



Charles Newton, 1979

CHARLES NEWTON (1907 - 1994)

INTERVIEWED BY
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Subject area

Administration, humanities

Abstract

An interview in two sessions, January 1983, with Charles Newton, lecturer in English, emeritus, in the Division of the Humanities and Social Sciences. Mr. Newton graduated from the University of Chicago (PhB 1933). During World War II, headed public relations at MIT Radiation Laboratory, under directorship of Lee A. DuBridge, who subsequently became Caltech's president (1946-1969). In 1947, Mr. Newton came west to Caltech at DuBridge's invitation, assuming the title of assistant to the president. Here he worked mainly in public relations, publications, and fund-raising for the institute, notably helping to run the 1958 development campaign, which raised \$18 million and added eighteen new buildings to the campus. He resigned as assistant to the president in 1966 and became a full-time lecturer in English in the humanities division, becoming emeritus in 1975.

In this wide-ranging interview, he discusses his college days at Chicago; his early career in advertising and writing for radio; his friendship with Chicago classmate Louis Ridenour, which led to the appointment at the Rad Lab. He recalls his Rad

Lab days and the offer to come to Caltech as Dubridge's assistant. Campus atmosphere in the postwar period. Relationships with the trustees. 1958 development campaign. Nature of the undergraduate student body. DuBridge as fund-raiser; contrast between the administrations of R. A. Millikan, Dubridge, and Harold Brown. Faculty opposition to nuclear test ban. Caltech's attrition rate. Teaching humanities; evolution of the humanities division. The interview concludes with a number of amusing anecdotes.

Administrative information

Access

The interview is unrestricted.

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CALIFORNIA INSTITUTE OF TECHNOLOGY ARCHIVES

ORAL HISTORY PROJECT

INTERVIEW WITH CHARLES NEWTON

BY RACHEL PRUD'HOMME

PASADENA, CALIFORNIA

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ORAL HISTORY PROJECT

Interview with Charles Newton

by Rachel Prud'homme

Pasadena, California

Session 1

January 1983

Session 2

January 25, 1983

Begin Tape 1, Side 1

PRUD'HOMME: Mr. Newton, tell me a little about your background, where you came from, your family.

NEWTON: I was born in Frankfort, Kentucky. My parents were born in Frankfort, Kentucky. Their parents were. I'm the third Charles whose elder brother is Joseph. My family were farmers. My great-great-grandfather, Elisha Winter, was president of the first railroad built west of the Alleghenies—the Louisville & Cincinnati Railroad. It ran from Lexington, Kentucky, to Frankfort, and ran off the track at the end. He was also on the board of Transylvania University, which was used as an example by Thomas Jefferson. When Jefferson was setting up the University of Virginia, he said, "Let's be like Transylvania." It's a Greek revival building, beautiful. And it was *the* university, the first west of the Alleghenies. My great-great-grandfather's son was a schoolteacher. They were farmers around Frankfort, which is the state capital.

PRUD'HOMME: And where did you get your education?

NEWTON: Lots of places. As people did then, and as they did in the Middle Ages. People just changed schools, they didn't call it "dropping out." My family moved to Chicago when I was six. I went first, after high school, to the Art Institute, thinking I would be an artist. And then I found out I was more interested in theater, because there was a theater around the corner. So I dropped the Art Institute and enrolled at the University of Illinois for a year, in 1924. There, I wrote for the newspaper—I wrote a lot.

Then I stayed out and worked for a year, because there wasn't money enough for both my older brother and me to go to college. Then I went to the University of Kentucky for half a year.

That was in 1929, the big crash year. My father sent me some money and said, "This is all there is. This will get you through." So I took the money, borrowed a fur coat from a friend, and spent the money on moonshine. And he and I stayed drunk for about four days, and then I went back to Chicago and went to work. I went to school to learn to operate an electrical typewriter. Then I went to work as night manager of the Western Union Telegraph Office and enrolled at the University of Chicago days. I would work from four to midnight, and then in the daytime I had a two-thirds load, not full. And I was happier than a clam. I was the richest kid in school.

PRUD'HOMME: Did you go back to Chicago because of the university or because you could get a job there?

NEWTON: It was because I knew the University of Chicago was a good school. When I was at the University of Illinois, I went to the dean and asked him, "What's a good school?" He told me, and I couldn't afford any of them. Yes, I knew Chicago was a good school, and also it was in my neighborhood—both on the South Side of Chicago. So, I had five years at the University of Chicago. It was great. I had a lot of money, and I had a lot of friends. I wrote for the college's comic magazine, and when I became a senior, I wrote the college musical. Every year there was a competition for who writes the college musical—you know, it's like Hasty Pudding and the Triangle Club. So I wrote ours, and that was great, a good time.

PRUD'HOMME: So, actually, you had more experience writing by the time you graduated than in anything else?

NEWTON: Yes.

PRUD'HOMME: And you went into writing, didn't you?

NEWTON: Yes. My teacher was Thornton Wilder, and he became my great friend. Actually, we—my brother and I, and two of my classmates—had a gang. We rented a flat, which we called the “Fun Flat.” We didn’t live in it, we just had parties in it. And we had a bunch of people; we adopted Wilder into our gang. One of the gang was a woman who was the art critic for the Hearst paper in Chicago, so she was a member. She gave parties.

PRUD’HOMME: You’ve written for newspapers, radio, and advertising agencies.

NEWTON: Yes.

PRUD’HOMME: And then you went into the business of radio, and prior to working at Caltech, you worked at the University of Chicago.

NEWTON: Yes.

PRUD’HOMME: For their network educational programs. How did that come about? How did you shift from working in advertising and public relations?

NEWTON: I was a good friend of [President Robert] Hutchins and of the people there at Chicago. They knew me. I graduated from Chicago, got a job on a newspaper and became a feature writer, got fired.

PRUD’HOMME: Why?

NEWTON: Economy. Hearst had an economy squad that traveled around and fired guys, and the city editor would always say, “Hey, after these guys leave town, I’ll call you back.” But in the meantime, I’d gotten a job in advertising, writing radio. It paid three times as much as I’d been making; I’d been making \$30 a week. So I stayed in advertising. And then I thought radio wasn’t going to stay with us very long. I wanted to get into space [to write magazine advertising]. So I did—got a job and it was in New York. I stayed at that for a couple years. And then Hutchins said, “Come out and be

head of our radio thing.” I said, “I will, if you let me do experimental radio.” And he said OK. So I ran *The Roundtable*.

PRUD’HOMME: And what was that?

NEWTON: *The University of Chicago Roundtable* was the best known talk show of its day. It was produced from the campus. It would collect two or three or four scholars, and they would talk about a subject of national interest.

PRUD’HOMME: And this was broadcast throughout the country?

NEWTON: Yes, NBC’s Red Network. The anecdote there is that while I was running it, Bertrand Russell came to town, and I got him to speak, to join *The Roundtable*. It was a creditable performance all around. I went to get him before the show; it was winter, so you needed transport. I called from the lobby, and I said, “Is this Mr. Russell?” And he said, “Yes, this is Lord Russell.” I knew then who was who. It was the custom then, after the broadcast, to play back the recording and talk it over, so we did that. And then I took Russell back to his hotel. All the time I was making polite chatter, he didn’t say one word. As he got out of the car, I was saying a lot of polite goodbyes, and he said only this: “I’ve never heard my own voice before. I don’t know that I like it.”

The Roundtable was a good thing, and it ran well.

PRUD’HOMME: And, of course, it gave the university enormous publicity as a think tank.

NEWTON: Yes. All this time, I was working on [developing] a radio show that turned out to have a title, *America Votes*. The idea was that we would have three major auditoriums—one in New York, one in Chicago, one in Los Angeles. And these auditoriums would be wired so that you’d have a button at your seat and you could say, “Yes”, “No”, “Doubtful”, or “Stop it”, or whatever. And we would have the performers on the stage—the protagonists and the announcer. At all times, the listening audience would hear how the auditorium audiences were voting—“I don’t like what this guy is saying”; “I do like what this guy is saying.” But the speakers wouldn’t know anything;

they would simply be roaring on. In the end, we would have the consensus. I tried to sell this to the university's administration—to Hutchins and to William B. Benton [vice-president of the university]. Benton was more interested in real publicity and advertising. So I didn't put it over. I tried to give the project to Carnegie, and they almost took it up but didn't.

PRUD'HOMME: Then you moved to New York.

NEWTON: Yes.

PRUD'HOMME: And you went back into advertising, and copywriting specifically.

NEWTON: Yes. That's where I wanted to be. It was a reliable profession, as compared with fly-by-night radio. While I was doing that, the war came up. I tried to enlist in the military air transport, because I didn't want to get shot at. And I also wanted to know about engines—I'm a car nut. But we were living in Washington Square at that time, and we had an extra bedroom and bathroom at the end of the apartment, and my old classmate at the University of Chicago, Louis Ridenour, started dropping in on us. It turned out that he was commuting between Boston and Washington. And I said, "What are you doing?" He said, "Military secrets." I said, "How did you get in on it?" And he said, "I can't tell you what we're doing." So I went up to Cambridge [to the MIT Radiation Laboratory] and was interviewed by [Lee A.] DuBridge and hired. And then I started writing for them.

PRUD'HOMME: What was DuBridge's title then?

NEWTON: He was director of the MIT Radiation Lab. It was only *at* MIT; it was government-owned and paid.

PRUD'HOMME: How did he come to be director?

NEWTON: That's a long story that I'm not well acquainted with. There was a microwave committee headed by Alfred Lee Loomis, and they chose DuBridge to be director. I believe he was, at that time, a dean at the University of Rochester. There was no question from the start that he was a good man.

PRUD'HOMME: And DuBridge hired you?

