

Floyd Dunn

Transcription of an Interview
taken on a Tape Recorder

By Carr Everbach

on

August 13, 2009
At Swarthmore College
in Everbach's Office

American Institute of Physics
Center for History of Physics
One Physics Ellipse
College Park, MD 20740

PREFACE

This manuscript is based on a tape-recorded interview conducted for the Center for History of Physics of the American Institute of Physics. The reader is asked to bear in mind that this is a transcript of the spoken word rather than a literary product.

This manuscript may be read and the tape heard by scholars approved by the Institute. The scholar must not quote from, cite or reproduce by any means this material except with the written permission of the Institute.

American Institute of Physics
Center for History of Physics

Interviewee: Floyd Dunn
At: Everbach's Office at Swarthmore College

Interviewer: Carr Everbach
Date: August 13, 2009

EVERBACH: My name is Carr Everbach, today's date is 13 August 2009, and I am in my office at Swarthmore College about to call Floyd Dunn at his home in Arizona. The time is 4:18^{PM} and I'm about to interview Floyd Dunn for the Acoustical Society of America, Technical Committee on Biomedical Ultrasound/ Bioresponse to Vibration.

DUNN: Hello?

EVERBACH: Hello, is this Floyd Dunn?

DUNN: Right.

EVERBACH: This is Carr Everbach.

DUNN: How are you?

EVERBACH: Sorry that I didn't call you exactly at 1:00. I hope that didn't inconvenience you.

DUNN: No, no, no.

EVERBACH: I had a little bit of trouble finding your phone number. I had misplaced it. But luckily, I found it.

DUNN: Good, good.

EVERBACH: Now I have some questions from a script that I was given by the Archive Committee, and I'd like to ask you these questions and have you just tell me whatever comes to your mind.

DUNN: OK.

EVERBACH: OK. We'll start off with "present status of interviewee." That's you. So, what is your present address?

DUNN: Present address?

EVERBACH: Yes.

DUNN: Well, it's, you know, it's in the handbook.

EVERBACH: OK, I'll tell you what, I'll skip the questions "what is your present address," "what is your telephone number," "who is your present employer," "what is their present business," "what is your present job title," "how long have you been with them," and "what do you do there." That's all the stuff that...

DUNN: I'll go through that, I don't care. The present address is my home address, and it's 13... are you taking this down or what?

EVERBACH: I'm recording it actually by audio tape.

DUNN: OK. 13500 North Rancho Vistoso Boulevard, Apartment 143, Tucson, Arizona 85755.

EVERBACH: OK, that's great. Present telephone number?

DUNN: Well, it's my home number.

EVERBACH: Right, it's the number I just called: 520-615-0003.

DUNN: Right.

EVERBACH: Present employer: retired?

DUNN: Well I'm fully retired from the University of Illinois. I do have a, whatever they call it, an appointment that lets me use the library and stuff like that.

EVERBACH: Right, emeritus status, or something.

DUNN: I'm emeritus there. But I also have an appointment at the University of Arizona, in the Department of Radiation Oncology, Radiology, I guess now it is.

EVERBACH: OK

DUNN: And I'm a kind of research professor, I get no salary, I have no responsibilities, as far as I can tell.

EVERBACH: OK

DUNN: And about all I do is talk to some people in the department, helping them get ~~some~~ grant funds, things of that sort.

EVERBACH: How long have you had that status?

DUNN: I don't know, about a year.

EVERBACH: OK

DUNN: I was in another department for 10 years, and they fired me, because I didn't do anything for them.

EVERBACH: Hah.

DUNN: But I had the same status. So I'm a research professor without any responsibilities or anything.

EVERBACH: OK, Floyd, thanks a lot. Let's move on to Acoustical Society related questions. What year did you join the ASA? What was your age and profession at the time, and what area of acoustics were you interested in then?

DUNN: Well I was a graduate student at the University of Illinois, and gosh I don't know, it must have been around 1950 but surely the Society has a better record than I have.

