointed neurological physiologist at HIMR in 1953, following his postdoctoral work at Caltech. Courtesy of *Engineering and Science*. Used by permission.

CALIFORNIA INSTITUTE OF TECHNOLOGY

ORAL HISTORY PROJECT

INTERVIEW WITH FINDLAY E. RUSSELL

BY SHIRLEY K. COHEN

PASADENA, CALIFORNIA

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Interview with Findlay E. Russell
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January 18, 1994

Begin Tape 1, Side 1

COHEN: Would you like to say a little bit about your growing up and background?

RUSSELL: Sure. I grew up in Los Angeles. My father worked at the Biltmore Hotel. I went to primary school at Santa Barbara Avenue Grammar School, then Foshay Junior High and, of course, Manual Arts High School. That's where Jimmy Doolittle, Lawrence Tibbett, Governor Goodwin Knight and a lot of other people went who, like myself, didn't know what they wanted to be when they grew up. Manual was quite a well-known institution, academically, in those days. From Manual, my education drifted to several schools: the University of Southern California, where I had a part scholarship, and then I finished my BA at Walla Walla College in Walla Walla, Washington. From there, I went to work just before the Second World War as a chemical engineer in Ohio, and then into the Army. I was in combat, battle stars, a Purple Heart, that sort of thing. I came back in 1946 after an injury and went into medical school. I took the first part of my medical education at USC [University of Southern California] and then transferred to Loma Linda University because of the need for surgery on the injured hand. Loma Linda had a highly respected hand surgeon who was a good friend of my father's and of our family physician. He operated on my hand and I stayed and graduated with my MD from there.

COHEN: Had this always been a desire of yours—to become a doctor?

RUSSELL: Well, not always. This was something our family doctor had encouraged me into while I was at Manual Arts. But I also had an interest, even in high school, in venomous and poisonous animals. I actually wrote a paper there which took me to an "honors session" at

Caltech back in 1938. Caltech was just sort of out there, beyond my reach academically but that session was an enjoyable experience. Among other things I met some very gifted people—I remember [Robert A.] Millikan, [Linus] Pauling, and several others.

After completing medical school, I took my internship at the Los Angeles County General Hospital. About that time there was a scholarship called the Giannini-Bank of America Fellowship that was given to two graduating medical students in California each year and I was lucky enough to get one of them. During my internship I did some research with Dr. C. Courville in neurology at the County Hospital. He was a well-known neurologist, working mostly on traumatic injuries to the skull. I whetted my interest in research there with him. I thought that rather than take a straight residency in clinical medicine, I might try to take in a discipline that gave me some exposure to research, in case I really liked it and decided to go into medical research later on. So, with this in mind I approached the dean at Loma Linda, Walter E. Macpherson, and asked him where he thought I could get some good research experience in neurophysiology, which I had in the back of my mind, and still be able to divert a little time to my interest in venomous animals. He suggested Caltech and referred me to Dr. [Anthonie] Van Harreveld. I might say that I was probably the most naive, if not the most ill-prepared, postdoc to grace Caltech's halls to that time.

COHEN: Was that somewhat unusual, to take an MD rather than a PhD as a research fellow?

RUSSELL: Yes, actually, it was. I noticed—and I just looked through Caltech's 1952 *Biology*—that there were more than 40 PhDs and only one MD. That was me. So I came in very green to basic research, a kind of a laugh, I think. I took my PhD later, while I was teaching at USC.

COHEN: That was in the '70s?

RUSSELL: Yes, that's right. Actually, '73-'74. Getting back to my Caltech experience, I remember that while I was still an intern I thought I should drive over for an interview with Dr. Van Harreveld. I called him; I remember him as being very gracious and understanding of my lack of research experience. I thought, perhaps, he felt sorry for me. He too was an MD. [Laughter] I soon found out what a remarkable person was Dr. Van, as well as one of the best

teachers I ever had. I always regretted—years later, when he passed away—that I hadn't even known he had been ill. I was very upset with myself about this. So many times in life we meet someone who contributes so much to our lives but as time passes we procrastinate: "I'll call him later," or "I'm very busy now." It was six months after Dr. Van's passing that I learned of his death.

