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ORAL HISTORY PROJECT

INTERVIEW WITH

DELBERT PHILPOTT, M.D.

June 3, 2004

Delbert Philpott, Ph.D.

Biographical Statement

Dr. Philpott was born on September 24, 1923, in Loyal, Wisconsin. He earned his B.S. and M.A. degrees in chemistry (1948 and 1949) at Indiana University and his Ph.D. in cytology at Boston University (1963). During World War II his U.S. Army infantry unit was the first to link up with the Russians at the Elbe River in 1945, a momentous event that signaled the end of the war. That event continued to be meaningful in Dr. Philpott's career as a National Aeronautics and Space Agency (NASA) scientist, when his historic WWII link with the Russians became the catalyst for several endeavors involving cooperation between the Soviet and American space programs.

While at Indiana University Dr. Philpott learned electron microscopy techniques, and subsequently (1949-1952) perfected them as a Research Associate at the University of Illinois Medical School. In 1952 he became Head of the Electron Microscope Lab for Albert Szent-Györgyi's Institute for Muscle Research at Woods Hole, Massachusetts, a position he held until 1963. He then became Assistant Professor of Biochemistry at the University of Colorado Medical School, and then, in 1965-1966, Head of the Department of Electron Microscopy for the Institute of Biomedical Research at Mercy Hospital in Denver, Colorado. In 1966 he became Head of the Electron Microscopy Lab at NASA-Ames Research Center, Biomedical Research Division, Moffett Field, California. Dr. Philpott has won numerous awards for his many contributions to the field of electron microscopy and has been active as an officer and member of several professional societies.

Interview Synopsis

In this lively and anecdote-filled interview, Dr. Philpott describes daily life at Albert Szent-Györgyi's Woods Hole laboratory from the years 1952-1963. As a year-round employee of Woods Hole's only year-round (then) lab, and as the institution's expert on electron microscopy (a resource whose use was sought by the entire facility), Dr. Philpott was in a unique position to observe the rhythm of the small community's summer seasons and "off" seasons, especially the annual influx of scientists for summer work. He also offers several insights into the organization and administration of Woods Hole Marine Biological Laboratory in those years.

Through numerous examples, Dr. Philpott illustrates Albert Szent-Györgyi's unique outlook on life, his sense of humor, his scientific acumen, and the various ways in which his assistance and support inspired loyalty among those who worked with him. In the course of this recounting, Dr. Philpott describes several scientists who visited Szent-Györgyi at Woods Hole or who worked with him for varying periods of time in the 1950s and early 1960s. These descriptions include not only the subjects of their research but also some of the informal parties and recreations that Szent-Györgyi regarded as vital for morale as well as for the rejuvenation of creative thinking.

National Library of Medicine Oral History Project
Interview with Delbert E. Philpott
Conducted on June 3, 2004, by Adrian Kinnane
in Sunnyvale, California

AK: As I mentioned, we'll get a conversation going here between the questions I have and the points that you have prepared. Thanks for doing that, by the way.

DP: Yes, sure.

AK: Now, you were fourteen years old when Albert Szent-Gyorgyi won the Nobel Prize for his work on ascorbic acid.

DP: That's interesting.

AK: And then when you were twenty-nine, in 1952, was when you moved to Woods Hole from a position at the University of Illinois Medical School, where you were developing and applying techniques of electron microscopy.

DP: Right.

AK: How did you learn of the position at Woods Hole? How did you come to be there?

DP: Oh, that's really interesting because I got a call from somebody that worked at another school in Chicago, I'm sorry I've forgotten his name, and he said that he was in an electron mic lab and needed to learn something about electron microscopy and understood I was making some breakthroughs on sectioning, because we couldn't cut ultra thin sections yet. They had techniques and could he come and learn a little something from me, so I said, "Sure."

So he came over, and for a full day I raced around knocking myself out to teach him. Near the end of the day he smiled and he says, "Well, actually, I know a lot of this stuff, but I got a call from Dr. Albert Szent-Györgyi saying he's looking for an electron microscopist and I've actually been interviewing you. [laughs] He said, "How would you like to work for Dr. Szent-Györgyi in Woods Hole? I was standing there with my mouth hanging open, thinking, "Hmmm, sounds like a pretty good idea." Prof wrote to me then and the reason that I felt I just had to go and work for him is he, in the letter he hand-typed, there wasn't room for the period at the end of the sentence, so he put the period at the beginning of the line for the next sentence. Now, I all my life have looked for the little things people do because it's the key to their true personality. When I saw that, I can remember saying, "Got to work for him."

AK: Tell me why. What did that tell you?

DP: It told me about his personality, and that he was just a really straightforward, normal honest guy with no pretense, but he was going to get to the point of really what he was doing. I felt,

"Boy, I've been at the University of Illinois for three years. It's all back- biting. People are having heart attacks. If you make a change in a little book or something, and you don't go properly through every channel, it's hell to pay for months and months." I said, "I just couldn't believe that adults can behave the way that people have been behaving at this university." I said, "It's got to be the life I'm looking for."

AK: Okay. Had you known of Szent-Györgyi before this?

DP: Oh, yes.

AK: How so? Through what?

DP: Well, the fact that he won the Nobel Prize in chemistry. I actually—because I did not have a Ph.D—I left with a Master's degree from the University of Indiana, with the idea that I could be a big fish in a little pond if we could break through on ultra thin sectioning. I always believed anything the mind can think of, the body can do. Therefore, it can be done, even though the Chairman of the Department of Chemistry at IU called me in when he found out what I was going to do, and bawled me out. He says, "You're an idiot, you know, for doing this. In two years that microscope will disappear. It will be obsolete. It will be gone. You will have thrown away a promising chemistry career." Nothing made me more determined to go, and he says, "And besides, you'll starve." Well, for the three years I was

there I starved at three hundred a month, but I published a paper that Prof had seen and that was what got Prof to that guy to me, because it had muscle pictures in it.

AK: Okay.

DP: And when I got the letter from him, I said, "I'll send you pictures so you can look at them." I belonged to a photography club and had always been interested in and good at photography and I was entering international competitions, so I knew how to really print. So I sent him 16 X 24s with number fourteen prints on it, but it took a couple weeks. Well, in that length of time, Prof sent me a letter and said, "Don't call me, I'll call you," and my friends said, "Oh, that's too bad. You lost the job." I said, "Like I hell I did. He gets the pictures, I'm going to hear from him." [laughs] Zoom—"Come out immediately."

AK: So you went there and that was your first meeting with Szent-Györgyi ?

DP: The first one and it was very informative because when I got there, he sat on the porch in there and there wasn't another chair right by him, so I sat on the floor by his feet.

AK: Was this in his house or . . .

DP: In his house there, Seven Winds, and I said—he started to talk and I said, "Wait a minute." I said, "I've got to tell you something up front. I don't have a Ph.D. and if that Ph.D. means

something to you, I don't want to be interviewed under false pretenses. I want you to know right away, because where I come from, at the University of Illinois, even at lunchtime everyone has to sit according to rank. The lowest on one end, the chairman on the other," and I said, "It's that kind of a life." He put his arm around me and he says, "I'm looking for brains. I'm not looking for paper," and he says, "If things work out, I will help you get your Ph.D."

Ten years later, after I'd published fifty papers and we'd had a lot of fun, especially with that—I got to tell you that story—he came in with a smile on his face and he says, "I'm only one person. I only have a small institute. I'm really working on cancer, not muscle," and he says, "It's time in your life to get your Ph.D." Then I went up to Boston University. A guy hired me part time because I had to have a job, but it was a fake. He was trying to play me off at Mass General Hospital to get to the [electron] microscope. I don't know why, but he was on the outs with everybody up there and he thought he could do that. Well, he couldn't.

AK: This is the guy who hired you at BU?

DP: Yes, and as each week went by, my money was disappearing, so I went into the Chairman there at BU in the Biology Department and I said, "Look, this guy over at Mass General hired me and we haven't seen him. You've got to call him on the phone right now. You've got to

make him come over here and we've got to face him down. Either I have a job or I don't." So he called him over and the guy had to admit he didn't have a job.

So then I didn't even sleep that night, and the next day I went back to Woods Hole, went back to Prof and I said, "I'm in trouble. I can only make it to the end of the semester." I told him what happened and I said, "I spent the whole night trying to figure out what I might be able to do," and I said, "If I can work for you three days a week, one of them can be Saturday if necessary, but I'll give you your full amount of time, and then work in the summer like I did before running the electron mic lab," I said, "I can make it." He put his arm around me—geez, it almost brings tears to my eyes even now. And he says, "Are you sure that's enough?" God, I really choked up, but like he said, he would help and he did.

AK: This was 1960 to '63 period?

DP: Yes.

AK: Let's go back a bit. I was going to ask you what your first impressions of him were, but you had already formed an impression of him before you even met him, based on the way he wrote that letter, he typed that letter.

DP: Yes, yes.

AK: How about when you met him, how did he strike you?

DP: Well, when we were there on the porch he said, "I have a better place for the interview, come with me." He threw a bathing suit at me, and I hadn't eaten supper. I hadn't eaten breakfast. I was hollow, thank God. I couldn't sink. He says, "We'll swim out to the raft and we'll have the interview on the raft." So we swam out to the raft. He was out there way ahead of me. I finally made it, gasping, got up on the raft. He said, "What do you think," and I looked around and I said, "Dr. Szent-Györgyi ,"—I hadn't established that he was "Prof" yet—"this is the most clever interview I've ever been on. Those that don't make it to the raft drown, go out to sea. It's all taken care of. Those that make it probably work for you." Again he put his arm around me. He said, "You're going to do just fine."