EVERBACH: Yeah, well, these are interview questions that are generic. I can dig up some of this data.

DUNN: Put a question mark after 1950, and I was just getting into I guess what you call biomedical acoustics and I was interested in it. And I was just about to drop out of the IEEE because I wasn't getting anything out of them, except a great big journal every month that I couldn't find a place to put. My department head encouraged me to become a member of IEEE; he encouraged everybody to do that. I didn't care for it at all. I couldn't understand what they were talking about ^{at meetings.} I knew about Maxwell's Equations, but I'd go to meetings and hear people approximate away the whole equation and come up with nothing and I didn't know what the heck they were doing and nobody wanted to talk to me. My advisor, Bill Fry, suggested that I look into the Acoustical Society. He thought it was a different kind of organization, and I did, and he was exactly right. Everybody was very helpful to me, and I looked forward to going to every meeting because I learned more there than I did out of textbooks and stuff like that.

EVERBACH: Now in those days, the Acoustical Society probably didn't have a technical committee that exactly matched your interests, so what ASA committees were you a member of then, or how did you...

DUNN: Physical Acoustics. That seemed to match my interests more than anything else, and that's what I sort of stuck with all these years.

EVERBACH: There was, later on in your career, we broke Physical Acoustics up, broke a piece off and called it Biomedical Ultrasound/Bioresponse to Vibration. I gather there is a proposal to change that yet again, and drop the Bioresponse to Vibration part.

DUNN: That initial idea was entirely Henning ^o Von Gierke ^{'s}. He was the only one who really wanted it, and talked everybody into it, and sort of forced everybody into it. The reason he did that is because the other group, whatever they call them, the people that ^{dealt with} ~~had~~ the effects of vibrating arms and legs and things like that, didn't have any place to go to. The other biological groups didn't want them, and so they were just sort of floundering. Henning thought it would be a good idea to have them involved with our group, and he forced it. It sort of stuck, but it didn't stick. ^{They} These guys didn't really find a home with our group, and only one or two of them ever came to our meetings, stuff like that.

EVERBACH: Now...

DUNN: Go ahead.

EVERBACH: Well I was going to ask about you personally, and the positions that you held. So you started off as a graduate student in Physical Acoustics, and as you say you found a lot of people whom you could talk to. Could you describe the positions you held or the path you took up through the ranks of ASA.

DUNN: The positions that I held?

EVERBACH: Positions. I knew you were president, for instance, later.

DUNN: Well I was vice president, and president, that may have been about it.

EVERBACH: OK

DUNN: I'm not really sure.

EVERBACH: OK, were there any particular ASA meetings that stand out in your memory as being something special, something different, or something humorous.

DUNN: No, I don't think so. I looked forward to the ASA meetings, all of them. I found all of them very worthwhile, from my point of view, ^F from the time I was a student

to the time I, uh, say, retired. No, I found ASA meetings very very special, let me put it that way.

EVERBACH: Were there any particular ASA members over the years who stood out as having particular influence upon you and your work?

DUNN: People like Ted ^{Litovitz} ~~Ludivitz~~. I'm trying to remember some of the other names, but I'm not coming up with them. But he was particularly useful for me. Oh heck.

EVERBACH: That's OK.

DUNN: I need to get a directory.

EVERBACH: That's OK. As we talk, things may jog loose. Is there anything you'd care to say about the ASA that you haven't already said, either back in the past when you were just starting, or now, or the future. Any comments about the ASA you'd like to make

DUNN: Well I would say the ASA was very important to me and to my career. I got a good deal of education through the ASA, particularly at meetings and at other times when I just corresponded with members. It was everything; I think I told you that my advisor, Bill Fry, suggested that I drop out of IEEE and try this, and he was absolutely right. It was so much different, I can't even describe the difference. But he knew about the ASA and he knew about the IEEE. Of course, I didn't know about anything at that time.