Anyway, Dr. Van Harreveld invited me over to Caltech and I accepted. I knew where Caltech *was* but I didn't know exactly where his office might be. The first building I wandered into was Sloan. I was a bit scared. Besides that, I didn't know exactly where I was on campus, so I checked the nearest bulletin board. There was a sign, one which I can hardly forget because it sort of lifted my spirits, made me feel a little more at home. The sign read, "EINSTEIN FLUNKED ALGEBRA, WHY CAN'T I?" and under it somebody had penciled, "Because you're not Einstein." [Laughter]

Through my college years I had written a good many of our school's farces, like Kent Clark did at Caltech—but not on that level, of course. In college I think I majored in extracurricular activities, even writing short stories, taking a hand at plays, playing in local jazz bands, dumping talcum powder in the organ's pipes, that sort of thing. When I saw this sign, I said to myself, "Hey, maybe this place isn't so bad after all. These eggheads have a sense of humor." Of course, I found out later with Ray Owen, among many others, that Caltech was steeped in talent and humor, and when I met J. Kent Clark with his catholic versatility, I was assured I had come to the right place.

Anyway, I finally found Van Harreveld's office and we had our interview. That must have been in early '51, while I was an intern at the Los Angeles County General Hospital. He arranged for me to come over following the summer vacation and begin work on my fellowship. We also discussed various projects I might pursue. I remember saying, "Well, you know, I've had no experience in these kinds of research problems. I'll have to start from scratch." And I remember him saying, "The first thing we will need to do is build an oscilloscope." I followed him down the hall to a small shop and he said, "This is where we will build our oscilloscope." [Laughter] You know, it's like saying, "This is where you will blast off to the moon tomorrow, pack your lunch." Sure, I'd built radios and was somewhat mechanically minded. But *build* an oscilloscope?

COHEN: Did you move to Pasadena?

RUSSELL: Yes. Actually, the family moved to 415 North Wilson. I became very well acquainted with the owner of the house, who later helped Dr. Robert Pudenz and me develop a hydrocephalic shunt at the Huntington Institute of Medical Research, a shunt to transport cerebrospinal fluid from the lateral ventricles into the heart in hydrocephalic children.

The first few days I was in biology I met a fellow by the name of Howard Teas. Howard was well-trained in research in his particular field. I think he was working with [Alfred H.] Sturtevant and [Albert] Tyler; maybe [Emory] Ellis. Anyway, Howard was just the opposite from what I was in practically everything, except maybe politics; we were both Democrats. Otherwise, we had major disagreements on religion, philosophy, education and even food, which made us great friends during those few years. We actually shared many experiences together, fishing, collecting trips for snakes and spiders, diving and generally arguing the whole time we were at it. A few days after meeting Howard, I met Dick Schweet, and the three of us shared many experiences those years that I was there. I remember saying to Howard during that first week, "I'm going to the seminar tomorrow. Are you going?" And Howard said, "Nobody goes to the seminars unless they check on Max Delbrück." I said, "What do you mean, check on Max Delbrück? I don't even know who he is!" Howard said, "Well, what we do—if the seminar is any good, Delbrück will go. If he doesn't go, don't bother with it. It's called the Delbrück rule." So I said, "Well, how do you find out?" and Howard said, "I'll find out from Max's office." And sure enough, Max was going. So I decided that since this was my first week I'd better follow the "rule" and fit in with the rest of the comedians. So we all went. It was a fantastic seminar. Max was there in his usual seat. But you know who it was? Linus Pauling. [Laughter] That's why it was so good.

Later on—on this same topic of Max Delbrück—we would call down to his office every week to see whether he was attending the seminar. If he wasn't going, we wouldn't go. One time he made a mistake, I think. He always sat in the fourth row, just about the first or second seat off the aisle. This time the speaker was a physician from the American Medical Association. He was a good speaker but his data, to me as a brother physician, were rather dated. About five or six minutes along, up gets Delbrück, stretches, and walks out. Then, during the second slide, the graduate students in the back two rows got up and quietly slouched out too.

[Laughter] We later accused Max of leading us astray on that one.