AK: He was sixty-two years old about at that time.

DP: I guess.

AK: He was always pretty healthy, wasn't he?

DP: Oh, yes. Have you been out there at Penzance Point?

AK: I have not.

DP: Well, it's very narrow. One of my pictures will actually show it. He calculated that as the tide goes through, if you just swim out to the tide, it will take you through to the other side, and then you just have to swim back. But he forbid any of us to try it. He said it was too dangerous, but he was really healthy. In fact, he took me fishing, you know, right there, just for a little bit to show me what's doing and he whipped back—he had given me a pole and he had one. He whipped back and gave it a real hard whip and it broke his pole. He looked at me and he says, "Now, aren't you glad you're not the one that broke it?" He says, "I can't yell at myself, but I could yell at you." [laughter]

AK: Well, now, you started there at Woods Hole working for the Institute for Muscle Research.

DP: Right.

AK: But you were year round.

DP: Yes, I was year round and the deal was that I would work for the MBL in the summer, and I knew enough . . .

AK: The Marine Biological Laboratory?

DP: Yes, and I knew enough to immediately say to Prof, "The best way to arrange this, if you can, is to have one person pay me year round. If it's possible, then I'd like to have you be the one

that pays me the year round, while I work for the MBL." And he said that's the way he had planned to do it, and it was excellent because people would come and, as I told you, at that time I didn't have a Ph.D. They would go to the library and the librarian would always tell me about this. They'd come in and want to look me up to see what I had for degrees before they came to work with me. Then they would decide what they wanted me to do and they would go to Prof and tell Prof that "This is what I want you to tell Philpott to do," and Prof would say, "Why are you coming to me? He's running the lab. He has complete authority over it. I have none. What he says goes." So then they would come in sheepishly and talk to me. That worked. It worked perfectly.

AK: You mentioned before we started recording an arrangement whereby the Institute for Muscle Research had paid for the electron microscope, but the professors or researchers who were there during the summer would use it.

DP: Right. I'm not sure who paid for the electron microscope. I know that Dr. Parpart at Princeton and Dr. Jim Hillier at RCA wanted to have an RCA microscope at the MBL and Dr. Szent-Györgyi was supporting the idea. Dr. Hillier actually came to the MBL and was installing it when I came there. He was the major designer of that microscope and let me help him put in the latest design improvements which weren't even on the commercial ones. I'm sure that RCA made it easy for that group to purchase it. I was really lucky. After he went over my background, he said, "If there is anything you don't know, I'll teach it to you. You'll do just fine."

AK: And then for the rest of the year it . . .

DP: Nine months in the year it belonged to the Institute.

AK: Right, who had paid for it?

DP: I think that RCA wanted to get a microscope into the MBL.

AK: I see. Okay.

DP: And they made a deal with the MBL and got it there really cheap.

AK: I see. So you would then operate it for researchers during the very busy summer months.

DP: Right.

AK: And in return the Institute for Muscle Research had it the rest of the time.

DP: The deal was that I had to run it, even though somebody might come in that had experience running one because we had to have it unbroken in the fall.

AK: Yes.

DP: So I ran it, and boy it was tough to handle that many people. At the end of the first summer, Prof offered to buy me a sun lamp. I hadn't been on the beach once.

AK: My goodness.

DP: I would use the weekends to do the repair and the cleaning and all the stuff that needed to be done. I felt I was representing Prof as the person that was in there, and anything I did could reflect on him and I wanted it to be the best it could.

AK: Yes. What were relations generally between the IMR and the MBL? Cooperative? Cordial?

DP: Yeah, it was good. It was good.

AK: It sounds as though this arrangement about the electron microscope was sort of an example of how things worked between the two?

DP: That brings up a point that I think will help to illustrate one of the major things you're looking for, and that is how did Prof get people to be so intensely loyal. I didn't have a Ph.D., remember? Whenever I met the Director of the MBL in the hall, he never looked at me, he never spoke to me. I was nothing with him. Now, Fritioff Sjöstrand was the first to cut ultra thin, really ultra thin sections and became famous at that time for doing it. I felt he

would be an excellent candidate for a Friday night lecture at the MBL because they had important people Friday nights all through the summer.

So I wrote to him and asked him if he would be interested and he said, "Oh, yes, I'd really be interested in coming up there, and can you introduce me to Szent-Györgyi because he's been a hero of mine?" I said, "Oh, sure, I can do that." So he got invited to come and give a Friday night lecture, and I also introduced him to Prof. Prof said, "Well, I won't be there. When you get through with your reception, I'll be home, but come on out. I'll have things fixed up for you." So I stood in the back of the hall, not invited to the reception and Sjöstrand, when he finished talking, rushed back and got me and says, "Let's go to my reception." I said, "I'm sorry, but I haven't been invited."

So the MBL Director came back to Fritioff to take him to it and Fritioff says, "Well, Philpott's coming to the reception, too, isn't he?" and the Director looked at me and he says, "I'm sorry, but he's not wearing a tie, so he can't come." Fritioff took his tie off and put it in his pocket and says, "I'm not wearing a tie, either." And so the Director had to say, "Well, um, eh, em, uh, well, yes, of course you're going to be able to come." So I did, and of course, Fritioff is now staying out with Szent-Györgyi 3.. He gets there, Prof is in bed, on the chalkboard it says, "There's a flashlight tied to a string. Take the flashlight, follow the string, go up the stairs and it's tied to your bed. I'll see you in the morning." [laughs]

Now, comes, you know, what you're looking for. He told Prof what had happened. Now, a boss can, if he wants to, go to the guy and chew him out, right? But not Prof. That's not how he worked. I got an invitation to come to a beach party with Fritioff, the director of the Naples Marine Biological Laboratory, director of one on the east coast. The Director of the MBL and two Nobel prize winners. And me. He never said a word to the Director, but implied by his action that, "This is my boy, and he's equal." After that, when I walked down the hall, whether it was a crowd or a single, there was a smile on his face. He stopped and he talked to me. Now, that's I think as good an example as you can get why you would be fiercely loyal.

To give you another touch to it, later on I was on an airplane coming back to Boston, sitting aside of somebody I'd never met. "Where do you work?" "Woods Hole, work for Prof." "Oh, Prof. I hear he's blah, blah, blah." Well, immediately in my mind I said, "Well, this is the only thing I'll ever be able to do for Prof is defend him if anybody tries to knock him down, see?" So I—as far as I can remember, I enthusiastically straightened him out. Two days later I'm walking down the hall and this guy's in there talking to Prof. "Geez," I said to myself, "this guy's got nerve, the attitude he had and he's here talking to Prof." After the guy leaves, Prof comes running down to my lab with a big smile. He says, "Del, I don't mind if you straighten people out, but I wish you wouldn't threaten to beat the hell of them." [laughs]

AK: That is loyalty. I'd like to talk about two big topics now.

DP: Sure.

AK: In the course of that, maybe we can fit some of the topics on your list.

DP: Oh, sure.

AK: One would be the actual work and the kinds of projects that you were doing with Szent-Györgyi at the IMR, and the other one is the style or the atmosphere of the lab, the kind of things that went on, both during and after work. Maybe we could start with the kinds of projects that you were working on with him during those ten to thirteen years that you were involved.

DP: Yes. Well, I went there of course with the idea it was the Institute of Muscle Research and Prof was working on muscle and had come with the idea of glycerinating muscle and it still would work. So I worked on glycerinated muscle, the structure of glycerinated muscle and then I got to working with Csuli who isolated light meromyosin. That was a protein and it was dogma that a protein so highly hydrated could not be dehydrated and photographed in the electron microscope. It took me a year of trying everything I could think of, including checking the tide tables—[laughs] honest to God! You know, the temperatures, anything we could think of I kept trying and trying and trying and trying, until I finally succeeded in getting the pictures of the light meromyosin. I had carefully calibrated the electron

microscope and then I took lots of pictures to get the average. Came up with 420 angstroms, I think it is, for the period. We published. That was kind of a sensation.

AK: This is Csuli or Andrew, Albert's cousin Andrew Szent-Györgyi .

DP: Yes. He was like a brother to me. And a year later, was it MIT? No, Mass General, I think, did the x-ray work on it and of course the x-rays are going to be exact, and I think I was within three or four angstroms and they sent me a letter saying, "We thought you'd like to know…" Those are moments you don't want to work anymore that day for fear you'll hurt yourself. [laughs]

AK: Can't get any better. It could get worse. So your work primarily was with electron microscopy and the extent to which that was applicable to a variety of research projects that were going on.

DP: Well, yeah, because I worked with the people that came in from all over the world.

AK: Right.

DP: And actually published with a number of them because they felt I'd made it successful for doing it. Worked with George Wald who later got a Nobel Prize for his work on the retina. We found the periodicity in the retina, independently of Sjöstrand and had written it up for

publication when Sjöstrand's publication came out. [laughs] He scooped us. But it was a lot of different people and they were coming from, you know, Japan, Italy, France. You name it, they were coming from all over, and in the summer I literally didn't get out of the lab, so I didn't really even see Prof much.