NEWTON: Well, actually Louis Ridenour hired me. The Radiation Lab was composed of nine divisions; Ridenour was head of one division. But also, he was a political honcho. In an informal sense, there were about three or four or five guys who ran the Rad Lab at that moment in its history. And he was influential. He hired me to be in charge of photography and publications for his division, airborne radar. But in no time at all, I was doing it for the whole lab. And in the end, I had four movie units, about twenty people. We produced all sorts of things.

PRUD'HOMME: How many people were in the lab?

NEWTON: It was the biggest military research lab in history. It outnumbered the atomic people, right up to almost the end—I think the atomic people then outgrew us. It was about 1,500 people.

PRUD'HOMME: This was entirely to do with radar?

NEWTON: Yes. Nothing but radar. And that means sending out a pulse, bouncing it, and getting it back. That's all it did.

PRUD'HOMME: And the people came from all over, or had they originally been based in the East?

NEWTON: They came from all over. The physicists are a very tight club, internationally. They know one another intimately by their writings.

PRUD'HOMME: Was it was an international group?

NEWTON: Yes. There were Dutchmen in there, and Frenchmen. What they did was scoop up the best people. And I said to Ridenour, "Gee, this is a great idea, get the best people. Do you do that for everything, like carpenters and chemists? Why just physics?" And he said, "Well, what else is there?" [Laughter] They had all kinds of people, good people.

PRUD'HOMME: So, DuBridge's job was almost entirely administrative.

NEWTON: Yes. And he ran it permissively, as he would later run Caltech. He was governed, I believe, by the wish to get people working of their own volition all together. He was not a hero figure, like [Robert A.] Millikan [Caltech head 1921-1945].

PRUD'HOMME: To whom did your materials go?

NEWTON: The deputy director of the Rad Lab was Wheeler Loomis. There were actually two deputy directors; the other one was I. I. Rabi, a Nobel laureate [1944]. Rabi was a theoretical physicist. His concerns were intellectual—advanced development, stuff like that. Wheeler Loomis was minding the store. He was personnel manager of the lab; he hired people and saw to it that they got put in the right place. He was my boss, after Louis.

PRUD'HOMME: What happened to the Radiation Lab at the end of the war?

NEWTON: It was entombed in a delicious document. I wrote a history of it.¹ My unit was the public-relations department of the Rad Lab. Its serious publication was a twenty-eight-volume series, described as the biggest scientific publication enterprise in history—and it was, at the time. I was production manager, with 200 draftsmen, 200 writers, and all that stuff. But I wasn't the intellectual director; the editors were Ridenour and Rabi.

¹ Newton, Charles, Therma E. Patterson, & Nancy Joy Perkins. *Five Years at the Radiation Laboratory* (Cambridge MA; MIT, 1946).

PRUD'HOMME: And this series went subsequently to other educational institutions?

NEWTON: Yes. It's still a great document. Every university library has it, and they all still refer to it—all microwave theory and practice.

PRUD'HOMME: Of course, there had never been any of that before. It was all new.

NEWTON: Yes. And it was Ridenour's vigor and energy that put that through. And Rabi's brain, too.

PRUD'HOMME: You went back to New York after that and back into advertising. What made you decide to move, then, all the way across the country to an educational institution?

NEWTON: Well, World War II was an enormously exhilarating experience for me, especially being with those people. I don't knock advertising people; I think they're among the brightest people in the world. But the physicists were brighter, and I liked that. When I went back to New York, I realized that I was just being a traffic center for money.

PRUD'HOMME: Were you married at that time? Did you have children?

NEWTON: I married in 1937, and by then we had one child, aged two. And we had a beautiful fieldstone house outside Greenwich, Connecticut. My wife was Nancy Kennedy, from a long line of small-town newspaper editors. She painted, and we enjoyed ourselves.

PRUD'HOMME: Who actually made you the offer from Caltech?

NEWTON: DuBridge.

PRUD'HOMME: What did he want you to do?

NEWTON: Take care of public relations for Caltech. And I couldn't do it.

PRUD'HOMME: Why?

NEWTON: Oh, I guess I was too newly moved from Cambridge to New York and getting started. It was just too much of a wrench. Then a year later, he wrote me again and said he wanted me to take charge of not only public relations but fundraising, alumni, and the whole front.

PRUD'HOMME: How long had he been president at this point?

NEWTON: He left Cambridge to become Caltech's president in '46, and it was in '47 that he wrote me for the second time.

PRUD'HOMME: So he had had time, by then, to get to know the institute and form his impressions of what he wanted to do.

NEWTON: Yes.

PRUD'HOMME: What were your first impressions of the Caltech community? Had you been out here before?

NEWTON: No. I came out here the second time he called me, in '47. He said he wanted me to come out and talk with the trustees' committee in charge of fund-raising. So I got my best tailor-made suit and everything and went out and was put up at the Athenaeum. I thought it was dismal; the halls echoed. I had a friend from the University of Chicago, Katherine Dunham—she'd been a graduate student. She was a black dancer. She was living with one of the ["Fun Flat"] guys, John Pratt. By then, she had had great success around the world and had her own traveling company. And she was in Hollywood. So I called her up, and she said, "Come out and have dinner." I went out and had dinner. Dinner lasted till about three in the morning. We cruised all over town and went to Romanoff's. When I came back to the Caltech campus, I thought, "This isn't bad"

[laughter]—living in a monastery and having a hell of a time. But the main impression that remains was that Lee and Doris DuBridge had me to lunch the next day—this was in January. We lunched outdoors on the patio, with the sun beating down on us, and that was all I needed. And, of course, I really wanted to get back to the company of intellectuals—physicists, scientists.

PRUD'HOMME: What was the Caltech community like then?

NEWTON: I had no idea. All I knew was DuBridge and two trustees. My first perception of the Caltech community was when I was adopted by a group of Charlie [Charles C.] Lauritsen's physicists. As everybody knew, they were heavy drinkers. So, there were big, big parties and lots of gorgeous singing and lots of drinking. That was my first impression of the Caltech community. They had lots of fun.

PRUD'HOMME: Did they pay you much?

NEWTON: \$12,000.

PRUD'HOMME: That was a lot in those days. What was your title when you were hired?

NEWTON: Assistant to the president. I told DuBridge, when we were corresponding about the thing, that I thought an appropriate title would be vice president. But he quietly said he'd call me "assistant to the president." It turned out later that Jim [James R.] Page, the chairman of the Board of Trustees, believed that explicit, overt money raising was *infra dig*. You don't have a money-raising department. You have the president, who should be someone like Millikan. Even DuBridge was low-class to Page. So I was really smuggled in. And a lot of people, to the end, thought I was DuBridge's secretary. But I did all this money raising under his cloak.

PRUD'HOMME: He really wanted the institute explained to the public, because the public didn't know much about this place. How did you know that the Board of Trustees would take you seriously? Did you have any trouble convincing them?

NEWTON: Once again, I did nothing. I would say to DuBridge, “Let’s do this,” and DuBridge would do it or not. And often not. So I was always the secret worker. “Assistant to the president” can mean anything. DuBridge was the guy.

PRUD’HOMME: It also meant he could ask you to do a wide variety of things.

NEWTON: Yes, but he never did. Well, no, that’s wrong, of course he did. But in the main, he did with me as he did with others—let go.

PRUD’HOMME: But you weren’t just involved with money raising. You were involved in all aspects of the program to disseminate information about Caltech?

NEWTON: And everything else. One of my friends said that a drunk physicist at one of those parties said, “Newton? Oh, that’s the 65-percent president!” I was really sort of the doorway whenever they came around.

PRUD’HOMME: Did you bring anybody with you when you came?

NEWTON: Well, right after, yes. I brought my assistant from the Rad Lab, Nancy Perkins. And I brought Lucie Sewell, who worked for me at the Rad Lab. We began small, with the three of us in the office.

PRUD’HOMME: It must have been quite a change to that from the Radiation Laboratory. How did you get involved in admissions and recruitment?

NEWTON: That’s part of public relations.

PRUD’HOMME: And what was it like when you first came? What was the admissions policy and practice?

NEWTON: The dean of admissions was [associate professor of English] Louis Winchester Jones. Caltech administered its own entrance examination, which was composed by

Caltech people. They divided up, traveled around the country, interviewed the high school students, and brought them in.

PRUD'HOMME: The students didn't have to take college boards, then?

NEWTON: No. I just got into it, I don't know how—because it was publications and public relations, and that was my interest. I wrote a booklet called *Facts About Caltech*. I wrote it with Jones, and that was a good booklet.

PRUD'HOMME: What kinds of students did Caltech have?

NEWTON: Same as now, just the best high school science students there are. These science students would know about Caltech and they would write to us. And this is a very important point. Quite early, I, as a public relations guy, wanted to show that Caltech produced a greater number of distinguished scientists than anybody else. So I got into that study and found that, indeed, Caltech did. Then, pretty soon, I began finding out that Caltech didn't produce student scientists, Caltech was *chosen* by the high school students and they went on to be distinguished themselves. That seems superficial, but it's not—it's fundamental. It says that the individual does his own work, not [because of his] environment. Right from the start, students knew that Caltech was a distinguished place and they chose us.

PRUD'HOMME: What was your approach to development? “Development” is a buzzword, actually. I don't really like it.

NEWTON: I didn't like it at all, and neither did the profession. They looked for another word and settled on “advancement.” But that didn't last, and “development” remained.

PRUD'HOMME: Well, we're talking about two basically different things: One is the raising of money and the other is the publicizing of the institute. They happened to work together—one feeds the other. For example, the Bill Benton approach at the University of Chicago, which is a kind of broadcasting the seeds as opposed to planting each one.

NEWTON: Yes, exactly.