The first major extracurricular experience I had something to do with was concocted at a party at Dick Schweet's house. Dr. Albert Tyler was there. I think he was a good friend of the Schweets'. Anyway, Tyler and I got to talking about music. Dick had told him that I had played with Phil Harris—*one* night—and Stan Kenton—*two* nights—during my college days. I had also played with a small band, the Bill-Roy band. I was also band boy for Phil Harris at the Baltimore Bowl one winter. So we got to talking about these experiences and Tyler, who seemed to have had a good background in jazz, said, “You know, Caltech students, when they come here as freshmen, are socially naive. I doubt that one out of ten went to high school proms.” I said, “Yes, I'd have to agree.” He said, “Why don't we hold a dancing class?” I said, “Sounds like a good idea.” Tyler added, “Well, you were with a band, and you went to Manual Arts so you must know how to dance.” I could hear it coming. “What do you have in mind?” and Tyler said, “Well, supposing we hold a dance class on Saturday nights and ask the freshmen to come.” We did, and about twenty freshmen signed up, also a couple of sophomores. This was in the days before ballroom masturbation. In those days you danced *with* a woman. You *held* her. You couldn't just stand off and wiggle at yourself. I said, “Where do we get the women?” and Tyler says, “Well, how about Pasadena City College?” I said, “Great! I happen to know a gym teacher over there. I'll call her,” which I did. I remember her saying, “Well, Caltech students are kind of socially stunted, but okay. I'll ask the girls.” A funny thing about that, about a month or two after the first session I happened to walk into a little hamburger joint on California at Lake and there was one of our Caltech students with the girl he had danced with. I believe he married her three years later. [Laughter] Anyway, I went over and set up a couple of large speakers and a turntable. I kind of planned an evening of music and dancing.

COHEN: Where did you do this?

RUSSELL: This was at the hall in a building on the corner of Wilson and California—Culbertson Hall. I got Dick Schweet to help me, and his wife to prepare punch or some soft drink. We got it all arranged, ready to go. Somebody, whose name I better not mention, said that he would provide the music. He was a bit square, I'm afraid, but I figured maybe he knew a little about current dance music. I think he was a research fellow at the time. Anyway, he was going to

bring the records. Well, at five minutes of seven there were still no records. Seven o'clock came and things were supposed to start, still no music; he hadn't shown up. We called his house; there was nobody home. I just happened to have brought along one 78 record, "The Johnson Rag," which was recorded in the early forties, as I remember. We got the Caltech students lined up and partners were chosen. The girls then started to teach the boys steps to "The Johnson Rag." Everybody seemed to be having fun, so we played "The Johnson Rag" again, waiting arrival of the other records. We played it about five or six times. [Laughter] I don't believe anybody really noticed it, except one joker who said, "Oh, that again?" But everybody seemed to be enjoying the session. Albert Tyler said, "I think we should do this more often, dance classes, I mean." Oh, I forgot something important. I had brought "The Johnson Rag" along in order to check out the PA system. But there were some other records there that somebody else must have brought and we put those on too. The first one was "South Pacific." Now there's *no way* of dancing to "South Pacific." The second was "Some Enchanted Evening"—and how ever are you going to fox-trot to that? Finally, "The Student Prince." Thank goodness none of them got more than a minute's airing. I think the girls were about to head for the door. We must have played "The Johnson Rag" about ten times—between glasses of punch, of course.

COHEN: So you were really doing student activities?

RUSSELL: Yes, in a way. In fact, on the more scholastic side I often took students with me to collect the stingrays I was working on. I had friends in Balboa who had a couple of dinghies, and we used to go out at low tide and fish for the large bat stingrays. We joined the Shark and Stingray Club, a group that fished on weekend nights at low tide. Howard Teas and Dick Schweet usually went, plus a half dozen students. We always had an enjoyable time. I still hear from two of the students about those trips.

COHEN: Was this stingray business something you were doing before you came to Caltech?

RUSSELL: No. Dr. Van Harreveld informed me that they had no funds for this sort of investigation. He did have some support to study stretch receptors in the pectoral girdle of the goldfish, and that's what I was doing much of the time. Dr. Van asked me, "Well, would you

like to have your own project?” And I said, “I would like to work on the venom of the stingray.” He said, “Well, unfortunately, I’m afraid we don’t have any money for that kind of research.” I told him about an argument I had with someone at the California Fish and Game who said that the symptoms and signs of a stingray sting were just due to all-purpose gunk, not a toxin. They said the fish wasn’t venomous; it was just a non-specific reaction to the slime. But I had this interest in these animals and their toxins and didn’t believe this, so I asked Dr. Van, “Can we settle this dispute by doing some work on the tissues from the sting? Let’s catch the stingrays, grind up the sting’s encasing tissues, inject them into a rodent and see what happens.” Which we did.