So I got an idea, so I got some postcards and I said, "I'm having a fine time here, wish you were here," and addressed them to Prof, and when they would leave to go back to their country, I'd say, "Would you mail these for me?" [laughs] It happened that two or three of them came in pretty close together and he came roaring into the electron mic lab one day and he said, "Oh, you're here. Oh, ya, you are here. You really are. Yes, you really are here. You are here, aren't you?" I kept sitting there smiling and finally he just shook his head and he said, "Hmm, not bad," and walked out. [Laughs]

AK: He had a sense of humor.

DP: Oh, yeah.

AK: You had mentioned that April Fool's Day was a big day in Hungary.

DP: Oh, yes, and of course he made it a big day over here with our group—anything that could add to the esprit de corps of a small group. See, I'd once asked him, "What's your secret of success with this group of people?" because I'd come from the University of Illinois where it

was, you know, dreadful. He says, "Well, it has to be run like a family," and he says, "When I interview someone, I don't interview them just for what they know. I have an eye on them for how they're going to work out as part of the family, and they've got to pass that part in order for me to have them come here."

AK: And to keep morale up, for instance, if people weren't working as hard as they should or as hard as he thought they could, he wouldn't chastise them. Instead . . .

DP: No, never.

AK: Instead he would . . .

DP: He felt that things—he said, "It's a sine wave that's going on." He said, "It's time to have a party." So then he would throw the party out there at his place and of course invite people from different places. It would be a big group with a lot of people that are well known and would come to it. You'd have a marvelous time. Your enthusiasm for your group obviously came way up. Like I was saying, it would spill over so completely that on Monday when we'd be working, we'd be saying, "Well, we know we've been had, but there's no other place you could be had like this! We're going to work."

AK: Positive motivation.

DP: Positive motivation. He was really astute in those types of things.

AK: And you're another example of that, perhaps. Your office was down the hall from his?

DP: It was on the second floor, and he was on the third floor.

AK: The third floor.

DP: So he would go down a floor and then come down a little ways, and then come into mine. When he came in looking for me—one time, remember, it's a big place and to get any supplies, you had to get down the basement over to supply and see if you could get like radio tubes or something like that, or another place had all the chemicals. So you weren't always in there and there was nobody else working for you. So you're not there, and one time he finally found me and he kind of blurted out, "Well, I've been looking all over hell for you," and I said, "Maybe that's why you didn't find me. I wasn't there." And I said, "Well, I'll think of some better way."

So then I made a card that had a dial on it and as you turned the dial it would say "Library," "Supply," whatever. So any time I left, I would just dial that, so that anybody that came looking for me could look at it and see it, and I learned something about human nature. I left a blank so that I could fill something else in. You're ahead of me. Every wise guy started filling it in, see, so I couldn't do that anymore. [laughs]

AK: You had a great view, I think, right out the window?

DP: Fantastic out there. You look out at Martha's Vineyard. I would see the sailing boats. A lot of them were Cape Cod knockabouts which I guess was the most popular sailing boat and maybe still is, and I thought, "Well, everybody has one. When somebody comes, they take them for a ride. I'll have to learn." So I got somebody to take me out. I got salt spray in my sunglasses, so I couldn't see and the boom hit me in the head twice. I had a headache. We came in. We had a lot of work to do with drying the sails and stuff. I looked up and an airplane flew over and I said, "That's the way I'm going," and I bought an airplane.

AK: And you flew many of the scientists who came to Woods Hole? You took them on a trip?

DP: Oh, sure. Talk about motivation. Paul Gross, who later became a director at MBL, was a very good friend of mine. We published some stuff together, spindles and liver regeneration and stuff, and I said to him—"Now, I helped build this small, little one-strip airport at Falmouth. A few of us have airplanes there. If you'd like to take your coffee break in Martha's Vineyard, I know how to do it." We'd come in an hour early in the morning, start work. Gets close to coffee time, we hop in the car. We go out to the airport. We grab my airplane. The minute I get up in the air, it's eight minutes from one airport to the other, I call on the phone. I've got an arrangement with them. They answer me in the cafeteria. I order what we want. I tie up the airplane. It's sitting on the counter when we get in there. We have our coffee. We get back out, get in the airplane, come back. We'd

come back and a lot of times people would come in like, oh, ten thirty, quarter of eleven and say, "How about going down to the drugstore for a cup of coffee?" and we'd smugly say, "No, we've already been to the Vineyard for ours." [laughs]

AK: Did you ever take Szent-Györgyi up in the airplane?

DP: No. He never asked. I was always afraid to ask him. Being the boss, I felt it was up to him if he wanted to go. I never took Csuli because being a relative of his, it wasn't that I didn't want to take him. I would love to have taken him. We were very close. I made semi-subtle hints about going here, going there and so on with it, but he never took me up on it and I was so afraid. You know, I was a commercial pilot and I could fly for a commercial airline if I wanted to, and I even taught flying some. There were a billion to one odds against an accident and I still didn't want to play them. If he'd really wanted to go and asked me, then we would have gone. But just about everybody else went up.

In fact, Alfred Chaet's wife would meet him at every airport when he came home from every lecture, with a newspaper under her arm, tears in her eyes. There was some air crash in Timbuktu she had found and she was a basket case. He said, "What will I do?" I said, "Wait, she's never been up. If she goes up once, it will cure her. Bring her out to the airport, but don't tell her we're going to take her flying." So we get a crew to go out, there's a bunch of people. She's among the people and I explain the airplane to her and so on and

then I say, "Well, I'll take up one group. Then I'll come back and I'll explain a little bit more about the airplane."

Well, when I took off, I realized it's lunchtime. So I called Martha's Vineyard, they packed a lunch, went over and landed, picked up the lunch, came back, got out of the airplane. I got out. I had hamburgers, I had malted milks and it just blew her mind. She could not figure where in an airplane gone for the exact number of minutes I told her we'd be gone so she wouldn't have a newspaper under her arm. Now, while she's totally bewildered, I'd say "Well, let me show you some more about the airplane." I said, "Why don't you get in, so I can explain the instruments." So I explain the instruments and this is how we start, and I started it, and I just kept her occupied. I taxied out. I took off with her, did a very soft, careful ride around, came back, kept talking, landed, talked some more to her, let her out. She was cured.

AK: I wanted to get back to the view from your office because Szent-Györgyi told you . . .

DP: "You're recharging your battery."

AK: If he ever catches you . . .

DP: He stood right beside of me and he pointed out there at some of the sailboats. He said, "Any place else, if I walked in and you were working for me and you were just staring out the

window, you'd be goofing off and I'd have to say something. But here," he says, "I know that when you look out there, you're recharging your battery."

AK: Now, I suspect he did something similar, that he enjoyed moments of thoughtfulness, and that not all work occurred staring through a . . .

DP: Well, he told me that the reason he—see, he said he had half of his Nobel Prize money left when he came here, and when he saw the house for sale on Penzance Point, even though it would cost him a lot, he immediately—this is part of his genius–he could always make the right decision immediately. He immediately said to himself, "This is the spider web that will be the best place I can ever be because no one will be able to come out here, stay here, listen to the seagulls calling, the buoy dinging out in the ocean and not say 'this is the best place for original thought that anybody could ever find.'" And he said, "This will really be the spot. It will help everyone, including myself," and it was true. You know, you go out there and it was just fabulous.

AK: Yes. Now, he never accepted, and I suspect maybe wasn't interested in formal academic appointments anywhere.

DP: Princeton offered him—when he came over looking for a place, Princeton offered him a blank check, if he would come there, and he said, "Along with the blank check, you're offering me every committee you can put me on, and then I haven't got time to work." He

said, "I want some place where I can work," and when he saw Woods Hole, it was ideal but nobody would give him any money. Now, Stephen Ráth, and his pictures are in here some place . . .

AK: Yes.

DP: Was a pharmaceutical millionaire in Hungary, grabbed by the Russians and hauled off to Russia. Prof wrote to Stalin and said, "My friend, Stephen Ráth, is in Russia and I want you to let him out, and if you don't let him out, I'm a Nobel Prize winner, I'll tell the world and the world will listen to me." Out came Stephen Ráth , see. So he freed Stephen Ráth , who still had access to some of his money, so to get started in Woods Hole, it was Stephen Ráth who funded Prof. Then Prof went to Armour. They called it meat and he called it muscle, and so Armour—and I may not be right on the money, but I think it was like a hundred thousand a year that Prof got from them to fund his research and his institute while he could build the institute and get funding.

AK: Yes.

DP: So he could get the funding coming, because I remember one time there was an Englishman that had a little MG with the top down and he would pick up the mail and then zoom over to the lab and there where the inlet comes in and the Coast Guard is, the road drops off very rapidly. Well, the wind blew all the mail out and a check for twenty-five thousand was in it.

So he rushed the rest of the way to the MBL and reported it, got everybody at the MBL to come down and start going down the hill getting the mail, collecting it until we found the check. [laughs]

AK: I like the way you put that: they called it meat and he called it muscle. [laughter]

DP: He sent me to Chicago to get samples of light cutter and dark cutter meat because it tastes exactly the same. Everything is the same except looks. Now, they could not sell the dark cutter meat for anywhere near the price they could sell light cutter meat. The only sort of clue they had was in shipping maybe it got banged around and so on. So the idea was to look at the muscle under the electron mic, as well as him with biochemistry, to see if he could solve the problem of light cutter, dark cutter meat. So that was one thing that was being done for Armour. I looked at it structurally and it was identical, which you'd probably expect. However, it did precipitate osmium tetroxide, which the light cutter meat did not do. So it was a chemical indication that something had changed that way.