EVERBACH: Besides those two, what other professional organizations do you belong to?

DUNN: Well, I'm a member of the AIUM.

EVERBACH: OK

DUNN: What else am I member of? There are several of these other organizations that popped up the last 10 years dealing with bioengineering, and I'm a member of those.

the AIUM, the IOA, the

can't even remember the names of them. I became members of those mostly because other people urged me to when the organizations were just getting started.

EVERBACH: So you would say the ASA was your primary professional organization, where you had your intellectual home?

DUNN: Yes, absolutely.

EVERBACH: Now have you provided an oral history for any other organization? Did they ask you at the University of Illinois to do this? Or any other place?

DUNN: Well the IEEE did, but they never followed through. I was supposed to meet with somebody and it never happened.

EVERBACH: OK.

DUNN: I never did.

EVERBACH: I'd like to move on to the next set of questions, which is your past history. And I'll begin with "When and where were you born?"

DUNN: Kansas City, Missouri, April 14, 1924.

EVERBACH: OK. Before entering college, where were some of the places you lived?

DUNN: I lived all my life at that time in Kansas City, Missouri, and I went to a ~~Junior~~ College, Kansas City Junior College, after graduating from high school and during my second year I was drafted into the military.

EVERBACH: Hm, and so when you returned from the military, you then picked up at the University of Illinois?

DUNN: Yes, that's right. I had a teacher at ~~this~~ Kansas City Junior College that really talked up electrical engineering at the University of Illinois. I think he may have gotten a

Master's degree by attending summer schools there, I'm not sure, and he talked about it as the greatest, the best electrical engineering department in the country. So when I got out of the service, I applied and they accepted me.

EVERBACH: Well, let's go back before then, I want to ask what your parents did, your parents' occupations, anything about your parents you'd care to put on the record.

DUNN: My father was a watchmaker, and my mother didn't have a profession.

EVERBACH: OK. I was going to ask how you would describe yourself during those early years, before you went off to college.

DUNN: Oh, my, I don't know. I was probably more interested in sports than anything else, like a lot of kids. I liked baseball a lot, and I played. My neighborhood actually had a team, ⁱⁿ and a league. I don't know if we won any games, but we played a few.

EVERBACH: What did you want to be when you grew up?

DUNN: I think I wanted to be an engineer, but I'm not sure that I knew what an engineer was.

EVERBACH: But you didn't have any heroes who were engineers; they were probably mostly baseball players.

DUNN: That's right. That's exactly right. I didn't know any engineers, no one in the family, no neighbors or anything like that. But somehow, what I knew about engineering interested me. I really can't explain why at this time.

EVERBACH: OK. Were there any people in your life who influenced you in those early years—(that made you that you credit with helping your intellectual development?)

DUNN: Well I don't think anybody helped my intellectual development. The only figure I can remember is Lou Gehrig.

EVERBACH: Yeah, OK, let's talk about college now. You've already mentioned a few things. But you said, Where did you first go to college and what was your major? You've already mentioned going to this junior college

DUNN: Kansas City Junior College was the actual name.

EVERBACH: And what was your major when you were there?

DUNN: They had an engineering curriculum and I was in that.

EVERBACH: Why did you choose that college and that major?

DUNN: Choosing the college was simple, it had to do with money.

EVERBACH: Yeah.

DUNN: E Um, There was no money in our family for me to go to a state university or anything like that. ^{JUNIOR College} This was in town. I could ride the street car to get to it. Actually ^{during my} in the first year I worked during the day and went ^{to Junior College} there at night. I had made enough money ^{during that year} so that in the second year I could go during the day. But then I got drafted out of it, so it didn't make a whole lot of difference in the long run.

EVERBACH: Can you tell me anything about; ^{of my military career} you were drafted, and what was your service in the military?

DUNN: Well I was drafted ^{to} in the Army and I was in the infantry.

EVERBACH: Did you see action, or were you mostly stateside? What happened?