First, we had to collect these animals, which wasn’t easy. A group of us, including students as I have noted before, would go down on weekend nights and stay till midnight or so, if there was a good low tide, catch the rays, cut off the stings, and place them in acetone and dry ice, then return the rays to the bay. The rest of that night we would separate the material, keep the tissue at minus 30° C and hold it there for our experiments.

COHEN: Were these undergraduates who just did it for sociability?

RUSSELL: Just for the fun of it, to fish, and a few bottles of beer. There may have been a slight threat, I don’t remember. [Laughter] I think everyone had a good time.

But since there wasn’t any money for the research, I had to do the experiments with what Dr. Van Harrevelde could muster. He was most generous, as usual, but it was thin pickings. Then he said, “Well, maybe we can get a grant for this.” I was getting what I thought was a tremendous salary through my fellowship—\$3,000 a year, something like that—and at the same time I was running a small emergency hospital at night in Alhambra for the Police Departments of Alhambra, San Marino, and North San Gabriel, just to pick up enough for feeding the wife, three kids and a big dog. I would go down to Alhambra at five or six in the evening and stay until eight the next morning, attending mostly traumatic stuff, drunks, and medical exams for the police departments. I practiced medicine the whole time I was at Caltech. But getting back to Dr. Van, he said, “Well, I guess the best thing to do is to apply for funds from some granting agency.” I said, “That’s fine with me.” Dr. Van suggested we write and find out who might be interested in the project. Even in those days there were the glamour diseases, cancer and heart

disease, no AIDS, of course. Ours was hardly in the glamour department.

All of those we contacted wrote back saying they didn't think there was anything they could support in this particular field. However, a friend of mine in Washington wrote, "Why don't you come back here and we'll talk about this project." So I got on the next Greyhound bus and four days later I was in Washington. I think it was \$75 round-trip, which was about all I had. Dr. Van, of course, was his usual generous self, so I didn't starve. I went to the National Institutes of Health and they said, "Oh, no, that would not have much of a priority here." Then I went to the National Science Foundation, and they said, "Well, we are not supporting anyone working on venoms or toxins." Subsequently, I might say, I was on committees for those organizations for almost thirty years and I made sure that toxicologists got a grant here and there in spite of cancer, heart disease and AIDS.

Anyway, I made the tour of Washington agencies, came back to the bus station and sat down. There was a big black policeman sitting next to me and he asked, "Where are you from?" I said, "I'm from Pasadena, from Caltech." "Oh," he says, "I read something about Caltech the other day"—probably another Caltech prank. We got to talking, and I told him about the research for which I was trying to raise monies. He said, "Listen, let me give you a name." I thought, well, my bus is leaving in a couple of hours but I'll take the chance. "I want you to see Dr. Sidney Galler at the Office of Naval Research on Constitution Avenue. For ten years, I parked his car every day. He's a great scientist, and you just tell him Mr. Jackson sent you." [Laughter] Well, you know, what I needed most was a policeman from Washington, D.C., initiating my scientific career or telling me where I could get money.

I called, and Galler's secretary said, "Well, can you come over?" I said, "Yes, I can come over and catch a later Greyhound." So I got a bus to Constitution Avenue and Dr. Galler came out of his office to greet me. He was a very pleasant, chubby little man. I believe later he was head of the Smithsonian Institution. I told him about our work, and he said, "That's just the kind of project we're looking for." I couldn't believe this! So we put in for a grant—I think it was for \$3,000—and we got it. That started our stingray project on a respectable basis. From there on, during the next thirty-five years, I had an ONR grant and have enjoyed a pleasant working association with that organization both in the US, Europe and the Middle East.

COHEN: So this was your career here for two years, and then you went on and continued this

research?

RUSSELL: Right, at the Huntington Institute of Medical Research, as it was known in 1953.

COHEN: Was there a very close relationship between the two institutes?