AK: Was there any practical benefit to Armour that came out of any of this?

DP: Well, I was only involved in it from that standpoint. He went and gave a lecture or two or something like that with Armour. I really don't know.

AK: There was funding also from the American Heart Association.

DP: Oh, yeah. When he got rolling, he got lots of funding coming in.

AK: And in 1954 he won the Lasker Award, and you were there then.

DP: Uh-hmm.

AK: Can you tell me a bit about that? There must have been a celebration.

DP: Well, yeah. You have the pictures. You have the pictures of the celebration for it. He always felt that it wasn't him, it was the Institute. It was the entire group pulling together that produced everything. So for that reason, he threw the party and had the Lasker Award thing up above and told us a little bit about it. He, of course, published papers. He published books that all backed it up, what he was doing with it.

AK: Had you been involved with some of the work that led to that award of that?

DP: Not directly.

AK: You know, I asked earlier about his lack of interest in formal academic appointments because he could just see what was coming, you know, with committees and all of that.

DP: Oh, yes.

AK: But that doesn't mean that he wasn't a teacher and wasn't doing teaching.

DP: No, not at all. [laughs]

AK: Tell me a bit about his teaching at Woods Hole. Was it all informal? Did he give some lectures?

DP: He gave lectures, for sure, and there was another—in fact, it takes you to make me realize that we had, during the nine months of the winter, we had tea from four to four thirty and, of course, you kind of look at it as, well, that's a way to relax and the group to get together. But ideas were kicked back and forth and his attitude was, there is no such thing as a bad idea. No matter how ridiculous, no matter how stupid, it will lead to something because why did you think of it to begin with, and it will build into something.

The other philosophy, or the philosophy that went along with it was that with that kind of sine wave that you had to the research that you do, whenever you feel like you're kind of up a brick wall, you're not getting any place, what has happened is that you're in a big forest and you have your nose against one of the big trees and all you can see is the bark on this tree. You must realize that at that time, it is time to stop what you're doing, back out of the forest completely, get clear out and take an overall view of everything you've been doing, everything you've been doing, everything you've been trying to do and spend time going over that, not trying to figure out the next step that you're going to do in research, but to get the big

picture because the big picture then will start making some things worthwhile, make some things really small. You'll get the proper perspective on each channel that you could go forward with. So this is how you should channel your efforts for what you're going to do.

AK: And he was teaching then not just about the subject matter of the biochemistry project, he was teaching something about the creative process.

DP: The creative process. The method for doing your work.

AK: He has been quoted in many places as saying that science was sort—doing science was like play.

DP: And I think he made it that way for us, that what we were doing wasn't work. I know when I got up in the morning, I—the first thing I thought about was getting in there and having fun working in the lab.

AK: And at the same time, even though it was creative and it was fun and it was supposed to be fun, there was an extraordinary, even a demanding commitment to an ideal of science, a full commitment to your work.

DP: Oh, yes, certainly—he was fully committed.

AK: How he do that with a group of people? On the one hand, to communicate that this is fun and we're going to have a good time here and there's not a lot of high pressure. At the same time, this is a calling, this isn't just a job.

DP: Yes, yes. Because he was leading the way. He wasn't dragging you along, and you felt that you were in a wonderful group that was, in a sense, so committed that you couldn't miss going for a coffee break or the tea because if you got to working on something and you had an idea, and you were going to go roaring forward with it, you would discuss it with the people you were with. You never had to worry that your idea was going to be stolen by somebody else in the group because everybody was handing ideas to everybody. Everybody had so many ideas, there's no way in the world they would ever care to even do it. Remember, where I came from, it was a different world. I went from black to white.

I can remember, this is a specific instance. Somebody published that radiating hydra improved their lifespan, and so I was thinking, geez, I wonder if ultra structurally there would be any change in the radiation. Hydra would be easy to fix and easy to look at with an electron microscope. So on a coffee break, I mentioned that to one of them and that person says, "Oh, I know the answer. You don't have to waste your time with that. The radiation killed the bacteria that were shortening their life." And it's like [snap], a year saved. It was so many times that one conversation in that group would save you a whole year of work, or put you off on another trail because you'd be talking about what to do.

AK: On the subject of this kind of creative chemistry that Szent-Györgyi was able to do so well in his laboratory and with the people who he attracted to work for him and who he picked to be part of a research family.

DP: Sure.

AK: You had mentioned before we actually started the taping, that he had a bit of a reluctance maybe to hire Americans. You were . . .

DP: The first one.

AK: The first one.

DP: Yes, I was the first American and he was looking for an electron microscopist because EM [electron microscopy] looked like it was going to play a part in muscle structure research, and it just turned out that I was somebody that would fit the bill for that. Then after working for him in the summer there, I kind of found out peripherally that then he changed his mind when it came to, can Americans work as hard as Hungarians?

AK: He changed his mind about Americans not working as hard?

DP: Right.

AK: Uh-huh.

DP: Right, right, and Dick Steele was then hired and Dick was a marvelous person, too, worked out extremely well. Prof made sure that he had his lab right beside my lab because I was by myself. In the winter, it was only the Institute there for quite some time, and so he put him beside me, so we sort of had friendly relations and sight of each other.

AK: He put Dick Steele beside you?

DP: Yes.

AK: Yes. Most of the people around him, then, were people he had brought or he had helped to come from, mostly Hungary?

DP: Uh-hmm.

AK: To the United States.

DP: Right. Yes, and when the Hungarian Revolution took place . . .

AK: In '56, yes.

DP: He picked up a couple people. In fact, that's where he picked up two ladies to come out. I believe that was after Profne had died, and the deal was one was to be a housekeeper for a year, the other one he would fund to go to college for a year and then they would switch.

AK: These were the Felker sisters, I think.

DP: Well, he married one of them, but it ended up that the one that was to help, ended up being his wife.

AK: You mean Marcia?

DP: Is that her name?

AK: Well, Marcia Houston was his wife at the very end of his life.

DP: Yes, that's it. That's the one I'm talking about.

AK: She was an art student at Washington University in St. Louis.

DP: Was that it?

AK: Yeah.

DP: Another Hungarian he got, she had the tattoo on her arm.

AK: From the concentration camps?

DP: Yeah, Nazis.

AK: But in spite of his concerns that maybe Americans wouldn't quite fit in, it didn't work out that way.

DP: Oh, no.

AK: You mentioned Andrew was like a brother to you.

DP: Oh, yeah, like the brother I never had. He was marvelous, just marvelous. In fact, this would be nice to put on tape. I had never, ever heard Andrew say a bad word about anybody, and I mentioned it to somebody that was sitting in my lab and they said, "I never heard him either," and then we got to thinking, "Gee, is there any way we could trap him into saying something bad about somebody?" Well, there was one guy who was, if I used Prof's term, a skunk because he used that a couple of times when people pulled stuff on me. And we got Csuli into the conversation, you know, and popped the question and Csuli thought for

a minute and says, "Well, he doesn't have a good sense of humor," and that was it. [laughs] Oh, touché! One more for Csuli.

AK: That was the worst he could say.

DP: The worst he could say.

AK: Speaking of sense of humor, could you tell me again the April Fool's trick that you all tried to play on him?

DP: Oh, yes, yes. This was marvelous because of the way it worked out. I called New York to a friend, 270 miles away, which is also where Stephen Ráth, the secretary of the Institute, was kept, because Prof didn't want extra paperwork here, and I asked him to send a telegram to arrive on the morning of April 1st, sent to Szent-Györgyi . So they sent it, and it said, "Please disregard first telegram, signed AF," and Szent-Györgyi said to the Western Union person, "But I didn't get a first telegram," and they said, "Well, that's very common. Lot's of times people send one, then suddenly they realize that they really shouldn't have sent it, and so they immediately send one that says 'please disregard first telegram.' So they keep it under the ten words, get the telegram off and that takes care of it." "But I didn't get a first telegram," he said. "Well, we know, but it's very common that one gets ahead of the other one, so we'll call you the minute it comes in. Don't worry, just relax." "Okay," so he hangs up.

Half hour, a little bit later he calls back and says, "I still haven't got the first telegram." They say, "Oh, Dr. Szent-Györgyi , relax. We know you. We know you real well. We're really looking for it. Anything that comes in, the first thing we look for is your telegram. We'll call you." "Okay." So he hangs up and this goes on for most of the morning and finally, instead of just agreeing and not thinking about it, Szent-Györgyi starts pacing back and forth and putting his brilliant mind to work. So he starts trying to figure out who this person is. So he's going back and forth and repeating it fairly loud, so you can hear it, you know, "Please disregard first telegram. Signed AF. Please disregard first telegram, Signed AF. AF. AF. April Fool. Oh, dammit!" And Profne confided in me . . .

AK: Profne being Marta, his [second] wife.

DP: His wife, who was just an absolute charm and just like, you know, one of the family. She confided in me that for the first month he would tell that with a bit of indignation to other people, and they would die laughing. Then he realized that instead of getting sympathy, he had one of the best stories he could tell anybody. So then he couldn't wait to tell it to people and laugh right along with them.