DUNN: Just a second. I'm sorry. I had to leave the phone for a second. Go ahead.

EVERBACH: That's fine. What action did you see in the military, if any?

DUNN: Well I was in Europe, and a little bit ^{Belgium} of the Bulge, and a few things like that.

EVERBACH: You don't have any interesting stories to tell about that?

DUNN: Except it was a cold winter. '44 was a cold winter. I was cold the whole winter.

EVERBACH: And then I guess the war ended the following summer.

DUNN: The war ended in '45.

EVERBACH: Yeah, the following summer. So you came home to Kansas City.

DUNN: Right.

EVERBACH: And then was it the GI Bill that took you to Illinois?

DUNN: Right, right. I came home in early '46 and went to Illinois. I think the first semester I could get in was that Fall.

EVERBACH: And you mentioned that you went because you had heard it was a good place for electrical engineering, so someone must have gotten you interested in electrical engineering and pointed you toward the University of Illinois.

DUNN: It was my Physics teacher at junior college, *Dale Leese*. _____

EVERBACH: OK

DUNN: I mentioned that I think he may have gone to summer school there, and maybe gotten a Master's degree or something like that.

EVERBACH: Now this is a question I think I know the answer to, but it's on the list. It says, "When you were a student in college, did you ever participate in a rally or protest or have a cause?"

DUNN: Have a what?

EVERBACH: A cause. A protest or a rally or was there a cause. Was there anything you felt passionate about, I guess, as a student?

DUNN: Well, undergraduate probably not, but when I first became a graduate student, there was a movement to get people to sign a loyalty oath.

EVERBACH: Yes. That would have been the Red Scare years under McCarthy.

DUNN: Right. I think I had just become a graduate student and I protested against that, with others of course. Any ~~by the way~~, the University of Illinois didn't have it, probably because of that protest.

EVERBACH: Ah, OK. Now did you go on to graduate training for a Master's degree or did you go right on for the PhD?

DUNN: No, at Illinois you had to do a Master's first, and I did.

EVERBACH: OK, how were you supported during that time?

DUNN: I was a research assistant.

EVERBACH: For whom?

DUNN: Under Bill Fry.

EVERBACH: And you ~~you~~ remember any specific projects you worked on during those years?

DUNN: Oh yeah, I remember all of them, probably. The first thing I had to do was design a double crystal acoustic interferometer. And then I got it built, and I used it to make measurements of the speed of sound as a function of pressure and temperature in ammonia gas.

EVERBACH: OK, did you do a Master's thesis?

DUNN: Yeah^S, that was it. It was on that.

EVERBACH: OK, and so your advisor, Bill Fry, was the main influence on you at that time?

DUNN: That's right, no question of it.

EVERBACH: So then you continued on for a doctorate at Illinois, correct?

DUNN: Right, right, yeah^S. They asked me to stay on, so I did.

EVERBACH: So what was your doctorate thesis or any projects you did for a doctorate?

DUNN: Well, I had just begun to get involved. I'm not sure I had a great interest but I was involved in biological materials and I was given the topic of trying to make measurements as a function of temperature of, I'm not sure how to describe it just now, of the ability of tissue to be affected by ultrasound. I played around with it and I came up with a wild idea, and it actually worked. Trying to change temperature of a mammal can be done but it is kind of difficult to do and to keep the animal surviving and all that. I never took any courses in biological subjects but I sat in on a lot of ^{them} things, and one time when I was sitting in on such a class, the lecturer used the term (~~oh heck, just a second~~ ^{probably there})

EVERBACH: Just go on, we'll come back to it.

DUNN: It had to do with the change of ^{body} temperature of newborn mammals.

EVERBACH: Yes, neonates.

DUNN: Neonates. And so I learned how to handle neonate mice and I set up a colony of ^{adult mice} them, and had them producing a lot of young mice, and then I irradiated them and I had a way of testing whether or not I affected them by the radiation by electrically stimulating their feet and so I essentially gave them a shock with a volt-and-a-half battery. I could test very quickly whether or not I affected them. And essentially that was the gist of my experimental work.