PRUD'HOMME: Were you in favor of that, just getting as much information out as possible?

NEWTON: No, I wasn't. I was for doing substantive work. One of the first things I did was meddle with students—with admissions and recruiting. I wrote a movie called *Careers for Youth* (1954). Frank Capra masterminded that movie and put his imprint on it—unspeakably jolly. But it was full of the things I wanted. When I wrote *Facts*, I meant facts. Most college promotional literature says that we believe in enhancement of spiritual values and so on. I began mine by noting that Caltech is twenty-five miles from the beach. I did nothing but facts. And then I started attacking myths—the myth about the Caltech student as remote, queer, confined, cramped. And I had evidence to show irrefutably that Caltech students are more active. They do more things. They do more social things, they do more political things, they do more athletic things—they're more active in every way than the average college student. And they're exuberant. So I said that.

PRUD'HOMME: Did you go into the fact that they would be more useful to business or industry because they were better trained and brighter, or didn't you do that kind of thing?

NEWTON: No. I wasn't trying to sell Caltech students to their employers, because you don't know who their employers are. Eighty percent are educational institutions. No, I was trying to get students to come to Caltech.

PRUD'HOMME: Did you have a lot of money for development?

NEWTON: I always had enough. I was never aware of being pinched.

PRUD'HOMME: And who were the donors to Caltech?

NEWTON: They were heterogeneous. The most identifiable body was the corporations, and I went for them first. I founded an organization called the Industrial Associates.

PRUD'HOMME: What was that?

NEWTON: They're major national corporations, like Monsanto and Standard Oil—all the giants. Industrial Associates is a generic idea that was invented by a vice president of Standard Oil of New Jersey and Robert Maynard Hutchins. Eger V. Murphree was the Standard Oil vice president in charge of research. According to Hutchins, they were on the train together, and Murphree said, "You ought to get big national corporations together, make a club, charge them money, and give them access." So Hutchins did that, and his name for it was "institutes." With the aid of those corporations, he established the Institute for the Study of Metals, and now there are three major institutes at Chicago. Then MIT picked it up right away—this was about 1948. And as soon as I went to Caltech, I stole it. I set it up, but I did it much better than Chicago.

PRUD'HOMME: In what sense?

NEWTON: More organized access—preprints of scholarly publications. Preprints give you a year's lead sometimes. Organized visits back and forth, regular visits. A system for encouraging the relationship between the important research people in the company and our people, who were all, by definition, good.

PRUD'HOMME: Did the academic community here resent the intrusion of the Associates?

NEWTON: There was a committee for that, and they were quite skittish about it. Two of the most alarmed were [physicist] Tommy Lauritsen and [chemical engineer] Bruce Sage. So I said to DuBridge, "Send them back to MIT to study MIT's operation." DuBridge did, and they came back and were very cross with me and said, "Why didn't we start this earlier?" [Laughter]

PRUD'HOMME: So you started the Industrial Associates. What about the Pasadena community, and the Los Angeles community? Was there a good relationship between them and Caltech?

NEWTON: Yes. Caltech wasn't big enough to spoil its perimeters, as a successful university always does. The story is that somebody said you ought to get community relations. So DuBridge and I called the president of the local bank, Security First, and a prominent Pasadena lawyer, and had lunch. DuBridge said, "We want to improve our public relations." And they got very round-eyed. They looked at one another, and said [in a whisper], "Stay away from Colorado Boulevard. They're a bunch of car dealers and storefronts, and they'll walk all over you, and they'll get you involved in city politics, and they won't give you any money. Forget about them." So we forgot about them. I turned my back on the Pasadena community, because Pasadena is a bedroom city.

Our neighborhood is really Southern California. And that was clear and explicit and strong with me; I never allowed any attention to be diverted. We had about three movements toward community relations; they'd appoint a faculty person to go out and talk to the city mayor and stuff. Nonsense! It's a waste of time. We're not parochial, we're international. Dwain [Fullerton, vice president for institute relations] called me in to get "the benefit of my wisdom" when he first came here and asked me about public relations. He had hired a guy to do local stuff, and I told him this story. Well, they split their sides laughing, but they kept on doing it.

PRUD'HOMME: What about the alumni? Were they involved?

NEWTON: Yes. I pushed my way into that. They had a magazine [*Caltech Alumni Review*] that was edited by a faculty member, Don [Donald S.] Clark [professor of physical metallurgy and secretary of the Caltech Alumni Association]. It was negligible; they'd get an engineer somewhere who'd turned in a scholarly paper and Don would reprint it in the magazine. So I hired Ed [Edward] Hutchings [editor of *Engineering & Science*, 1948-1979] right away, within the first few months. And Ed came out and did a marvelous job. Then I realized that the Alumni Association was being run as a

gentlemen's club—not only here, but nationally. And in fact, there were two organizations of alumni secretaries.

PRUD'HOMME: Of course, that was a tradition, too, at that point.

NEWTON: Exactly, the Ivy League began it and all the other guys followed. But these two national organizations were different. One of them was a gentlemen's club bunch, and the other one said, "Alumni are a source of money; we can go out and ask them for money." And they fought. But the money raisers won. By the way, everything that happens at Caltech reflects everything that happens nationally; everything is the same. So, gradually, I professionalized the alumni thing. First, with a professional editor, and later with professional money-raising techniques. And where once the alumni roster had been kept in a shoebox, I got it on a mailing machine.

PRUD'HOMME: To what degree was Caltech supported by the government at that point?

NEWTON: Negligibly. In 1947, before I went to Caltech, I read about a meeting of the AAU [Association of American Universities] in which a college president said, "I will not accept government money." Within a year, they were saying, "How will we get government money?"

PRUD'HOMME: Millikan, of course, was very much against government money.

NEWTON: Yes. He wanted it on his own terms. We didn't deliberately go after government money for some years—I don't know how many. We knew it was coming.

PRUD'HOMME: Though, when you looked at something such as the Radiation Lab, it must have been rather tempting to go out and plug into that kind of funding.

NEWTON: No, we put the Radiation Lab in the context of war. I never thought of it that way. No, we were so busy getting private money—or, I was—I didn't think about government, until about 1954 or '55.

PRUD'HOMME: Did you ask the large companies to give you blanket grants, or did you ask them to give specific grants?

NEWTON: That's what the Industrial Associates was about. It was unrestricted money. It would have to be; that's what we said. We said, "We only want free money." Up to that time, contract research was not as hot an item as it is now, but they did give money for specific purposes. We even had an offer of money from a union of shoe clerks to produce a good shoe, but we didn't take it. So, yes, company money was tied to specific results. In 1950, the corporations formed a volunteer group—a very powerful group. People like Dave [David] Packard [president of Hewlett-Packard] were members of it; Bill [William S.] Paley [CEO of CBS] was in it. And they said, "We've got to give unrestricted money to leading private universities, and *only* leading private universities." It was a very strong thing, and it went for many years, and then it faded away and fell apart.

PRUD'HOMME: Has there ever been a rivalry between UCLA and Caltech in the science department?

NEWTON: No, not that I know of. I made a speech at the end of our [building] campaign in which I attacked the growing practice among public universities of appealing for private money. I said, "You're not only working both sides of the street, you're not telling the truth to either one. If your work is good, then the public ought to support it. You shouldn't go somewhere else and get it."

Begin Tape 1, Side 2

PRUD'HOMME: In 1958, you announced the development campaign and raised \$18 million. Who started the campaign?

NEWTON: Me.

PRUD'HOMME: Who determines what buildings are needed in an institution?

NEWTON: In 1948, there was a study made and architects were employed.

PRUD'HOMME: So, this would have been one of the first things Lee DuBridge did—do a survey of the needs.

NEWTON: Yes, he knew from the start that money raising had long been overdue. In December 1952, Pereira & Luckman was appointed consultant in devising a program for future development of the campus. DuBridge asked all of the division chairmen to write what they needed in the way of buildings. So they did.

PRUD'HOMME: It must be very difficult to plan for the future and determine, in a scientific community, what you're going to need.

NEWTON: Yes. After the campaign was over, and we'd put up our eighteen buildings, I studied it in detail. It takes two years to build a building, seventeen months to raise the money for the building, and three years for the scientists to make up their minds what they want the building for.

PRUD'HOMME: After the fact?

NEWTON: No, when we began asking, "What do you want?" Then they'd start running into one another and disagreeing.

PRUD'HOMME: So Pereira & Luckman formulated its plan, with the approval of the Board of Trustees, presumably.

NEWTON: Yes, and it was a dumb plan. They simply took what information was available, which was, at that stage, mainly chitchat—the head of the engineering division would say, "We need 30 percent more space, and when we get it we'll be short of space again." They took talk like that and laid out a bunch of dominoes, which is a dumb campus plan. It's nothing like what's being done now. But there it was; it was

something you could point to and say, “This is the campus of the future, and give us some money for it.” But nothing happened.

PRUD’HOMME: You mean, the plan just sat there?

NEWTON: Yes. Well, we talked about it, of course. It became evident that we had to have a campaign, had to have an overt, *boom-boom* campaign. But not everybody believed that, because Millikan’s experience had been that you don’t do that. You know a very rich man, and you bring him out, and you mesmerize him, if you’re Millikan, and then he gives you the money. It was what Jim Page called the “silk-stocking business,” and it should be. Money raising should be done by people who have socio-economic stature.

PRUD’HOMME: And you were being thought of as crass, by going out and soliciting funds.

NEWTON: I was just making it into a manufacturing operation. That was not agreed to by everybody, and even DuBridge was unconvinced. Because if you come out and say, “We’re going to have a campaign,” then if your campaign flops, you have egg on your chin.

PRUD’HOMME: What changed their minds?