AK: Uh-huh. You mentioned wives. Now, I don't want to call it a rule, but he had maybe a policy about wives who were working in the lab.

DP: Yes, because it was good, I suppose, that if they had talent to put the talent to work and not have them just sitting at home.

AK: Andrew's wife, Eva, for example.

DP: Andrew's wife, Eva, and Prof's wife, who was called Profne. The reason for "Prof" was that Prof said, "You cannot pronounce Szent-Györgyi properly. When you use my name, you won't be saying it properly. So that's not good," and he says, "I don't want to be trying to correct it and I don't want you to be saying Professor, because I don't like that term, but Prof will do just fine. So I want everyone to call me Prof, and in Hungarian, if you put a n-e at the end, it makes it feminine. So my wife is Profne and I'm Prof." So this is what they became, Prof and Profne to us.

AK: Did that happen after you got there? Did he decide upon this way of . . .

DP: I don't know.

AK: Because it wouldn't have a problem for Hungarians to pronounce the name.

DP: Oh, no, for the Hungarians, because for example, when I was first there and the only American, and they would have parties, the parties were all in Hungarian. I couldn't understand a word of it and they would be laughing and having a good time and somebody

would get up and pantomime different people and Prof, the way he paced, used to stick his thumbs in his pockets and wave his fingers back and forth. He had certain characteristics that were pretty easily recognizable and they would go through pantomimes and stuff like that. So that was good. Well, I decided that if I was going to be the only American, I'd better learn Hungarian, so I got a book on Hungarian and started trying to work on it, but then they hired Dick Steele and now with two Americans, they had to switch to English and so now the parties were in English.

AK: Of course, he spoke English . . .

DP: Oh yeah, they all spoke English real well, it's just that when they got together, even their friends were Hungarian and so it was easier to do it in Hungarian. Never gave it a thought.

AK: But I suppose when more and more non-Hungarian speaking people came, he then had to decide what people were going to call him.

DP: Yes. I'm . . .

AK: I'm Prof and this is Profne.

DP: Because I can remember him explaining to me that I wouldn't be able to pronounce his name.

AK: So tell me again about the wives policy.

DP: Well, the reason for hiring the wives and having them have the proper job, he said that they should never have the wife work for the husband, but have the wife work for somebody else and so he had his wife work for Csuli Szent-Györgyi and Csuli Szent-Györgyi 's wife worked for him. So that this he felt was the proper mental and political switch, so that people would not criticize, or if any little things happened it could be blown into mountains out of molehills. It worked out really very well. When I came to NASA, the Director of Life Sciences had a wife who got cancer and was operated on successfully, but was told "You've got to occupy your mind. Go back to school and get your Master's Degree, and why not get it in electron microscopy because you'll have access to that?"

So she came down, wanted to know if she could do it, and I said, "Wonderful." Taught her electron microscopy and she was so good at it that I said, "From my experience in Woods Hole, I think it would be great if you came here and you worked on projects for the director, who's having some electron microscopy done, because then at night, when you're having supper, you can discuss what you want to get done. It will be much more productive," and I said.

But the way to do it, knowing from what I had learned in Woods Hole, was that she should not work for her husband. She should work for me, and that she should observe the rules that Szent-Györgyi had set up for the wives and that was that they were to be treated exactly the same as anybody else in the lab, so that everybody in the lab would know that they're not

getting special treatment and to be told that if you make a mistake, you will get yelled at exactly the same as anybody else, and the director's wife told me, "Yes, thank you. That's exactly what I want. You now made me feel welcome."

AK: A wise policy.

DP: Yes, it was. It was amazing the amount of spin offs and things that I got from working for him.

AK: Now, as you and I are sitting here at your table in Sunnyvale, to my right is a . . .

DP: Microtome.

AK: Piece of technology there, a microtome. Could you tell me about that and how that fits into your work at Woods Hole?

DP: This is an integral part of Prof and Del Philpott. When I went to the institute, I immediately showed Prof some drawings I had and I said that I had worked on the development of an ultra microtome and worked out all of the parameters that needed to be done to build one, and this is my drawing. But I said, "They did not allow me to build it in the last place and we have to have an ultra microtome in order to do the work that we're doing." I was prepared for a half hour talk on it but, with his great brain, he didn't need anything except the proper reason.

He said, "Okay, I got a machinist in Connecticut. Build it," and he built it for four hundred dollars, which was great, and when he called me up and told me he had it done, I grabbed an airplane, because I had a commercial license. I could get an airplane pretty easy and rent it, fly it. Flew to Connecticut to get it, because I was so anxious to get it and get it back, and then the guy kept saying, "Well, this is how it works. This is"—and I said, "I designed it. I know how it works." "No, no, no, no, I can't let it go. I'm so proud of this. I got to tell you. I got to tell you."

Finally, to shut him up I offered him a ride in the airplane. He took that. We put it in the back of the airplane and I gave him a ride, came back and dumped him off. Flew back, got back, at about, oh, twelve o'clock, a little after, and the Hungarians always ate lunch late, so by the time I got back and could set it up, they had gone to lunch. I remember thinking to myself, "Thank God, because if doesn't work, I'll have time to think of some excuses." Well, I turned it on and it worked. Then I was mad! Why were they at lunch? Why couldn't they come here? Why couldn't I show it to them?

Well, then the next thing I found out, and here's where Prof really put his brilliant brain together again. I found out that since my lab faced south and it was a thermal advance microtome, that when the sun came in and shone on the microtome, it would start moving it and it would start cutting, and if I didn't pull the shade down part way, it would not only not cut thin, but then it would start cutting thicker and thicker and thicker. So I said to myself,

"Hey! I can use the window shade to run my microtome." So I took a piece of paper, marked it off in angstroms and then put it up beside of it, watched the colors and stuff for the amount of sunlight that was coming on it, and I calibrated my microtome with the window shade.

Then Prof came in and said, "Well, how are things going?" I said, "Have I got something to show you. Watch this. Look through the binocs and I'll call off the colors that you see as the sunlight is shining on that microtome." He looked at it. He looked up and he says, "Perfect, when I was in Budapest, a prince was where we got our money to do our research. Now, we had to cobble everything together, and in order to do that, we had a lot of pieces hung up to the next one, to the next one, to the next one, and so there was a lot of things that had to be exactly right on each little piece or it would burn out. Well, since there was so many things to remember, we had a wire recorder—didn't have tape recorders then—and the requirement to be an officer in the Hungarian Army is to be able to swear for twenty minutes without repeating yourself, and then you can be an officer in the Hungarian Army."

And he said, "We got somebody who could swear for twenty minutes and put him on the wire recorder. That was hitched up to it, so if it was not turned on properly, the wire recorder would come on and start swearing away at you, and keep swearing until you got it correct. Well, word went out that we had this thing working that way. The next time the prince came, he walked in and instead of wanting to look at a test tube that had a precipitate and an explanation and everything else, we said, 'What can we show you?' and he says, 'Turn the

equipment on incorrectly, I want to hear the wire recorder.'" So he said, "We turned it on incorrectly, it started swearing away like mad, and we kind of cringed and he's there with a big smile and finally he says, 'Okay, you can turn it off.' We turned it of, he says, 'You boys know exactly what you're doing. You got your money,' and walked off."

So he says, "That window shade is the same as that wire recorder. From now on when a site visit man comes, I'm calling you on the phone. I'm going to find out what time the sun comes in. That's when I will bring him by your lab. You'll be all set and we'll cut sections with a window shade," and sure enough, the next site visit guy that came, came in. I had it all set and I said, "Here, I want to show you how we run our ultra microtome."

So I start running the window shade up and saying, "Okay, is it cutting?" "Yeah, it's cutting." "Gee, gee. Hey, let me run the window shade." [laughs] So that's what we were doing, we were working it with the window shade. We got through. It was the first time I ever had a site visit they didn't want to know anything about the science I was doing. "Boy, that's great. You really know what you're doing," and off they went. So from then on, we cut sections with the window shade and it was beautiful. We got our money.

AK: Now, that was a serendipitous finding.

DP: Oh, yeah.

AK: How would you have cut them, without the sun?

DP: Oh, it's a thermal advance. See where the two wires are there?

AK: Yes.

DP: I had a Variac and the Variac just fed current from a 110 plug.

AK: But the shade worked better?

DP: Well, it worked the same. It wouldn't work better, but it worked the same as with the Variac. Then obviously you couldn't wait for the sun to do your sectioning. A lot of times you didn't have the sun.

AK: But it was kind of neat.

DP: Of course you had to have the other, but I don't think after the word went around on that, I don't think anybody ever came to the lab that didn't want to play with the window shade there. I had that big strip, you know, angstroms, running up. [laughs] It still works.

AK: It's an example of the kind of creative thinking, looking at things—what did Szent-Györgyi always say, discovery is seeing what everybody else sees, but thinking what nobody else has thought.

DP: That's right. When I left, he said, "You've got to take that microtome with you." He says, "We've had so much fun with it. They'll just throw it out here. You've got to take it with you."

AK: This was an invention of yours.

DP: Yeah.

AK: What year was that, did you do that?