EVERBACH: I just want to confirm, when you say irradiate, you mean insonify, radiate with acoustic radiation, not ionizing radiation.

DUNN: Right.

EVERBACH: While you were a student, did you start teaching as a graduate student?

DUNN: No I didn't. Bill Fry had a lot of money. This was a very interesting time. Before I became a graduate student there was no such thing as NSF or NIH. I mean, there was an NIH, but NIH did not have an extramural ^{research} program. Until about the time I became a graduate student and NSF came into being, and so those who were pretty alert to what was going on were able to get funds pretty easily. And Bill Fry was one of those. So he was getting a lot of funds and he needed students or he needed help in the laboratory and so I was asked to stay on and do that and so I didn't teach. *I was a Research Assistant.*

EVERBACH: Then after your PhD, did you immediately start teaching then at the University of Illinois?

DUNN: Well, everybody at Illinois taught, at least in the College of Engineering, and so I had to do my teaching which meant teaching one course a semester. And I did that.

EVERBACH: What course?

DUNN: It was a course in electromagnetic theory.

EVERBACH: I guess you worked right on through. You were an assistant professor, then stood for tenure, I suppose, and then moved up the ranks. Is that right?

DUNN: That's right.

EVERBACH: You stayed there all the way through until the end. You were a lifelong University of Illinois fixture. What was your total years there, do you know? Did you count them up?

DUNN: Well I went there in '46 and left in '96.

EVERBACH: OK, that's pretty easy to calculate. That makes it 50.

DUNN: (laughs) that makes it easy.

EVERBACH: I know that you have lots of publications, and that's the kind of thing that the Acoustical Society can dig up. Did you ever write a book, or something like that, as well as just research publications?

DUNN: Well, I edited several books. There was one book that Lindsay got a number of people in the Society to edit books for some publisher, I've forgotten the publisher's name now, and I did, and I had Bill O'Brien help me out because I went on sabbatical, and couldn't handle everything.

EVERBACH: Now, were you ever department chair or anything like that?

DUNN: No, I refused to be considered.

EVERBACH: So you didn't actually hire Bill O'Brien, or Leon Frizzell, or those other guys.

DUNN: I did hire them.

EVERBACH: So even though you weren't department chair, you hired them?

DUNN: That's right, I, well, I got the department head to agree. Whatever you want to call it. I considered that I hired them.

EVERBACH: You recruited them.

DUNN: If it hadn't been for me, they wouldn't ever be there.

EVERBACH: So you recruited them, is the best way, I guess, to put it.

DUNN: Yeah, if you like.

EVERBACH: So, are there anything else you'd like to tell me about your research accomplishments during your 50 year career at the University of Illinois? What do you consider your greatest accomplishments or what areas do you feel were your strongest suit?

DUNN: Well I feel like I just worked on the same thing all the time. I was just concerned with the biological effects of ultrasound. I spend a lot of time measuring the speed of sound, absorption, attenuation, scattering, things like that, of ultrasound in various media. I guess I could say all the way from the molecular level up through the whole-animal level, if you could use those terms. I actually studied this in terms of biological molecules, mostly solutions but some of them wouldn't dissolve so they were suspensions, all the way up to the whole animals, living, breathing animals. This is what I did. My publications, I suppose, show that, if you dig them out.

EVERBACH: Yeah. In more modern times, we talk about the two categories of mechanisms of ultrasound action on tissues as being heat deposition and mechanical or cavitational activity, and you contributed to both sides of that, didn't you?

DUNN: Well, for the most part, I tried to avoid cavitation as much as possible, because it was easy to produce, and if you didn't watch out or prepare things too well, you'd always have cavitation when you didn't want it. So I spent most of my time trying to avoid having cavitation present by preparing the medium that was being irradiated and all that stuff in ways that, if you were lucky, you'd be below the level of cavitation.