RUSSELL: Yes, very much so. During my second year at Caltech, Dr. Clinton Thienes came over from the Huntington, which had just started up, and talked with me about a position there. Dr. Thienes had been professor of pharmacology at USC and had now become the director of this new institute. So, he seduced me by offering a salary of \$5,000 a year and “you’ll be our chief physiologist.” I said, “Fine.” And that’s where I became acquainted with Doctors Robert Pudenz and Hunter Sheldon, about whom I’ll say something more in a few minutes.

I met [Richard] Feynman early on. We sometimes had lunch together and some pretty interesting discussions. But again, our fields were so different—mine was the clinical sort of thing and his was strictly theoretical, so we generally talked about music, painting and women. Actually, we got along just fine. But I mention this because years later, 1969 I think it was, he testified on behalf of the Burbank, Pasadena’s famous burlesque theater. Feynman was going down to testify that it was not only an acceptable form of art but a national treasure. We had a great time. He asked me to sit next to him. By that time I was quite well-known in both the community and medical profession, and I think he wanted to show that the Burbank appealed to all forms of our culture. I almost split my sides at his high jinks but he was completely serious. I think he did the whole thing with tongue in cheek.

To go back to my first or second week at Caltech—one day a little old man came walking in and asked me about my work. I figured he was a member of the Board of Trustees, although his questions were extremely intelligent—no reflection on the Board of Trustees. I was very pleasant to him, and he was very pleasant to me. He walked out and Van Harrevelde came in and said, “What was Dr. Millikan in here about?” I said, “*That’s* Dr. Millikan? Oh no!” When I saw Dr. M. on campus later, I nodded and smiled and he nodded to me. It made my day.

Dr. Van told me a story that was common at the time. I’ve heard it from other sources since then, so I imagine it’s true. It appears that Dr. Millikan had a maid, and I gather she must have been black from the way the story is told. One night, somebody called and said, “I need a

doctor right away. Can Dr. Millikan come?" And the maid was reported to have said, "I'm sorry, sir, Dr. Millikan isn't the kind of doctor that can do anybody any good."

One of the pranks that I'm not terribly proud of—and I'm not sure whether it was done before I came to Caltech, but the three of us—Schweet, Teas and I—got involved with Jurgensen's Market. In those days, Jurgensen's shunned Caltech students. You'd go in to get a bone for your dog, or some hamburger, and after they'd finished with *all* the little old ladies on the block they would wait on you. Dick Schweet got very upset about this one afternoon and said, "We ought to do something about this." I said, "I've got an idea." We operated on cats given to us by the Pound every couple of days. Sometimes we operated on several of these animals a day. They were the ideal mammals to study human central-nervous-system problems, and they are still for this purpose. The brain was Van Harreveld's principal interest. Someone said, "Why don't we take these animals and skin them, just leaving the tail on. We'll put on our white coats and go down to Jurgensen's; and while all these little old ladies are along the counter in the afternoon, we'll take the wrapped up animals and throw them up on the counter, unwrap them and yell, 'Joe, here are the rabbits you ordered,' and then we'll freak out, but fast." According to our third person in the store, the women gasped in horror and the poor butchers didn't know exactly how to react to our diligence. [Laughter]

Then there was the incident of the fishes involving [Arie Jan] Haagen-Smit in the biology library. [George] Beadle didn't want them in there so there was some friction between Beadle and Haagen-Smit over their being in the aquaria along the walls. Since I was involved with fishes, it fell on me to feed them, which didn't exactly put me in Beadle's good graces. There were several other incidents involving my poor showing with Beadle that were called to my attention by Ray Owen years later.

COHEN: With feeding the fish?

RUSSELL: Well, no, that I was guilty of. I believe Beadle had entertained the idea of selling the marine laboratory at Corona del Mar, but most of the faculty in biology were opposed to the idea. I was asked to go down there—I had a friend who was a construction engineer, and I had a contractor's license—and find out how the laboratory could be improved to be more useful to Caltech, whether another level could be added to the existing structure. I was doing the

measurements there when Beadle walked up. I was with George McGinitie. Beadle didn't ask me what I was doing, but it was obvious that I was taking measurements. So I got in trouble with him over that, although I didn't learn of this until later. I really wanted to apologize to him but since there were two of his professors involved in the request to do this, and who were opposed to parting with the laboratory, I never begged the point.