DP: When I first went there. That was almost the very first thing I did because we had to have that. When I worked out the principles for doing ultra thin sectioning, I realized that I could take a Spencer 820 microtome—you're probably familiar with one of those. It's a very heavy piece of equipment for cutting light microscope sections in paraffin. The thing just goes up and down, and that's it and it rubs when it comes up, obviously, but it doesn't matter. It's cutting them so thick, it makes no difference. But with that, you don't dare go by and put an electric charge on it, and maybe rough the surface up a little bit. You've gotta miss, and so I reasoned that I would not have to modify the Spencer 820 microtome at all. All I

needed was a tongue depressor with a notch cut in it, and what I did was I put the plastic block that we wanted it in—and you had to have a really highly polished knife. You had to have a good edge.

That was another problem. You had a really good edge, and then run it up and down until it cut, and then until it wouldn't cut anymore because it was just up and down. Then I'd push a little bit with the tongue depressor, push a little bit with the tongue depressor so that it cut enough so that it's now going to miss when it comes up. Now, all you have to do is get just the amount of pressure on it, and you can cut an ultra thin section. I actually published it. I've forgotten where it went. Nobody wanted to do it that way.

AK: But it worked.

DP: But it worked. That's how I got my first ultra thin sections, with a tongue depressor and I remember showing it to somebody and they said, "You should publish that."

AK: Now, we've talked a lot about the pleasure, the sense of humor, the sense of joy and discovery. Did you ever see Szent-Györgyi frustrated in his work? Upset?

DP: I don't think I ever did. Of course, I wasn't up there, like Jane [McLaughlin] was with him all the time, but it seemed like he always had some idea he was trying, and he worked on books, published some books. I remember one of at least, and there was another book that

was published where somebody had a drawing of the MBL and they had Prof and just a pen like drawing, you know, where his Institute was. Then they had Del and pointed at the spot in MBL where I was. But I don't remember him ever being that way.

One time, Prof was going to give a Friday night lecture at the MBL. I think he gave at least one every summer and some people came by my lab and they said, "Boy, we were really laying for him. We've looked over all his work and his theory of muscle contraction, we've got some good holes in it and boy we're really going to clobber him tonight." They were bragging to me, knowing I guess that I work for him and I better be there so I could seen him get his comeuppance.

So I went to Szent-Györgyi and said, "Hey, so and so has been in the lab and they're bragging about that and I thought you ought to know about it." He said, "Oh, okay." He seemed nonplussed about it, so I thought, "Well, I guess it was okay to tell him." What he did was come up with a completely new theory of muscle contraction. He did not talk about what they expected at all, and they sat there and never said a word because what they had the ammunition for wasn't any good. I walked away saying, "Geez, no wonder the guy got a Nobel Prize. He's brilliant."

AK: Uh-huh. There must have been a real change then between summer and—what would you call it? The off season? The winter? Was there a name for that period, the nine months of the year?

DP: Well, of course, he worked in his lab year round.

AK: Year round, right.

DP: So there was no change for him, and then for me, of course, I went immediately to the people who were coming in. I had to schedule them, figure out what they were doing, how best we could approach what they were doing, what we could look for, how we could fix things, how we could cut things and do things like that. So by the time summer was over, I was pretty close to an emaciated wreck, and I took my vacation then and then came back ready to dive in and get the work done.

I got pretty well known for stuff I was doing. I was starting to get offers to give lectures at different places. One time I guess I'd had several in a row and I went up to Prof again and told him I had an offer, and I could tell he was a little upset I was going to be gone so much, and I thought, "Oh-oh, I better be a little bit careful how many of these I accept." So then I kind of paced myself, you know, how many times I went off and gave lectures.

AK: Well, now, you mentioned earlier in our interview about his support for your Ph.D. work at Boston University.

DP: Yeah.

AK: And that he really wanted to make sure that you could do that.

DP: When I first went with him, I told him I didn't have a Ph.D. and I wanted to be sure that I wasn't there under false pretenses.

AK: Right.

DP: And he said, "If it works out between us, I'll help you get it." See, and then ten years later—well, I had I think 48 or 49 publications and when I realized the number I had, I thought, "Gee, if I quickly write one more and send it in, then when I have my application, I can put down 50," because when I was a student before, one student had one publication and the teacher kept bringing it up all the time and it kind of bothered me after a while. If they want to bring mine up, they can bring up fifty this next time around. Anyway, when ten years had gone by and we'd had a wonderful time, like I say, I don't have to worry about where I go when I die, because I had my heaven on earth for ten years, and that's as much as anybody can expect.

He came in my lab and says, "Well, I'm only one person and I only have a small institute, working mostly on cancer now. You're a lot younger. You have a future ahead of you and the Ph.D. doesn't mean a thing to me. It never has, and we both know it didn't, but out in the cold world it will." So he says, "I think this is the right time for you to get your Ph.D."

AK: He approached you?

DP: Uh-hmm.

AK: Did he know that you might want to do it, or did he just come up with it?

DP: He only knew that I didn't have it and that I had told him . . .

AK: When you first started.

DP: When I first started, but he also knew the cold world and knew what I would face without it. The limitations on advancement and the impossibility of ever having a lab group and directing it myself without it.

AK: So he actually helped initiate your . . .

DP: Oh, yes, yes. He told me that I should do it.

AK: Okay.

DP: And he was absolutely right.

AK: Yeah. Then you did it.

DP: Oh, yeah.

AK: You got your Ph.D. in '63.

DP: Oh, yeah. Well, I of course announced that I was looking for a place to go and because in the ten years I had been there, I had never used German–even though I was pretty fluent in German–or French once in my scientific work, I felt that the requirement to have those two languages was the dumbest thing that anybody could ever make a guy waste his time for. So to go back after ten years is going to be harder, and I didn't want to go back to a school where the Language Department gave the exam because then I would have to kill myself learning the languages, and maybe after ten years they wouldn't even allow credit for my German that I had passed at the University of Indiana.

AK: Some people might forget now, because requirements have changed, that up until fairly recently, you needed to be scientifically proficient in two or three different languages to get a doctorate.

DP: Pretty stupid. They have all the international meetings and stuff in English. It was crazy. I had oodles of offers pouring in, wanting me to come and do electron microscopy and set up an electron microscopy lab for the universities, but the Language Department would give the

exams, and I didn't want to kill myself doing that. One of them called up and said, "Well, we can cut it to one for you and then we'll have a math exam for you to take. Would that be okay?" [laughs]

I got all kinds of offers like that, but Boston University, the department itself gave the exam, so now you knew you didn't have to kill yourself, and they agreed that the summer before I went up there, because I still ran the electron mic that summer in Woods Hole, that I could take the German exam in the summer, so I wouldn't even have that one to worry about. Once I started, I'd only have the French, and that was an easy French thing. It wasn't much, and they flunked me the first time just so it looked good on paper, I guess. I didn't do as well the second as the first, and got passed. But anyway, that took care of that.

Then there was one more twist to it. The assistant chairman of biology was supposed to take over the electron mic lab—see, I put in for a grant, got the biggest grant they'd ever had, eighty thousand, bought a German electron microscope, got Jack Kennedy, who later became President, to take the eight thousand dollars tax off the microscope because it was for a school in Massachusetts, which he was representing at the time. Bought a second used RCA and set them up with a nice teaching set up that they could have, but the assistant chairman who was supposed to take over never came up once to see how the thing was run and who was supposed to run it.

So later I found out that for my Ph.D. orals, when I told them that so and so was on my Ph.D. orals, and that I knew the guy and that I thought it would be fun to have him as one of the people, he had planned to flunk me, so I'd have to stay another year and take care of it for him. Since that guy was a friend, he wouldn't be able to get him to flunk me, so he ran and he got Metalsky, who I never heard of, and put him on with only a couple days to go. So I ran like mad to Metalsky, carried my thesis over and said, "I'm sorry that they put you on so late, but here it is. I hope you have time to look at it because I'd really like to have you understand what I've tried to do here for my Ph.D. thesis," and he says, "Oh," he says, "in a couple days I'll call you doctor." So that made me feel a little better.

Well, I passed because it took two to flunk me. Pat voted against me, but it was only one, so that didn't flunk me. I immediately went down to Woods Hole to tell Prof that I had passed, and I walked in and he had a smile on his face and before I could open my mouth, he says, "Well, I hear you passed." "You hear I passed? How did you hear?" He said, "Metalsky called me up." "Metalsky?" "Yes, he was a student of mine in Budapest."

AK: You had not known that?

DP: I did not know it. [laughing] It was like taking off a friend and putting an uncle on my board.

AK: Wow.

DP: So that was sort of a last little sweet touch, you know, that went into it.

AK: Very nice.

DP: It was great.

AK: He never told you that until you passed.

DP: The minute that Metalsky had been put on the oral exam committee. He called Prof and says, "I'm on your man's Ph.D. thesis," and so Prof knew he was already on it.

AK: He knew he was on it, but he didn't tell you that . . .

DP: Well, I wasn't back in Woods Hole.

AK: Yeah, you weren't there.

DP: I was up at BU sweating it out. It came back. Isn't that a neat little touch?

AK: My goodness. Quite a story.

DP: That's great.

AK: You know, I imagine that on the one hand, it was part of his honesty, part of his charm, part of his idealism, part of the white, when you talk about white versus black, part of the white part of the goodness of Szent-Györgyi that he had this kind of 'money's not as important as other things.' On the other hand, in a way, it also gave him some trouble, that he didn't seem to understand the fund granting, or he did understand the fund granting process, and just didn't want to play.