NEWTON: By scouting about and talking to people, trustees. The turning point was when one of our influential trustees, Ed [Edward R.] Valentine, said, “Of course you’ve got to get professional counsel.”

PRUD’HOMME: Meaning, professional fund-raising counsel.

NEWTON: That’s right. That was the way to get your foot in the water. So I went East and talked to professional consultants. And the result of that was we hired an outfit

called Kersting, Brown & Company. They spent some months convincing the trustees that we did need an overt campaign.

PRUD'HOMME: This was for building only, not for endowment.

NEWTON: That's right, it was a building campaign. So we hired Kersting, Brown, and they forced us to put one foot before the other.

PRUD'HOMME: Were the trustees the biggest hindrance to this, or was it the faculty?

NEWTON: Not the faculty at all. They weren't consulted. All they wanted was buildings, and any way you got them was all right with them. It was the trustees who were hesitant. And DuBridg was hesitant, too.

PRUD'HOMME: Really? The master fund-raiser of them all?

NEWTON: He's a marvelous guy; he's the most honest man I've ever known. And he raises money by being what he is, not asking for money—he would never ask for money. Well, first of all, let's do the chronology. We did hire Kersting, Brown. They did get us over the threshold, and we did decide to have a campaign and to set a date for it. We did appoint a chairman for the campaign—that was John A. McCone. Then there was a dust-up about a nuclear test ban, I believe. Linus Pauling was for it, and he signed up a bunch of national scientists. That, to McCone, meant that they were all Communists. McCone was determined to root out Communism wherever it showed its head. The moment of truth came when Kersting, Brown's representative—his name was Al Crawford—and I went to see McCone on, let's call it "D-Day." We wanted to put before him the findings and say, "Will you back these plans?" Well, we went to his house and sat down and gave him a preview. And he said, "I will not support that. I will not do anything for you. I will not do anything for any money-raising until I get Linus Pauling fired and Lee DuBridg, too." We listened to the quiet tirade. We left and drove off, and in two blocks I stopped the car and I said to Al, "Write down what you've heard, and I will, too. And we'll never tell anybody about it." So that's what we did. Of course, we told

DuBridge—we didn't tell him in full detail, because McCone had said DuBridge was a Communist. But it was clear we needed another chairman, so we picked another trustee, Arnold Beckman, to be chairman of the Development Council. We picked up and started all over again.

PRUD'HOMME: Did McCone resent that?

NEWTON: We never spoke to McCone after that, nor he to us. No, he said, "I will not resign from the Caltech board. I will stay on the board until I've got Pauling fired and DuBridge, too, if that's possible." They took him off the board, because he got the CIA directorship [1961]. A bad man.

We then did what our professional counsel told us to do. We set up committees for business, for regions, and for alumni, and so on. Our method of operation was that Al, the Kersting, Brown man, and I would get our plans together, and then we'd go out to see Arnold Beckman in Fullerton and he would go over them with us. And he would say, "Now, we're going to have a meeting of the Development Council." And we'd go to the meeting, and Arnold would sit down and I would sit at his right, and Al would sit at the other end of the table with his pad. Arnold would turn to me and say, "Well, Chuck, what do we talk about today?" And I would point to the agenda that I'd given him and he'd go through the agenda.

After about three of those meetings, I realized that we weren't getting anywhere. Three meetings takes three months, easily. I also had realized that two trustees, Lindley Morton and Earle Jorgensen, were really involved. They wanted to work. Lindley would come over—he was a retired capitalist—and say, "Well, Buster, what's on your mind?" So these guys were working. And finally, at the end of this period, I said to Lindley, "What's going on here? Only three guys are doing the work." And Lindley was very cool about it; he said, "Of course, that's the way with every board, only three people do the work." And I was thunderstruck. You know, this was a revelation. I've since appropriated the whole rule—I call it "Newton's rule of three." Everywhere I've been, it turns out that three is better.

PRUD'HOMME: Of course, it has its own limitations. It's really more difficult to work with more people. It's much easier to work with two or three.

NEWTON: Oh, how right you are.

PRUD'HOMME: But to whom did you appeal for money?

NEWTON: Oh, we divided them all up into those categories. But it turned out that the people who were the sources of money were the trustees themselves.

PRUD'HOMME: Not the direct sources, but the indirect sources?

NEWTON: They were both. In fact, it came from them, their companies, their foundations. But among the professionals, it was said that you got 75 percent of your money from one-third of your prospects. That's not true, as I proved. You get 85 percent of your money from 2 percent of your prospects. Money comes in big hunks.

PRUD'HOMME: How do you identify the big givers? Or does the board do that, too?

NEWTON: The board doesn't do it. You ask the board, and then by talking to the board and listening to them, you find out who are the warm ones. Most of the board will tell you who's got money, but they won't go for it. You have to get your tough guy, Lindley Morton or Earle Jorgensen, to go for it.

PRUD'HOMME: What did DuBridge have to do?

NEWTON: Front man. He's a marvelous speechwriter and speechmaker.

PRUD'HOMME: Would his overwhelming honesty allow him to allow you to direct him?

NEWTON: No. I had a technique that I evolved with great pain, which was called a moving frame of reference. DuBridge cannot be told what to do. But you can talk to him about Standard of California and then come back to him a week later and say,

“Remember what you were saying about Standard of California,” and then come back two weeks later and say, “Your idea about going to Standard of California seems like a winner.” And then another time you say, “Lindley Morton thinks that what you’re doing with Standard of California is good”—that’s the moving frame of reference. He adopts it. But that’s part of honesty. He won’t be shoved around.

PRUD’HOMME: But you’re also dealing, again, with this change in mores, which is that it wasn’t acceptable to go out and hustle for money. I mean, it was just not done in private educational institutions; that didn’t come about until the sixties, really. And you were one of the first ones who did it.

NEWTON: That’s right. Our campaign was the first major campaign on the West Coast. Other colleges were very impressed, and they said, “OK, now we can do it, too.”

But let me come back to DuBridge. There are two generalities. One is that it was not being done, and that’s true. And the other is that everybody hates to ask for money, even the Earle Jorgensens and Lindley Mortons. DuBridge is an extreme example of that; he will not ask anybody for anything.

PRUD’HOMME: And yet his reputation is that of a magnificent fund-raiser.

NEWTON: He’s a charmer. He taught himself to be a charmer. He told me this. He told me that he met his wife, Doris, in an apple grove. The story is, she was walking through an apple grove and she heard a voice declaiming. It turned out to be Lee up in a tree, practicing oratory. When I knew him, he wrote his speeches in longhand. I think he still does. But he had perfected the art of reading so well that it seemed extemporaneous. He made himself, willfully, a public character. He is himself, truly, a private character. He does not want to be invaded.

PRUD’HOMME: Did he resent the amount of publicity the campaign was getting? The amount of effort?

NEWTON: No. As I say, he's aware of public relations acutely. That's why he hired me. He speaks well, and he did a lot of it. The literature is full of his speeches. He gave more speeches than Millikan ever did. And if you asked him to give a speech at, say, the steel institute, he'd do it. And that's what made his reputation: He makes good speeches.

PRUD'HOMME: What kind of printed materials did you use?

NEWTON: Every kind. You wouldn't believe it. I started doing literature to attract students. I moved into producing literature for fund-raising. And eventually, DuBridgE put all campus publications under me. Up to that time, they'd been under a professor of English, because the campus was an amateur operation.

PRUD'HOMME: Did *E&S* [*Engineering and Science*] come under you?

NEWTON: Yes. I hired the editor [Hutchings]. We had articles, dozens and dozens of them. Many of them I wrote; most of them I just supervised. I had a research assistant who was a miracle of industry and accuracy, so I could do a lot of stuff.

By the way, in publications, we turned out a flood of stuff for the campaign. And I analyzed all that when it was over. I showed in my paper that very, very little was produced by public relations and publications. The money is produced by one man asking another man for money.

PRUD'HOMME: You only spent half a million dollars.

NEWTON: I thought it was a little less than that. Anyway, it was 2.5 percent, which is low. It was a textbook campaign, just ran like a clock.

PRUD'HOMME: And it only took three years.

NEWTON: No, eighteen months.

PRUD'HOMME: There's this wonderful quote from you: "One year to plan, one year to work, and one year scraping the bottom of the barrel."

NEWTON: Ah, you read it. [Laughter]

PRUD'HOMME: Did the publicity surrounding the *Explorer I* satellite in '58 help any?

NEWTON: I think it was the day before we announced the opening of the campaign that the satellite went up. The headlines were great big block letters: "CALTECH SATELLITE DISCOVERS VAN ALLEN BELT." And what that produced was a \$10 check from a ten-year-old boy—that was the money produced by that publicity. We had editorials, too, the next day.

PRUD'HOMME: Tell me about [your talk] "The Shortest Honeymoon in History." What was the speech about? Why was there outrage?

NEWTON: The outrage came from pressure groups, two of them. The speech said that business is beginning to give money by formula and that isn't the way for a business to get the most out of its giving.

PRUD'HOMME: How do you mean "by formula"?

NEWTON: The formula here was that the Independent Colleges of Southern California—an association composed of Redlands and Pomona and Occidental, and other nice colleges—all got together and hired a secretary. The secretary would send out mailing pieces to corporations to ask for money. And the corporations said, "Sure," and would send a \$50 check. I said, "That's no good! You've got to get inside the vest. You've got to get a corporation that gives where it wants to give, and it has to be interested in it and know what the money is doing." I called it "thoughtful concerned giving," and stuff like that. I said, "That's the way for corporations to give, to select. If they want to select a poor college, fine. If they want to select a rich college, then it's got to be something that they want to do and are interested in, instead of sending fifty-dollar checks to fifty

colleges.” So, right away, of course, the organizations complained. That was all. Of course, it turned into ten letters from the guys who wanted to get my scalp.