COHEN: I'm a little confused. You led me from fish in the library to Corona del Mar.

RUSSELL: Okay. Sorry. The fish-in-the-library thing was something Haagen-Smit asked me to do—that is, feed the fish and clean the tanks. I enjoyed doing this for Haggy. I was feeding them one day when Beadle came in. He said, “What do you think we ought to do about these fish?” Of course, I didn't know what he was talking about. I didn't realize that there had already been friction over the problem. It was only later that Haagen-Smit told me that Beadle had wanted to move the fish out, and Haggy said to me, “Why don't you tell Beadle, next time, that he should move the books out.” [Laughter] But that was like Haagen-Smit.

COHEN: So then the Corona del Mar incident became...

RUSSELL: Well, there were a lot of people involved in that one. At least, Ray Owen knows about that episode, so does Kent Clark. The others, I'm afraid, I'll pass on.

One of the things that certainly should be noted was our famous faculty volleyball team. I think I organized it. Kent Clark was on it, and we had Paul Saltman and Hershel Davidson, plus four or five others. I think we were quite good. We used to play the faculties at Occidental, La Verne, Pomona, Scripps, and some of the local colleges. We would drive down to these institutions, and after the game the two teams would get together at the home of one of the upper-echelon administrators. Once, we were at the University in La Verne; we had played them that evening, and we had Bill Shockley on our team.

COHEN: Was he a research fellow at the time?

RUSSELL: I don't think so. This was after he received the Nobel Prize, so he wouldn't have been

a research fellow, I don't think. I believe he was a visiting scientist, something like that, and a very good volleyball player. A very nice guy. I had trouble with all the things that have been said about him—because I never considered him in the cultural stance in which he was later cast. Anyway, after the game we went to the house of the vice-president of the university for dinner. One of the people—and I don't know who it was, I think it was Paul Saltman—wanted to make a phone call. The vice-president's wife said the phone wasn't working. Shockley overheard this and said, "Oh, can I have a look at it? I might be able to fix it." When he went to have a "look" at the telephone the woman said to me, "Does he know anything about telephones? Is he from the Telephone Company?" [Laughter] And I said, "No, he's won the Nobel Prize for his work on transistors." I don't think she knew what transistors were. He fixed the telephone. I don't believe she ever figured it out.

We had a none-too-popular postdoc fellow who used to play up to Linda Pauling. Unfortunately, he would show up, sometimes uninvited, at various parties, including one at the Paulings' place.

Begin Tape 1, Side 2

Anyway, this fellow had this little car. I think it was an American Bantam, a very small auto indeed, and between Kerckhoff and Church there was this bicycle rack in the parking area and he would park right in front of it, so you had trouble getting your bicycle in. And when we mentioned this to him, he'd pay no attention, so the problem got worse and worse. Anyway, he had a big tree—I think it was a big oak tree—in his backyard up in Altadena. So when he was gone one weekend, some of us went to see Ken Sorensen, who had this automotive shop nearby, and we obtained the plans for the American Bantam car. We studied them carefully, because we were going to go up that tree, push his car under it, disassemble it, and with pulleys pull it up to the top of the tree, then reassemble it. We couldn't get the motor up, it was too heavy, so we left that on the ground, but we did reassemble the car in the top branches. When we were done, we stayed around that Sunday night to see what would happen when he came home. But he didn't come home Sunday night. So early Monday morning we dragged off and went home. He didn't come home until Monday night, so we didn't really witness his reaction. But he came around several times that next week and asked each of us, point-blank, who did this to his car. I think he

eventually hired a palm tree pruner to put ladders up and disassemble the whole auto. There was no other way of getting it down intact. [Laughter]

I was speaking about the parking between Kerckhoff and Church. One evening, Pauling came in while we were working in the laboratory and said, "Somebody's parked in my parking place and I would appreciate it if they would move their car." Somebody did. The next day Pauling comes into class and says, "Last night, I asked someone to move his car from my parking place. I learned this morning that I only have rights to that parking place till five o'clock, and I want to apologize to whoever it was that parked there." It was very gracious, a typical Pauling.