DP: He hated it.

AK: He hated it.

DP: Yes—two things. One, the insurance company published that they would give ten thousand dollars to several people to do research and one of the conversations we would often have is that how the hell can we write proposals saying what we're going to discover, when we don't know what we're going to discover? How can we do it? He said, "Almost everybody who has to do research, finds something but doesn't say it. Write the proposal that that's what they're going to discover and have this lag time built in, in order to keep going with their granting stuff." So he says, "I've seen this ad for ten thousand dollars and I have written them a letter saying 'I offer you my services to spend ten thousand dollars of your money on biochemical research,' signed Dr. Albert Szent-Györgyi , Nobel Prize Winner, and I mailed it to them. I did not tell them what I was going to do, and I think I'll get a letter from them." This was at tea.

A week later he comes in and whenever he wanted the floor, he always did this, he put a finger up and we were all quiet to listen. "I heard from them." "Yes?" He said, "They called up and said, 'We got your letter, but we don't understand it.'" So he says, "I went ahead and I explained it to them. When a baby is born, it can be a Hitler or an Einstein, there's no way of knowing, and that is what people ask you to say when you write a grant, is it going to be a Hitler or an Einstein, and there's no way you can say it." So he said, "I went ahead and I explained the whole thing to them and they said, 'Hmmm, okay, you got your ten thousand.'" [laughs]

Now, let me tell you something else that I think is a real key to Prof. I asked him about his discovering vitamin C because, gee, here's this one chance in ten billion other people that can ask him. He says, "Oh," he says, "that's really interesting." He said, "I had isolated only enough ascorbic acid to be pretty sure of what I had, but I had to have some more and I was trying and trying to find stuff that would have enough in it. I came home for supper and my wife had cooked peppers. I hate peppers, and I didn't want to eat them. Hmmm, how can I get out of this?" So he said, "You know, I haven't tried peppers yet. Ya, I got to try these."

So he said, "I quickly grabbed up everything, and then I said to my wife, 'Well, did you cook anymore?' because I figured if she had some waiting, she'd bring a second bowl," and she said, "Well, yes, I did." So he said, "Oh, oh, we got to put these in the pot, too." So he put them in there and then his brilliant mind worked and said, maybe there's some raw ones in the refrigerator, see. So he said, "Do you have any more in the refrigerator?" She said, "Well,

yes I do." "Oh, I'll take those," so he had everything she had. Now, his plan he said was to go to the lab, throw them out and just go ahead with his work, but here's the key to Prof. When he got there and thought about throwing it out, he's so honest, that he said to himself, "You know, I can't go home tonight and tell her I threw it out. If she asks me, I have to be honest and I have to tell her. I can't tell her that. I'll have to run it," and he says he ran it, and there it was, "I had my vitamin C."

AK: That's a great story.

DP: And that I think illustrates Prof a lot, about how honest he is. The only troubles I ever saw him get into was because he was totally honest.

AK: Now, as he was encouraging you to get your Ph.D., I almost have the idea that he's thinking ahead for you.

DP: Uh-hmm. Because he said, "It's only a small institute. You're a lot younger than I am."

AK: So he was expecting that you were going to leave, or anticipating that you would leave, or maybe that he would not outlast you.

DP: Well, there's two things he was expecting. Everybody expects to live forever, but he's a lot older. He's off on cancer, so his directions have changed some. He doesn't need electron microscopy as much.

AK: I see.

DP: And the life of the Institute is not going to be the life of my professional career. So all these were factors in his mind.

AK: Tell me a bit, then, about your decision to leave. You did go to the University of Colorado Medical School, was it?

DP: Yeah. The decision had a couple steps in it. I felt that the electron microscope, the ultra centrifuge that had just been put in, both needed to be running through the nine months in the winter in order to be runable when summer came. They would be a basket case by the time summer came, sitting in Woods Hole and all that moisture and all that stuff and not run. And then there was the need to have professional operators on both of them. They should hire somebody for the ultra centrifuge, and they should have somebody for the electron microscope. Unfortunately, a lot of the old diehards that had come there every summer through their career at their universities, had their pet lab they came to for three months.

So they allowed the MBL to be shut down for nine months, this big operation dead for nine months until Prof came and this area around just him for quite a while. So I said that this really should be done, since everything was working great and so on. That what I should do is get a grant, and with the grant, I could work on my grant the nine months in the winter, and I could run it for them in the summer. Now, the Director of the MBL at the time, the one that I had to take the tie off for, I've got to get him back into this thing. I got a hold of one of the granting agencies, somebody I knew. You get to know pretty well all around, NSF I believe it was, and told them what I wanted to do and so on. They said, "Oh, fine."

They were all for it, so it looked like it was going to be an approved grant. Wrote it, gave it to MBL to type and the Director said, "Well, you didn't put in rent," and I said, "The granting agency doesn't allow rent." I don't know if they do now or not, but they didn't then. And I said, "They won't approve it if you put rent in it," and he said, "I'll rewrite it so they can't tell it's in there." I said, "Well, I don't think they'll be that stupid. You know, I think they'll be able to figure it out, no matter how you rewrite it and put the stuff in the budget with it." "No, no, that's the only way it's going to be done." So he did and they rejected it, so I couldn't get my grant and I had to leave. So that's why I left Woods Hole. Now, I've never been real sure—I think that the rule was correct, and that it had to be done, but I'm not dead sure. There's always little devil with a pitchfork inside of you saying that the Director got even with me.

AK: For having to admit you to the reception without a tie.

DP: Well, to have to accept me. I hope I'm wrong. That part of me is not a Szent-Györgyi , I guess.

AK: So you . . .

DP: But they fired the Director shortly after that, and like I say, sometimes there's moments that are kind of nice. He met me on the bridge by Captain Kidd's after he was fired, cried on my shoulder about why he got fired, and I thought, "I'm enjoying this moment." [laughs]

AK: But you then needed to go find . . .

DP: Yeah. See, so then I looked around and I could have gone with Csuli and Shinya Inoue up to Dartmouth. They wanted me to come up there and be with them, and I said, "Well, geez, I really think I should be out on my own." It was a terrible decision, whether to go up with them or on my own. I got the offer to go to the Department of Biochemistry in Denver, Colorado, so I went there, which turned out to be the wrong thing to do. And I had lots of offers that would have been pretty good.

One of them was in Canada—I'll say Quebec, I'm not sure. Maybe Montreal. Can't remember now. The Histology chairman was interviewing me and there was a book laying on his desk, and while he was interviewing me and talking to me about the position, he asked me about electro microscopy and I said, "Well, do you want to see a photograph of mine?

Look at the cover of your book." He looked at it, paged in there, "photographed by" me. Picked up the lab manual, picture on the cover by me. [laughs] He turned to me and said, "Well, hmm, I suppose if you want the job."

AK: Tell me about leaving Woods Hole. You had been there a long time.

DP: Well, ten and then the three, so thirteen years. Well, I left by myself. I had been married all the while, but let's say that there was an—of course, you go to school, you don't spend as much time with your wife or there at Woods Hole with her. And an Air Force navigator turned out to be a better navigator than just navigating an airplane. Without going into details, that was the end of the marriage. I had the airplane and so I figured, well, it would be tough for her for a while and I hadn't paid an awful lot for the house. I gave her the house and the car. I sold my airplane and bought a car and went to Colorado.

AK: You said goodbye, of course, to Szent-Györgyi .

DP: Oh, yeah.

AK: Tell me about that. He was generally supportive of your leaving?

DP: Oh, yeah. He was very supportive of that, because like I say, he had gone into cancer work. Rather than really working with him, I worked with Csuli, see, and then Csuli left. So a lot of the people in the Institute had left and he was pretty much down to just his lab.

AK: Tell me about your contacts with Szent-Györgyi and Woods Hole after you left, because you maintained a relationship with him.

DP: Oh, I can tell you one really good one. When I came to [NASA] Ames Research Center, they had a package like this and were kind of running from office to office. They said, "Well, I'm busy. Why don't you just take the package and go to the next building and take it to room such and such," and I thought "Well, there's no reason why I can't take a look." I took a look. There was a blank piece of paper on the top of everything and it said, "This man was unconditionally recommended by a Nobel Prize winner."

AK: Wow.

DP: I said, "The rest of that's junk." [laughs]

AK: Somebody had written that on there?

DP: Yeah.

AK: That's quite a compliment.

DP: I thought so, too.

AK: And a nice thing for him to do.

DP: Oh, yeah. We always had a rapport that was excellent, and I remember telling Csuli one time, I said, "Geez, Csuli," I says, "it's so hard for me when I interact with Prof to realize he's the boss. He's like an uncle." I said, "It's really hard." He says, "Yes, but please always remember it." So I always tried to, so I wouldn't be smarting off or anything like that.

AK: Now, did you go back to Woods Hole from time to time?

DP: Well, the arrangement in Denver, and I made this as part of an arrangement any place I was going to go, that I could go back in the summer. I had so many friends that I had published and worked with that having a little space in a lab was slam-dunk, you know. There was nothing to that. So the first year in the Department of Biochemistry I made all the arrangements for going back. I was all set. I think I was like two weeks from it or something for leaving for the summer and the chairman told me I couldn't go. He wouldn't let me go.