PRUD’HOMME: Also, it’s a kind of elitist approach to the donating of money. You give it to the best, or you give it to something that interests you. You’re not democratic about it.

NEWTON: That’s right.

PRUD’HOMME: You don’t give it to everybody.

NEWTON: I’m sure you’re using “elitist” and “democratic” in quotes. I’d prefer to say “intelligent.”

PRUD’HOMME: But DuBridge backed you in this.

NEWTON: The correspondence shows that he did. My letters—I looked through the file—although too long, were an ample defense.

PRUD’HOMME: In the long range, it was a tempest in a teapot.

NEWTON: Yes, that’s right, exactly.

PRUD’HOMME: You became director of development in 1961. How did the nature of your work change?

NEWTON: I don’t know what that was. I had accepted the position of assistant to the president and worked that way, not as a line officer. Everything I did was through DuBridge. But actually, I had great power. After the campaign was over, we had the standard doldrums, and I tried to pull it together. I was part of the doldrums. And now to answer your question, I don’t know why I was called “director of development.”

DuBridge said that he was going to make me director of development. I said, “I would consider that a demotion. I’m assistant to the president.” So he kept me as the assistant

to the president but added the title “director of development.” And I paid no attention. Nothing I did changed.

PRUD’HOMME: Because the interesting thing, when going over your history, is that this came after the enormous campaign.

NEWTON: Yes. After the campaign, we fell into the doldrums. I tried to get myself going, and get DuBridge going, and nothing was happening. So I wrote memos saying, “What do we do next?” What we do next is have another campaign. I finally got another professional counseling firm, and they sent out a man—the routine, when you hire a professional, is that the professional goes around to your board and says to them, “Would you support the campaign, and to what extent?” In what way he does it is, of course, crucial. And he does it alone. This guy was an ex-track coach and gym teacher, and he was totally unsuited for talking to a sophisticated group like this. So it flopped, and the trustees said, “We don’t want to hear this!” My impression is that after about 1963 or ’64, after I’d had this failure, some trustees decided that I had lost my usefulness. I feel sure that Si [Simon] Ramo didn’t think I was suited to keep going, but I don’t know.

PRUD’HOMME: Of course they’d had no experience with campaigns, so they wouldn’t realize that this always happens after an enormous campaign.

NEWTON: Right. Well, I think, though, that there was a slackening all around. I went and devoted myself to direct solicitation of corporations. I manufactured a movie with DuBridge starring and took it to corporation presidents.

PRUD’HOMME: Did you consider that a success?

NEWTON: No, it wasn’t. It did bring in some money, but it was the wrong way to do it. Staff solicitation by a hired man just doesn’t work; you’ve got to have trustees do it. So that was a failure, too. And I think that somewhere along the line, it was decided that I’d lost my usefulness. This was ’63, ’64.

PRUD'HOMME: You kept on doing what you'd done before.

NEWTON: That's right. But then, when DuBridge told me that he was going to retire, I said, "I'm going to resign." So I did [1966]. I was offered a job as a vice president at the Western Behavioral Sciences Institute, in which I had become interested some years earlier—Carl Rogers and the sensitivity business. And then Hallett Smith [chair of Caltech's Humanities Division, 1949-1970] said, "Why don't you be a teacher like you always wanted to be?" I didn't know that I'd always wanted to be a teacher. I had been filling in as a lecturer for guys who were sick or on leave from time to time. So I took the job.

I really do believe—and as I say, this is all my thought, I haven't talked to anybody about it—that I fell off the train, or was pushed off.

PRUD'HOMME: Had the complexion of the Board of Trustees changed significantly during this period? Were you dealing with a new group of people?

NEWTON: No, it began changing just about then. I never paid any attention to the composition of the board or the size of the board. I had some cynical thoughts about it, such as that a big board will never get in your way. You, the president, can run a big board. But I was followed by a professional professional—a guy whose whole life had been in fund-raising. He championed the idea of a big board.

PRUD'HOMME: Who was that?

NEWTON: Russ [H. Russell] Bintzer. And I think somewhere on the board, possibly with Ramo, there was support for having a big board. At any rate, during that time, the end of the sixties and through the seventies, the board expanded enormously. In Millikan's time, the place had been run by four guys, and it still was in DuBridge's time—Jim Page and a handful of trustees. There was never any thought about professional boardsmanship. But now it is very professional.

PRUD'HOMME: Do you think it's necessary to have it as professional with an institution that's now as famous and complex as Caltech?

NEWTON: It still is the rule of three. But I think this big board is a good idea, and I wish I'd done it.

PRUD'HOMME: At what point did foundations start to become so important in institutional fund-raising? And how did you learn how to deal with it, how to approach the foundations?

NEWTON: By that time, I was a member of the board of the American College Public Relations Association, which was the national outfit of fund-raisers, in spite of its title. We talked to one another, and we talked about foundations. Everything that we said to one another, you could write. You would just go back in the kitchen and write it out. "The asker must have a good proposal." [Laughter] The determination to go after foundations is a different matter, and that was in my head. DuBridge was reluctant. For example, he would turn things down by short sentences, like, "You can't get money out of Texas." In fact, I have a note saying, "Everybody knows what government agencies are giving money, and there's nothing to be done there." Well, that was just before we started getting money, in scads, out of a *lot* of government agencies. But the main thing is the determination. You're going to do it or you're not. Then, how you do it is textbook.

PRUD'HOMME: Did Caltech always work with the Rockefeller Foundation?

NEWTON: Yes.

PRUD'HOMME: This had been going on since the telescope.

NEWTON: Yes. Yes, [George Ellery] Hale's telescope was the first. In fact, the story is that Hale, after conceiving the thing, wrote a piece for *Harper's Magazine*, explicitly to catch the attention of the Carnegie Foundation. But after that, [George W.] Beadle [chair

of the Division of Biology] and Pauling [chair of the Division of Chemistry and Chemical Engineering] went after Rockefeller for money for the chemical biology program. I guess that was one of the earliest foundation efforts.

Beadle, Pauling, and I went to New York, quite early—'48 or '49—to go to foundations and get money. We saw about eight or so, and nothing came of it. It was interesting, but it didn't work.

PRUD'HOMME: In the McCarthy era, the mid-fifties, what was the mood of the scientists with this business we were discussing before? Was there sort of a small civil war going on?

NEWTON: Not among the scientists. There were embattled scientists besides Pauling—Tommy Lauritsen, Robert Christy, and a few others. They were the ones who wrote the letter advocating a nuclear test ban to the Los Angeles Times [October 14, 1956] that enraged McCone. And I guess there were quite a few of them, and their hair would rise if you'd start talking about anything having to do with the business. Most of them thought, "Just let me get on with my work." But I got interested and I worked up an idea which said, "Let's go to the newspapers and establish it as a convention that if any scientist wants to talk about government policy, he may, but he will not use the name of his institution. And you, the newspapers, will not break confidence. You will just simply say, 'Linus Pauling, a chemist.'"

PRUD'HOMME: And the newspapers were willing to buy it?

NEWTON: We didn't get that far, because I talked to my friends—and they were my friends on the faculty—and there were enough of them who were enraged. Tommy Lauritsen said, "We *are* the institute." They wanted to use the institute's weight. But yes, there were impassioned people. And then there was this larger group who just said, "Please let us alone."

PRUD'HOMME: But they were tolerant of each other?

NEWTON: Oh, yes. That was just old Tommy snorting.

PRUD'HOMME: What changes have you seen in the kinds of students?

NEWTON: None.

PRUD'HOMME: And in the sixties, was there a great change?

NEWTON: Well, there were superficial changes. After the war, there were many students on military scholarships, government scholarships, who had served in the war. After the Korean War, there were others. They were older and more serious. But one thing you learn from my attrition paper² is that the students are almost rigid. Your flow of students is uniform through the decades. The attrition rate is almost within 2 percent constant from the 1940s to the 1970s, while the country has gone through enormous vicissitudes. The character of the Caltech student has remained the same; his performance is the same. It's extremely stable.

PRUD'HOMME: Has the background remained the same? Do they come from a wider economic base?

NEWTON: I have some materials on that but it's not organized. No, I wouldn't say so.

PRUD'HOMME: You have women now.

NEWTON: Yes, there's a lot of good stories about that. When we were first considering women, I was in on it. And Lee really recoiled. He said we'd have to put new toilets in all the buildings, and then we'd have to put up another dormitory, and we just haven't got the money. But then he did steel himself, and he called in Rosemary Park, the former president of Barnard. She came out and she said, "What's the problem? Have your women in the men's dorms." And sure enough, that's what was done. And we hired an interior decorator. She chose a wing in certain selected halls, and dressed it up and put in

² "Caltech's Student Attrition Rate," February 12, 1980. Available from Institute Archives.

curtains. And the girls came in and moved into the wings. The first year, one of my advisees—you know, every faculty member has advisees without regard to specialty—was a girl, and she got a blue slip in the midterm. I had to call her in and say, “What’s up?” She said, “I’m not having any trouble with the subject. Would you like to know how many men were in our wing last night? Twenty-eight!” [Laughter] Then about three years later, I was at a Blacker House tea—Blacker has an annual tea. And one of my former students came up—she was a senior. I said, “How did the wings work out?” She said, “Oh, the wings, I remember them. They were kind of nice. They had nice curtains and good furniture. But we moved out of them the first year. Now we stay anywhere we want to. We do have a rule, though, and that is, you knock before you go in the shower. And I always forget.” A big guy standing next to her says, “Takes too much time.” The blend is complete.

Begin Tape 2, Side 1

PRUD’HOMME: You said you had some stories.