On that Pauling thing, Kent [Clark] probably told you about our RNA model, the one we built on the stage of Pasadena City College in 1955, the year after Pauling won his first Nobel Prize. Caltech was hosting the AAAS [American Association for the Advancement of Science], and PCC lent Caltech its large auditorium for a Kent Clark-Elliott Davis show. I was at the Huntington by then but I was still coming over to Caltech when I could. We were going to assemble this RNA in three-dimensional blocks, like a tinker-toy set, only a big one that would go up to almost the ceiling on the stage during Kent's "This is Science?" I said to Kent, "Why don't we do this...?" and Kent said, "How long will it take?" I think I said, "Well, why don't we do it to the 'Entrance of the Gladiators.' That's three minutes. I've got a good record of it by Red Nichols. We'll start the record off with a big bang, then we'll rush out in our white coats and start putting this model together, finishing three minutes later." And we did. We got the whole thing put together with the aid of a ladder. Ed Furshpan got up on top and put the last piece in place. We did it all in the three minutes after one or two practices the day before. Pauling and DuBridge were there, of course, and they bellowed with laughter. I have a photo of them somewhere in my file.

But the funniest thing was that this "thing" had been tottering just a bit, and as we stepped back at the end of the assembly and took our bow, it collapsed. Everybody roared. We were, of course, very surprised but then we thought, "Hey, we better go with this." Later Pauling asked me, "How did you design that to fall right at that moment?" We hadn't. [Laughter] Kent wrote that wonderful ditty, "That's Not Gneiss," among others, for that program.

Oh yes, Pauling and the dog. Pauling had a small dog which was very old, and it had the usual hip dysplasia for this particular canine species. Pauling called Beadle about it, and Beadle

asked Van Harreveld whether I could do anything for it. They knew that I had some training in neurology. Pauling thought the trouble was neurological, so maybe I could help. I said I'd be happy to look at the dog. I went up to the Paulings, had dinner with them and examined the animal. The problem was obvious. The dog was dragging its back legs, it had the typical hip dysplasia. But anyway, I took the dog down to my emergency room in Alhambra and X-rayed it. The X-ray confirmed the diagnosis. At that time, we had an intravenous injection called the "Businessman's Cocktail." Businessmen would come in to the office on a Monday morning, after a hard weekend of drinking, for this "Cocktail," which consisted of 10 cc of fifty-percent glucose and vitamins B and C.

So I gave a modified cocktail to Pauling's dog. I put in a little extra Vitamin C. Why I ever did this, I'll never know. The dog got up and started running around the office. It hadn't used its leg muscles for months. I can't go into the physiopharmacology, but there was no doubt that the dog had much increased activity in his hind legs. So I rushed him back to Pauling before it wore off, as I knew it would. I told Pauling, "This probably won't last very long, but it may do some good if we try it every week or so." He asked, "What did you give the dog?" I didn't want to tell him about the glucose, which probably did most of the trick, so I just said, "I gave him Vitamin C and a few other things." Years later, I was accused by Dr. Joe Bogan, who was a very well-known neurosurgeon and friend of Pauling's, of having started the Vitamin C craze.

Well, the dog did get along fine for a while but then it went down hill again. I gave him the injections two or three more times, and then finally, when it was obvious that it didn't do much good, we stopped. I tried the same thing on our own dog one time when he had terminal cancer and it certainly seemed to increase his activity and his appetite.

There was a postdoc from England who wanted to go to a football game. Well, you know, I don't think Caltech had won a game in many years—or since the V-12 program. I said, "I'm afraid Caltech will lose but I'll take you." Anyway, we go to this football game toting his 8mm camera. I saw the film in England years later and everybody roared. There would be this Caltech quarterback passing and then the ball comes down and you see a Caltech end catching it. The next thing you see is the receiver being carried off the field on a stretcher. This was repeated three times. I think there were several other Caltech students hurt in that game. In fact, as I remember, we started with eleven players and ended with nine. They also had to finish with nine players. I heard that the first game Burt LaBrucherie won, he broke down and said, "This is

the happiest moment of my life.” I don’t know whether that’s true or not, but it was kind of a common story around campus.