I was back in the black world. When I got there, I'd been told that I would be paid for my moving and when I got there, he said, "Well, you really can't do that, but if you tear the stamps off of everything you sent me, I'll reimburse you for the stamps." Now that was my clue that I'd made a mistake. Then everybody else that came—I remember another person came in that he hired and was actually crying in my office and he'd only been there two weeks, because of the way he got treated after he got there. I said, "Have you burned all your bridges?" and he says, "Well, maybe not." I said, "You got a bridge you can get on, get on it. Get the hell out of here."

AK: But you did maintain touch, though, with Szent-Györgyi ? You did go back to Woods Hole from time to time?

DP: Well, I would go back and visit him.

AK: But you didn't spend any extended research periods?

DP: No, none. I was onto doing different things.

AK: You mentioned some photos that you had taken around his 90th birthday.

DP: Oh, yeah. See, he had an 80th and a 90th, and like I say, I was really flattered to find out that on the first list of five, I was on there for being invited.

AK: And also to take the pictures.

DP: Oh, yeah, and to bring a camera. He would buy me or give me enough money for some flashbulbs and a couple rolls of film before each party, and what I did—see, we'd have the party on Saturday night and on Sunday I would go in and develop the film. Then on Monday morning, I'd come in early and I'd print and I would print everything up on 8 X 10's, because I knew we'd have tea at four to four-thirty and that's the ideal time because that's what you're going to talk about, the party, see? So I would come up, pass the pictures out. Then people could all go around and look at the pictures, and then they were for Prof to take home with him.

AK: How did you hear of his death?

DP: Gosh, he had kidney failure and they offered to put him on dialysis, and as it was explained to me—it was somebody from Woods Hole that called. You know, mentally I was more on him and what had happened than who was calling, but he refused with the statement that it would only prolong things and that it in the long run it wouldn't be worth it. Like I say, his mind went for the most correct—not the only, but the most correct—answer that one could come up with. I was always amazed at how fast he would do it.

AK: Yes.

DP: One time there was a local city problem and they were going to have a town meeting, and the town physician was there. He worked on schistosomiasis and I took pictures for him. The physician turned to Prof and says, "What do you think we should do?" and Prof immediately said, "You have to make a big noise right away, or forget it," and that was it in a nutshell. You stand up and fight for it, but you don't sit around and whimper about it. That's another sort of clue to how he thought.

AK: I would like it if you could take a look now at some of the points that you had prepared and to see if we have covered everything.

DP: We should have covered a lot.

AK: Because I want to make sure that we get to the things that you wanted to mention.

DP: Okay. New Year's celebrations I don't think we covered.

AK: We didn't.

DP: New Year's for the Hungarians was very important, and the one thing they did that was different than any place I've ever been in, they had a tub of water and they melted lead in a crucible for holding lead, and they cast the lead into the water. Of course, it has a period of going through some air and then into the water and then hardening. When it hardened, they

had somebody that was pretty good at making up fortunes, and they would get this out and have the light either cast a shadow or find the right angle to look at it, and then they would tell your fortune for the coming year.

AK: Oh, that's nice.

DP: That was really neat in the way that we did it. Oh, here's something we didn't do. A site visit was in progress up on the third floor, where you could look out on the ocean, and because of the beautiful view the site visit—I don't know if it was one or two people—were looking out. When they looked back, Prof and Csuli were gone. I mean, just like that, they weren't there. So they walked around, "Where did they go? Where did they go?" They came back to the window and looked out the window and Prof and Csuli were fishing. They were actually fishing out in front. He said, "Geez, I don't believe this." Pretty quick they're back in with their poles, put their poles away and Prof says, "You'll have to forgive me. You'll have to forgive me, but," he says, "Csuli came in and said the Blues were running. Bluefish. He says, "They're running," and he says, "you know, they go right through. If I would have explained to you that I wanted to go out and fish for it, they'd have been gone. So I'm sure that you understand that we had to run out and take advantage of it, and now we're back." [laughs] The guy says, "You're right. I would have done it, too." [laughs] But again, you get a little clue to how he did things.

Oh, here's something else. When we had our parties, he believed if you played games, it meant a lot more if you bet money, but it was wrong to bet large sums of money and it didn't matter how much money you bet. If you had money involved the amount never matters. So he kept a cigar box full of pennies and when we had the games, he got this cigar box out with these pennies. So we all got our supply of pennies and we bet pennies with it. So that's how we would do the games.

He often played chess with people and he was very good at it. So he would smile and tell me that "I'm going to get my lawn mowed Saturday. I have a game of chess with so and so. He's coming out to play chess with me. I'll get my lawn mowed." I said, "Well, how's that?" He said, "Well," he said, "I look, I move, and then I tell him, 'When you're ready and have made your move, come and get me,' and I go out and I mow and I mow and I mow, and finally they come and get me. I go in, take a look, I make a move and I say, 'Okay, when it's time, you come out and get me." I mow and I mow and I mow." He said, "I always get it mowed by the time we're done playing chess." [laughs]

We had a Dutch fellow hired that was a mathematician and had calculated that the unit membrane in the two little black lines were not wide enough. Biochemically they had to be wider than what we could see in the electron microscope and that was one of his jobs. Obviously, this guy's Dutch, he's good at chess. He says, "I just got here. Prof invited me to come up and play chess. Can you tell me anything about being with Prof?" and I said, "Well, Csuli always said 'Don't forget he's the boss,'" and I said, "You're probably pretty

good at chess, so maybe to start with, would be better if you don't beat him." And, "Oh, okay." That was just casual conversation. Monday morning he comes in with a huge smile on his face and he said, "I want to thank you. I want to thank you," and I said, "What for?" He said, "Well, I got to playing and I got really involved. Suddenly I realized I was winning." He said, "I had a terrible time losing, but I lost! I lost!" [laughter]

Another thing—when the pharmaceutical companies got the idea that Vitamin C would cure a common cold, they overdid it in terms of advertising and Prof wrote to them and told them that you cannot do that. It's not a cure for the common cold. Now, after they got his letter, advertisements by them came out again. That was the only legal thing that they had to stand on in terms of suing them. Before that, I guess legally you couldn't until you warned them, but he warned them and they did it anyway.

So they made a financial settlement with him, and it's all him and stuff he's done before he'd even come to Woods Hole, but he gave each one of us four hundred dollars because he said, "You're part of the Institute. You're part of what's going on. You've got to be part of what comes in," and he gave us each four hundred dollars. You know, like I say, I lived in the world of white. Of course, you've heard the story about how he gets up and lectures and always says he fishes with a big hook.

AK: Yes, he'd rather not catch the big fish than not catch the little fish.

DP: He wants to catch the big one. Did I show you the picture . . .

AK: No.

DP: Since I was doing a lot of photography all the while, I got the idea that since I had watched Prof stand up and lecture and point at pictures on the screen, and point at places in muscle where things biochemically were going on, that it would be nice to have a picture of him there pointing. So we put the picture together and there was a book that was going to be published. [George] Gamow, who was the father of the big bang, also had showed us how to pile books off a table so the top one was further off and wouldn't fall; of course if there was enough weight if you had three books it won't fall. And that's in the book, too.

So I put it together and since I had the magnification of the muscle on the picture, we then calculated it for a six foot person, and measured the length on the picture, and we put the linear shrinkage of Prof on there. I of course showed it to him to make sure it's okay, and he was extremely proud of the picture, because, "The only time in public I've been linearly shrunk." So he went around very happy and bragging about the picture and I gave him a number of copies that he could do something with, if he wanted to.

AK: A copy of that you've given to me.

DP: Yeah, so that you can have it.

AK: We've covered what I planned to cover with you, but is there anything else, any anecdote or anything you would like to say about Albert Szent-Györgyi as we conclude this very interesting review of your experiences with him during those very productive years at Woods Hole?

DP: Yes, it was probably the most productive decade of my scientific life. I did well with the space agency, but the spinoff of being with him, the methods of doing research, the charisma of having been associated with him, all followed me and were very beneficial for me. I suppose if there is such a thing as the hereafter, I'd like to think that he's listening and smiling right now. When I think back on it, I often think that fate seemed to often step in at the right moment for me so that things could happen that made me the luckiest person that I could ever imagine to be.

When you grow up in a little town of 1200, 1201 actually—when I went off to war a buddy wrote to me and told me they crossed off the "1" and were buying German war bonds [laughter]—and I peddled newspapers for a dollar a week, and then I think of all the things that came about and how they happened, and it seems incredible. One person even mentioned to me that if I were a cat I'd be dead because they have nine lives and I've had more than that. I got blown up and was wounded in the war; I've crashed an airplane that I was actually the pilot of; been in a huge car crash pileup, on and on, and it just seems that there's some hand that's hovering over me.

AK: And Szent-Györgyi was a big part of that providential good luck.

DP: Oh yes, because you are bound to pick up, let's say habits, ways, methods, approaches, ways of looking at things that you know are the best ways to look at it in the long run. And early on I had made up my mind that to be successful I would never walk over anyone to be successful. And anytime I could put my hand out and help them I would, even if it meant taking longer to get where I was going. That didn't matter. I'm very grateful when I look back on that, I wonder how many other people are ever this lucky?

AK: Dr. Philpott, that is a nice note to end our interview on. Thank you very much for welcoming me to your home and for sharing all this information with me. . . .

[End of Interview]

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