NEWTON: We knew the DuBridges as friends at the MIT Radiation Lab. And when they went down to Nantucket or the Cape for little weekends or vacations, they would sometimes ask us down. So we got to know them pretty well. And when we came out here to settle down, Doris and the office people found a house for us, and Doris filled the refrigerator with food. We moved in in the afternoon. She was a great person. So we settled in and we were still settling in at midnight. We were in bed, and around midnight we heard a boom. Then the phone rang. It was Doris, and she said, “Yes, that was an earthquake.” That was our first earthquake. Took all the fear of earthquakes away.

PRUD’HOMME: I’d love to hear more about Lee DuBridge. About his approaches to people, for example, when he’s dealing with money questions.

NEWTON: Lee and I are good friends. As soon as I came out, Lee took me to the Greek Theatre to see a Lehar musical about money, *The Merry Widow*. And I noticed that he

and I laughed at different things. Within three months, I found that there was a guardedness between us that had not existed before. You see, at the Radiation Lab, I worked under Wheeler Loomis, who was deputy director at the time. It took me years to codify this, but I came to think of it as the short-range effect. That is, if you're working with someone closely, there'll be a mutual guardedness—not hostility, not distrust, but not loving cooperation. You suspect that the other guy's going to put something over on you. Lee thought that I was, and I was.

PRUD'HOMME: That you were putting something over on him?

NEWTON: Yes. Now, it is certainly true that Lee and Arnold Beckman had the short-range effect working. When I got the campaign started, I could not get those two together. The crucial time when I did get them together was when I found that Lee was spending a week at Laguna Beach. Arnold lived in Corona del Mar. And I got Arnold to get in his car and drive to a filling station near Laguna, where Lee joined us, and there we talked about getting the campaign started.

PRUD'HOMME: You had to get them off their territory, in a sense.

NEWTON: Something like that. I was just grabbing at any way. I wasn't aware of this thing between them; I had not codified it. Of course, in later years, I knew all about it. And when my successor, Russ Bintzer, went on, I said, "Your job is to get Lee and Arnold to talk." And he gave up on that. And when Bob [Robert F.] Bacher came on as provost [1962], I said, "Gee, if Lee trusts anybody, it's you. You've got to do it." And after a while, Bob said to me, "Gee, sometimes I think Lee doesn't even trust me." It's the short-range effect. But they had been bosom buddies up until the time Bob became provost. And then they were concerned with the same thing. So when I talk about Lee, you must remember that I am still revealing the short-range effect. When I criticize Lee, it's a biased criticism. But I do believe—there is evidence in floods—that Lee is a very, very private man. That he keeps people out. And with that, he has this marvelous ability to communicate, to talk. And people believe him to be, as he truly is, a warm man. He's

a warm, affectionate man. He and Doris were a good couple. But you really cannot reach to Lee's heart.

PRUD'HOMME: Do you suppose that's because of the nature of the job, which is such a public one?

NEWTON: No, he was always like that.

PRUD'HOMME: What do you think are his greatest strengths?

NEWTON: His honesty. Everybody knew he was honest. It was just wonderful to see him being honest and still handling a delicate thing. He would change the subject. He would not tell a lie, but he would evade—you know, if somebody pressed him unfairly. No, his honesty is, I think, his best feature. His intelligence. He's a terribly fast listener. He got me into the habit of moving fast through a subject. When I'm on other committees or boards, I get wistful about the old days when I could go in and go out in two minutes.

PRUD'HOMME: What about his weaknesses?

NEWTON: Well, he will not ask for money.

PRUD'HOMME: And he's one whose reputation, you see, is that of a fund-raiser, of a great builder of an institution.

NEWTON: Yes, right.

PRUD'HOMME: How do you think the institute changed with his administration, after Millikan?

NEWTON: The course of development was uniform, in general. This was happening all over the world. Caltech moved from being personally run, through being administratively run, to being what is now practically bureaucratically run—with faculty

committees. We old-timers deplore that. DuBridge was what I call faculty-minded. Millikan was trustee-minded. Well, no, I can't say that. Millikan was a great man and he was a great seer; he knew who were the brilliant men and he got them.

PRUD'HOMME: And he'd give them freedom to operate.

NEWTON: Yes, that was Rule #1. They knew that Millikan's mode was past at the end of World War II. As one of the people said to me, Millikan would take three days keeping a good graduate student out of the Army, saving him for science. But those three days we needed an organizer, and DuBridge was a famous administrator. The Radiation Lab was a tremendous achievement. He ran the Radiation Lab, as he did Caltech, by giving freedom to people. He didn't choose stars; he was not a chooser. But when a body of opinion coalesced that said, as Pauling and Beadle said, "We've got to have chemistry and biology working together and we've got to get a lot of money for it," he would say, "Yes, that's true, you've got to do that."

PRUD'HOMME: So he would recognize the truth of the matter.

NEWTON: Yes, he moved with the faculty. He moved toward groups, and now we are run by groups.

PRUD'HOMME: Did he have any problems with the faculty?

NEWTON: I think not. Well, in the fifties, with Linus Pauling and things like that. That was very bitter.

PRUD'HOMME: How did he react to Pauling?

NEWTON: I think that he didn't like Pauling's politics and didn't like Pauling's emotions. He didn't like a display of emotion. He would have been happy if Linus had said, "I've been given a whole institution of my own and I'm going to go run it." I think Lee would

have said, “Great.” He wouldn’t say, “You can’t do that to Caltech; I’m going to keep you here and keep my chemists.”

PRUD’HOMME: And what about Harold Brown [Caltech president 1969-1977]—the change between DuBridge and Brown?

NEWTON: The temperature of the campus got quite a bit chillier. I was with Brown down at Freshman Camp once. And Brown, who will answer any question with wit and real intelligence, manages to remove himself. I came around a corner and found Brown sitting in these canvas chairs, where the activity of the students and faculty were over here playing touch ball. Brown just happened to be over there. Another time, I was at a big cocktail party, and I ran into Harold there, and we started talking shoptalk. Colene, his wife, came up and we all said hello. She drifted away. She came in sight again a few minutes later, went away, and came back. She passed us for the third time, and leaned over to Harold and she said, “Mix!” [Laughter] He was holding on to me, to talk shop. And he was a delegator and an organizer, more explicitly. Lee was not an aggressive delegator and organizer. He accepted clusters of force. When we were at the Rad Lab, when one cluster warred against another, he just said, “Let’s both exist. We will have this group and this group.”

PRUD’HOMME: So he took it as it came, in a sense.

NEWTON: Yes, that’s right. Brown would appoint a commission for study.

PRUD’HOMME: I stopped you from telling your anecdotes.

NEWTON: U Nu, the prime minister of Burma, was picked up by a Caltech alumnus—an engineer consulting in Burma. And the prime minister thought it would be a good thing when he came to visit this country for him to visit Caltech. So it went up to DuBridge, and DuBridge passed it to me, and I said, OK, I’d fix it up. Well, it turns out that fixing up for a prime minister of a country is a deal. And it just used up about three months of my life. It was a terrible mess! His plane landed at Burbank, and there was a procession

of automobiles, twenty cars, and the policemen from, I think, five political entities—the City of Burbank, the City of Pasadena, the City of Glendale, the County of Los Angeles, the State of California, USA, CIA—and they all had to be accommodated at the Huntington Hotel. They were sitting in the aisles. U Nu had written a play, and I had found some guy in Hollywood to find some actors who would sit on stools and read the play. We had dinner at the Valley Hunt Club. A big deal. There was an Association of Motion Picture Producers PR guy. He said, “You’re doing this. How about visiting studios?” And I said, “That’s one thing we’re not going to do.” Well, you can imagine the end of this story. After we’d gone through this tremendous brouhaha of getting U Nu and his company from the airport into the hotel, and settled and ready to start, a message came down from U Nu: “The prime minister would like to see a studio.” But I swung the whole thing around, and within an hour he was on his way to the studios. And the head of PR for M-G-M was going to get him. I saw the outcome about three days later. There was a picture of U Nu and Cecil B. DeMille and two of the cast of a movie that DeMille was producing. The movie was *The Ten Commandments*. [Laughter] His private secretary was a guy named U Thant, who later turned out to be the secretary-general of the United Nations.

PRUD’HOMME: Do you have any stories about Freshman Camp?

NEWTON: Oh, yes! I think that the stories about Freshman Camp are better found in the files of *E&S*. Every year, a student will write a piece in *E&S* about Freshman Camp, and you get local color there. My story would be that during the years that I went to Freshman Camp, there was always an element, a majority, who would not stay at the camp quarters, because no drinking was permitted [in Boy Scout campsites]. So they’d stay in a nearby hotel and sit up at night and exchange stories, and then go back and be good fellows.

PRUD’HOMME: What function do you think it serves?

NEWTON: It introduces the students to other students. I quote one of the articles that I read, that I have just mentioned: The students who were willing to knock anything don't knock Freshman Camp much. A good time was had by all.

CHARLES NEWTON**SESSION 2****January 25, 1983****Begin Tape 2, Side 1**

PRUD'HOMME: Why don't you talk about being a teacher in the Humanities and Social Sciences Division. Did you have to develop special techniques to teach scientists the humanities? Did you find that they were receptive to the teaching community in the humanities?

NEWTON: When I started teaching, in '61, the entering Caltech students ranked higher than any other freshmen in the country in verbal aptitude on the college board tests, and in English. Once in a while, a girls' school would come out with a higher combined score, but year after year the Caltech students were there. So they were not only hot in science, they were hot in English.

PRUD'HOMME: Were they interested in English?