We used to go—Dr. Anderson, Howard Teas, Dick Schweet, Sherman Ripley and myself—down to Baja California to collect the big stingrays. We’d drive down to the Gulf of California—before Steinbeck’s name became popular. Well, Sherman Ripley was from South Africa, and he didn’t have American citizenship or a Mexican visa. Coming back across the border was going to present a problem, so while he was in the car we taught him to say, “I’m from Alabama,” in a Southern accent. Then the inevitable happened. When we got to the border he was sound asleep and they didn’t wake him up. We were well into California when he woke up and said, “I’m from Alabama.”

Well, another story deals with the Huntington and Caltech and Robert Pudenz, who still lives here in Pasadena, a great guy; and with Dr. Hunter Sheldon. Sheldon had this idea how to put out forest fires, which involved a large plastic balloon and plastic pipes, or lightweight pipes, leading from the balloon to the fire, filling the bag with gas and taking it out near the fire, filling it with water from a ground source, then floating the balloon up over the fire. A variation was having a helicopter holding the pipes over the fire and spraying the water from there. Well, Dr. Sheldon asked me to figure out how much helium it would take to fill this balloon, and how much water it could transport from the water source. The owner of the house we rented, 415 North Wilson, was an engineer, and he helped me put this thing together on paper. The balloon and pipes were built but when we were ready to go, we didn’t have a room large enough to inflate this balloon with helium. We decided to use the surgery at the Huntington. It seemed large enough, and we inflated the balloon in it.

Now Hunter Sheldon was out in the hall directing the gas input. I was inside the room making sure that the bag filled and fitted into the room as it was inflated. Unfortunately, when it was completely inflated it filled the room, pushing me against a window. The Teflon valve got stuck and I was wedged between the balloon and the window. To make a long story short, we finally had to get the Fire Department to come around with a ladder and get me out.

COHEN: Now, this had nothing to do with Caltech?

RUSSELL: No, not directly. But I got some of the engineering people at Caltech to help me on

the design.

COHEN: Okay, so you finished up your stay there. And you then really left the area, is that correct?

RUSSELL: Well, I then went down to the Los Angeles County General Hospital in 1955. Dr. Phil Vogel asked me if I would like to develop a laboratory of neurological research there. I was first attached to Loma Linda University at the County Hospital and I stayed with them until they left the County Hospital in 1966. USC wanted me to continue the lab and training program, as we were well supported, and they absorbed me in '66. I remained with SC at the County until I retired, for the first time.

COHEN: Now, during this whole period of your life, you remained friends with Kent Clark. But did you have any other doings with Caltech?

RUSSELL: Not particularly. I was over there for various seminars, programs that Kent put on, and a few lunches and dinners with faculty members. I did have several students from Caltech at the County Hospital who later went into medicine and who at one time worked in my laboratory or did part of their residency or internship in the Hospital. I remember Truman Long, especially. I also came back to Caltech when Itzchak Parnas was there from Israel and George Hughes from England. I believe Parnas and I published together. But by that time, I think, I was a full professor at USC and was pretty busy. I had little time to continue my association with Dr. Van and Caltech.

COHEN: I looked up your vitae, and I noticed that you've traveled all over the place. What is your connection? Are you with the World Bank?

RUSSELL: I wish I was. I'm actually a consultant with several departments or agencies within our government. I have been on loan to the UN for medical work in the former Yugoslavia. Actually, I started at this consulting work when Lee DuBridge was President Nixon's scientific advisor. I did some things for DuBridge, wrote him reports on some of my experiences in

communist countries. That got me started, then someone asked me if I would help with the evaluation of certain scientific projects, mostly in Eastern Europe with the State. I recall talking to Lee DuBridge about a project in Yugoslavia to improve sanitary conditions on their side of the Adriatic. I went over there with my wife and we visited all the marine stations and subsequently prepared the reports that were needed. We sent in an estimate of the needs and later I learned that almost the exact amount was approved.

COHEN: So you're a consultant to the State Department. And you still remain so?

RUSSELL: Yes, to some extent, and to some other agencies, NIH [National Institutes of Health], the Office of Naval Research, US Armed Forces, National Science Foundation, Fulbright, etc.

COHEN: How would you sum up your experience at Caltech?

RUSSELL: I think it was one of the finest experiences of my life. I learned more, academically, during that short period of time than at any other period in my life. I met some of the finest people I have ever known, and I must say that I enjoyed myself thoroughly. I still relish my friendships with the few still there, and with Kent Clark. Memories of the days still come back to me. I miss Caltech.