EVERBACH: I know a lot of your work did deal with hyperthermia or maybe hypothermia and other areas: characterization of tissues in a variety of ways, and of the ultrasonic action on those tissues.

DUNN: Yeah, that would be a good way to describe it, I think.

EVERBACH: Let me ask about your family, if you don't mind. Again, I'm not being nosey, I'm just asking the questions that they've given me.

DUNN: I understand.

EVERBACH: What is your marital status? What is your spouse's name and occupation? Where and when did you meet your spouse, when and where did you get married, what about children? And is there anything about your family that you'd care to mention?

DUNN: Well I'll try to deal with all those questions. Elsa and I, we met at a wedding in 1949 and we were married in 1950, I think in the month of June both times. And we've been married 59 years now. Elsa never had any real occupation, she would mostly be called a homemaker, but now she spends a great deal of time dealing with computers. Actually, she does all the computer work for me.

EVERBACH: OK.

DUNN: The only time that she didn't is when I made computations, and I haven't done that in a while. We have two children. Our eldest, our daughter, is named Andy^t, Andrea, and she lives in Oak Park, Illinois, and has three children. She got her Ph.D. in Linguistics. Her husband is an engineer. Groundwater is his main interest; he's a civil engineer. Our son had his career mostly in the theater, in management, stage management.

EVERBACH: What's his name?

DUNN: His real name is Louis Brook but he has the nickname Roo that he goes by professionally. He's essentially been in the theater all his life, until recently anyway. He lives in Bath, Maine. Did I answer all the questions that you asked?

EVERBACH: I think so. The last category is personal interests. If you have any favorite authors, or books, or movies or TV programs or sports teams? Anything related to your interests in that category?

DUNN: Well I've always had a very special interest that no body else cares about, although I haven't pursued it much recently: I've been a student, so to speak, of James Joyce.

EVERBACH: OK.

DUNN: I read his stuff as much as I can but as I said, I haven't done much lately. That's probably the only hobby I've ever had, I guess, other than I like to get out and move once in a while.

EVERBACH: Yeah. You're not a musician, though?

DUNN: No, I'm not.

EVERBACH: I just mentioned that because a lot of acousticians are, but not everybody.

DUNN: Right, I understand.

EVERBACH: Well, I've come to the end of the list they wanted me to ask. Is there anything you can think of... The recording of this is going to be transcribed and I'll send you the recording and the transcript to mark up, then the revised version will go into an archive for anyone, I guess, who is interested in your history as described in this conversation. Is there any main area that we didn't talk about that you think should be mentioned?

DUNN: Well, I think you covered things pretty well professionally. I was thinking that the Society does have some biographies of me that were compiled for various reasons.

EVERBACH: OK

DUNN: And I don't know how you get them, but I imagine that Elaine knows how to get them.

EVERBACH: Yeah, for instance, you were president, but I believe you got a gold medal, did you not?

DUNN: Yeah, I got a gold medal, and I got a silver medal.

EVERBACH: Right, so there would be encomnia that would include some of this information from those awards.

DUNN: Very likely. And I was president and vice president, and that was it. I might say that the award that I got, at least they call it an award, that was most significant for me, and the one that came in second, was being made a member of the National Academy of Sciences, and also National Academy of Engineering.

EVERBACH: Do you remember when that was? I can find out.

DUNN: I think I became a member of the National Academy of Sciences around 1990 and I think the National Academy of Engineering ^{was} about '82.

EVERBACH: OK, well Floyd, that's all the information that I need to get right now. You and I can interact later, but I will go ahead and conclude this phone call now and thank you for your time, and then you can expect to receive a transcript of this from me at some point soon.

DUNN: Thanks very much.

EVERBACH: Thank you, I appreciate your taking the time. Have a good day.

DUNN: Bye.

EVERBACH: Bye. This is Carr Everbach, and I'm signing off. It is 5 o'clock.