NEWTON: They were more interested in other things. So my job was to try to interest them—I guess every teacher has to do that. In my first year of full-time teaching—that was 1966—I found myself using the group-encounter method, the Carl Rogers thing. I'd been soaking then for seven years in that culture; I was a member of the board of Carl Rogers's institute in La Jolla. It just seemed inevitable, and it seemed to work. The technique, as you know, is that the so-called coordinator—group leader, me—would just sit there. And somebody would say, "Shall we ask Newton what we're going to do today." Another one would say, "Won't do you any good, he won't tell you." "Ask him anyway."

PRUD'HOMME: But you would give regular assignments.

NEWTON: Those were papers.

PRUD'HOMME: Was this threatening to the students?

NEWTON: For some reason they took it up quite easily. Within a week or so, they would just come in, settle down, and go. Often, I had palms wet with terror going into a class with nothing to put on them. But it worked. But within a couple of years, I had other problems to do with the students' writing. It was to find subjects that they would willingly write about. Unwilling compositions are pretty bad for everybody. So I tried different devices of timing and of presentation. And in '69, I hit on the thing that just blew the roof off. I told my students that instead of their last paper in the spring, they were to present a work of art, which would represent their reaction to the subject, to the book. And then I went to people I knew in the arts and took the students with me, and they would go through a studio at Scripps College, or visit a teacher of etching over here at PCC [Pasadena City College]. And they all took this on with some enthusiasm. When the presentations came, they really were spectacular.

PRUD'HOMME: What kinds of things did they like to read?

NEWTON: I made a study of it, which I wrote up in an article that ran in *College English*, the teachers' journal, titled, "Underground Man, Go Home!"³ What they liked to read was science fiction and fantasy. I began my first year of teaching by asking the students, "What do you think you should be assigned?" And they told me what they wanted.

PRUD'HOMME: A repeat of their high school survey courses?

NEWTON: Yes, because that's what they were familiar with. That was what they thought I wanted to hear. But it very soon became clear that their fun reading included an awful lot of fantasy and science fiction. And it took me a long time to figure it out—that what they read were stories of great struggles for great ends, exactly the same kind of reading that composed the great epics of all time.

PRUD'HOMME: Did they like the older classics, then?

³ Vol. 37, No. 4, December 1975, 337-344.

NEWTON: They didn't get any. I didn't give them. But the Greek Homeric legend is titanic struggles for power, and *Beowulf* is the same thing, and Shakespeare. And this is what they liked. What they liked was a heavy moral content—that is to say, the good guy either wins or loses, but it's a hell of a fight. And they wrote for me endlessly, after I opened up that vein. And such good words. One would say, "I am sick and tired of seeing people knocked down flat in the mud." Again and again, they told me that the literature of the period beginning—I dated it from 1864—

PRUD'HOMME: They didn't want any soul-searching?

NEWTON: No, they didn't want any descriptions of the vileness of humankind. If the soul-searching happened to be a poetic rumination about the beauty of the sky or of a woman, fine. But they didn't want examinations of vileness. And that's where our literature has been going since. I arbitrarily chose the date of Dostoyevsky's *Notes from the Underground*.

PRUD'HOMME: Hurray for them, as far as I'm concerned. I think this is wonderful.

NEWTON: Yes. Well, since then, that has been spreading. And now you see not only science fiction, which is the perfect stuff for those kids—like *Star Wars*, a great moral epic—but also lots of movies are coming out about good guys doing good. And the period of *Along the Waterfront*, and *The Man with the Golden Arm*, and all of those examinations of sordidness and grime, that period is being phased out.

PRUD'HOMME: Has there been typecasting of the typical Caltech student as a sort of a greasy grind?

NEWTON: That's the universal character of a science student. The song of Georgia Tech is "Engineers have hairy ears." We started talking about literature, but this other thing is a very dear hobbyhorse of mine—the science student as greasy grind. It summed up what a girl student of mine, Jill Evensizer, said in one of her themes. She said, "In high school, nobody was interested in things that I was interested in, and I was made to feel

that I was wrong. But here, everybody's interested in what I'm interested in, and it's great." When the science students, especially the extraordinary ones, are a minority of 2 percent in the general population, they are considered aberrant, and they consider themselves aberrant. But they are actually a very strong society of their own. And when they join that society, they feel like Jill Evensizer—they feel great. And, as I showed in the first survey I made at Caltech, they play harder, play longer, play more, and play more games, and do more things, and go into more activities, and do everything more than average college students.

PRUD'HOMME: Because their aptitudes are above average across the board, not just in science.

NEWTON: Yes, and they are in a society in which they can exercise all these things in a way that's compatible with the society. But you get a bright science student in general high school, and about all he can do is go home and practice on his oboe, because he's not like the kids out there playing soccer.

PRUD'HOMME: It must be a wonderful release for them to suddenly find some peer acceptance and find a group.

NEWTON: It is, and it takes place in a couple of ways. One is perfect content. They absorb themselves in their studies, which are hard enough, but not overwhelming. If they can get in, they can handle it. But there's the group of high verbal aptitude, extraordinarily high, or multiple talents. And these students are the revolutionaries. They're the ones who say, "This climate is dull, a grind, it's apathetic. Nothing is stirring." And what that means is, "You're not interested in what I'm interested in, therefore you're apathetic." These born radicals—innovators, if you like—are creative, but not necessarily scientifically creative. They chafe, and they say, "This is a bum society." One of the students wrote a letter to the *Tech*. He described some of the miseries of life at Caltech, how narrow and confining and mean it was. And he said, "What are we doing to them?" He's saying two things: (1) the [Caltech] environment is doing it, and it is therefore to blame, and (2), also it is wrong.

No, “engineers have hairy ears” is the opinion of the majority of the public. But that climate is changing. This same girl, who had that experience in high school, toward the end of that year made clear that she was aware of the two cultures that C. P. Snow wrote about, and that I had discovered independently before I even heard about the Matthew Arnold–Thomas Huxley debate of the 1880s. This girl was aware of this, and another student, Lewis Hashimoto, was too. They were both extraordinary students, good writers. So, I took the library at the Athenaeum and had them to dinner, and said, “You two have been writing about a thing that I think is very important.” And I showed them the C. P. Snow stuff. I told them, “You’re victims. Our society is being run by people whose training is metaphysical—derives ultimately from Plato, Socrates, goes through the 19th century British stream; the law is the controller of real life. And your morals and your rules of conduct are derived from humanistic criteria.” And I sawed at this for quite a while. Finally I said to Lewis, “What do you make of this?” And he put his finger in the air and waved it slowly around, and I said, “What does that mean?” He said, “Oh, it sounds kind of like two airplanes way far away from me, just flying around each other.” And shortly after that, Jill very embarrassedly said, “I’m sorry, but I have a date tonight. Can I go?” They weren’t interested.

PRUD’HOMME: How do you bridge the gap between the physical and the metaphysical?

NEWTON: I was thinking of bridging it by fighting it. I wanted to expose the fact that there was a conflict, and then I wanted the students to be aware that their culture had value and that they should stick to it. But since 1948, science has just seeped up through the woodwork, and I don’t think there’s any fight.

PRUD’HOMME: In fact, you might begin to get complaints from the metaphysical side saying the scientists are now the leaders. So it may be more that the pendulum has swung.

NEWTON: Yes. I think we might look at the two cultures dispassionately, from the outside.

Begin Tape 3, Side 1

PRUD'HOMME: Can we discuss the changes in the role of the humanities at Caltech?

NEWTON: In the academic year '74-'75, we were having an end-of-the-year faculty meeting of the Humanities and Social Sciences Division. They were going to discuss a candidate for one of the top chairs in English. And [J.] Kent Clark, who was head of English, asked me to come and tell them about the early days of the humanities compared with the present. And what I told them was prompted by what went on just before I was asked to talk. They had spent the full meeting discussing this top candidate. And most of the time was spent discussing whether he had enough acquaintance with semiotics. I said that that reflected an interest in scholarly research and sophistication of research. But in the oldest days, only one or two members of what was then called just the Humanities Division were doing active publication. The rest of them were teachers. At the same time, they were people of real influence in the Caltech community. The division chairman was Clinton Judy, and he was highly respected. The senior people on campus were delighted to be invited to book-reading sessions at his home. And his successor, Hallett Smith was enormously respected, and he was invited to go to physicists' parties—physicists were socially at the top. The humanities people were men of character and influence, and they were—all but one, I guess—good teachers. And they were respected by the students, too. Then, in 1972, Smith was replaced as division chair by [Robert A.] Huttenback. I believe that Huttenback spent a long time preparing Harold Brown to ask Smith to turn over the chairmanship. It's true that Smith had held it for a length of time that no other division chairman had held his chair. But Huttenback told a friend that when he learned that Brown came to work at seven-thirty, he, Huttenback, was there, too. Huttenback was a notorious and self-advertised politician. So Hallett was called in and Brown suggested, "Have you thought about retiring?" And Hallett said, no, frankly he hadn't. Brown said, "Well, think about it." And the story goes—this is not my story—Brown called him the next day and had him come in and said, "Well, Hallett, now we have to think about your successor." So Hallett learned that he was on the way out.

Huttenback took over, and he actually had politicked for it. He had somebody visit me and say, “Would you vote for Huttenback if he ran?” Huttenback, first of all, was strongly influenced by the social scientists. The leader of that group was Lance Davis, an economist. Besides Huttenback’s interest in the social sciences, he was a believer in publication. If you asked him about teaching, he would say it was very important, and that would be it. That’s what [Caltech president Marvin L. “Murph”] Goldberger does. If you say “teaching” to him, he will say, “very important,” and that’s the end of it. Huttenback believed in publication. And so, very soon after he came in, the best teacher in the whole English department—a guy named Bill Cozart—his appointment was not renewed, because he had not published a big book he was doing on Chaucer. It was such a big book that he hadn’t finished it. But he was a superb teacher. In this survey I made, I put them all on a scale. And Cozart was off the scale up here. And this other teacher, who shall be nameless, an advocate of publishing, was a vile teacher. Many students said this man should not be allowed to teach. But these were the publish-or-perish people, Huttenback and Davis. First of all, they dropped Cozart. Then they put up a terrible fight to drop Jenijoy [LaBelle]. But Jenijoy fought back and scared the pants off them and won.

PRUD’HOMME: How?

NEWTON: Well, she was a woman, for one thing. And the other thing, she was a fighter. She was not going to take it lying down. Bill just took it. She assembled all sorts of opinion. And, of course, she had a lot of people working for her—Kent Clark and Hallett Smith, among others. They called their friends in the profession and had them write letters to support her. But the thing that got them was that she said she was going to bring suit for discrimination against a woman. Those were evidences of the growth of research—publish or perish, rather than teaching—as examples. These old boys furnished an example. Harvey Eagleson, who was kind of a fop, was also the master of student housing. He would call a boy in and say, “You need a necktie. Go to William Taylor’s and get a black bow necktie,” and a student would do it. Harvey had done

something for those guys. In fact, he started a beer-and-cheese club. They'd come to his house and read books. That went over so well that that club exists today.

PRUD'HOMME: The humanizing of the faculty.

NEWTON: Yes. That meant something, just being human beings as examples, as well as being expert teachers. So this went on. And then, pretty soon, the division's name was changed from Humanities to Humanities and Social Sciences. Finally, when the Jenijoy fight was going on, Huttenback came up for renewal. By that time, Brown had said, "We're going to have five-year terms for chairmen." So Huttenback was ready for renewal. And Kent Clark wrote a strong letter saying he didn't think Huttenback should be renewed. But Brown did renew Huttenback, for another five-year term. And Hallett, since that time, has only come to the institute to pick up his mail. He is really a terribly disappointed guy. Fortunately, he's a senior scholar at the Huntington. Kent turned away from the institute. Whereas before, he would write musical comedies every few years, he stopped. I took a strong part in the faculty meeting where they were trying to cut down on the hours required of English. They had successively cut down the hours, and Davis and company wanted to cut them down still further. At that meeting, Davis asked how did we know that the students wanted English? And at that point, I reminded them of the statement of the chairman of the Academic Policies Committee. The statement was, "I'd find it easier to get my committee to add hours of English than to get them to cut it down." So it was a muscle action.

PRUD'HOMME: Has this continued?

NEWTON: I think so. I'm not qualified to say. I absented myself, too. I only go in to pick up my mail and use the Xerox. The young people, of course, I wouldn't know anyway.

PRUD'HOMME: Do you think there's room at an institution such as this for an expanding humanities department, to provide the students with alternatives?

NEWTON: No. Because I think that Caltech is reflecting, once again, the national trend. The slow emergence of science as a culture is obliterating the culture best exemplified by Matthew Arnold—the English public school and Oxford education, where it was important to know Latin, Greek, and the classics.

PRUD'HOMME: So the institute is not necessarily turning out well-rounded students?

NEWTON: No. It no longer echoes that. You used to hear that quite a lot. And in fact, it was heard so well that the high schools knew it. A student coming in would fill out his application: “The reason I’m coming to Caltech is because I know I’ll get a well-rounded education.” It was on the masthead. There were four things. A quarter of your whole class time goes to humanities—and that’s not humanities/social science, that’s humanities. That since has been squeezed to very little.

PRUD'HOMME: That’s interesting. Because, of course, Millikan believed that you should have classics to develop a moral certainty of what is correct—what is right and what is wrong. And he felt that scientists, especially, needed this.

NEWTON: Yes, that’s right, he did. [George Ellery] Hale said it, too, before Millikan. [Arthur Amos] Noyes before Millikan. In fact, Noyes was the one described as the unrecognized designer of the Caltech persona. He wrote the stuff that Hale laid the first stone for. Hale simply said, in 1908, “This is to be a great scientific school.” But Noyes, within a few years, had written out the specifications, and one of those was to teach the humanities. And morality, both simple morality and ethics, were high in Millikan’s regard and ever present in his mind. And that meant in everybody’s mind.

PRUD'HOMME: This brings us specifically to the attrition rate at Caltech. In every institution, all students—or perhaps we should say, after your former remarks, all the verbal students—think that there are more people leaving their institution than have ever left any other institution. But this is not so.

NEWTON: Right.

PRUD'HOMME: First of all, what is the attrition rate at Caltech compared to the national average?

NEWTON: It's less than the national rate, which is 60 percent. Caltech's four-year attrition rate is lower than the national rate. Caltech's four-year rate was 40 percent; the attrition among students at the end of five years or more was 30 percent.

PRUD'HOMME: The attrition rate of scientists and engineers is larger than that of other students, presumably because their studies are more difficult.

NEWTON: That's right. Everywhere, the attrition in the natural sciences is highest. And it's next in engineering, then in business and health and law, then clergy, the arts, teaching. So the attrition rate in social sciences is much less than the attrition rate in physical sciences. At Harvard, in one of the studies that were made, 85 percent of the students who declared an interest in science in their freshman year were gone by their senior year. At MIT, it was higher. It finally turned out that you cannot compare attrition rate among general college students with attrition in the sciences. You must compare Caltech with other science schools, or you must take the students in general universities that are studying science. You can only compare them within the field. You cannot compare one school with another.

And when you do that, when you look at the people who take up science, you find that the only group that's comparable to Caltech students is composed of the winners and runners-up in the National Merit Scholarship competitions. Their intelligence is just about the same as the Caltech intelligence. And in each group, the attrition rate is less than among science students at any other school—less than science students at Harvard, less than science students at Yale, less than science students at any major university. The attrition rate at Caltech, viewed in the proper framework, is less than the attrition rate in science and engineering at other schools. So we must view it as not fantastically high but as unusually low. And it's been that way for forty years.

PRUD'HOMME: And it's remained constant?

NEWTON: Yes, only a few percent variation, up and down. And oddly enough, the attrition rate at general universities has remained the same for about forty years. And this, in spite of these enormous crises and cataclysms we've been through.

PRUD'HOMME: The whole sixties movement?

NEWTON: Yes. All the new fashions, everything that seemed such a change, didn't affect the attrition rate.

PRUD'HOMME: On your paper on the attrition rate, you had some absolutely fascinating quotes from the students. There's one that goes, "It would be better to go to a school of less prestige and more teachers who aren't doing research. Their great interest is research, and teaching is very secondary to them. They don't have to waste good instructors on freshmen and sophomores. They trade on their good reputation. They know that students will keep coming here anyhow. . . . It is impersonal and lacking in school spirit." Do you think that's valid?

NEWTON: No. That series of quotes is from different schools, not just Caltech. And what I'm showing is that you'll hear complaints of exactly the same nature at Stanford University, at the University of Chicago, at Harvard. They're the same. And what I'm trying to prove is that the complaints come from a certain type of student and do not arise from the environment.

PRUD'HOMME: And these are the high-verbal-aptitude students.

NEWTON: Yes. Some of them were actually identified in one of those studies. In the sixties, thanks to Huttenback and a history teacher named Bob Woodbury, there arose quite a strong groundswell which advocated diversifying the type of student we admit. Get students with high verbal aptitude; get students who are interested in religion. Go out and seek a diversified student body, so that we won't be so drearily scientific. These two historians, at the same time, wanted a more diversified way of handling the students. Well, what with one thing and the other, they shook up the faculty. The faculty thought,

“Maybe we’re a bad school. Maybe we’re not doing enough to humanize our boys.”

And so there were a lot of movements. Huttenback sponsored and financed a tour by a group of students. And the students came back and said, “Sure enough, we ought to be doing things differently.”

What I’m trying to say is that these feelings within the faculty were prompted by a feeling of guilt that they weren’t doing the right thing by their boys, and [these feelings were] strengthened by these occasional movements that arose among the students to change the environment. And in the sixties, we got a lot closer to changing the environment.

PRUD’HOMME: Has much been done to the environment at Caltech to make social growth easier?

NEWTON: No. First of all, Caltech students are socially mature already. They’re more mature than the general population. They’re more able to accept variation. And they are independent. But even if they didn’t have this maturity, they wouldn’t be affected by what’s done to change the environment, because the student makes it himself.

PRUD’HOMME: The student is very self-contained.

NEWTON: Yes. He’s just an intensification of the general truth that each individual is himself and makes his own universe. Now, oddly enough, along with all this—the social activity and the diversification—Caltech has grown through the years so enormously that it’s really a very metropolitan place. And yet we still have the complaints.

PRUD’HOMME: How would you view the quality of the teaching?

NEWTON: Well, since I have a vested interest in exposing teachers, I would say it’s not as good as it ought to be.

PRUD’HOMME: A PhD doth not a teacher make.

NEWTON: No, it doesn't. I'd say teaching is better at Caltech, because the human quality is better just in general. Also, you can't make a teacher out of reluctant material.

Teachers really are born, and they improve by practice and attention and effort—just exactly like a violinist is born with a talent and then rehearses eight hours a day. It's work and it takes single-minded devotion. Teachers are born. The bad teachers, while they cannot really be made into good teachers, can be exposed and gotten rid of.

PRUD'HOMME: How do you deal with the problem, as there must be, of the undergraduates feeling that the graduate students get all the attention and the top professors?

NEWTON: That's out of my competence. I'm sure the divisions do things with varying success. The chemistry division claims that many years ago it set up a self-study activity. They canvassed their students. They had had for years an ombudsman, who would try to receive the students' feelings and make them heard. The physics people have been overhauling their curriculum and their teachers. Dave [David L.] Goodstein is a shining example of a good teacher who is encouraged to teach.

To answer your question, I'll answer it two ways. First of all is the answer I keep giving back, that the born revolutionaries will never be happy. The majority of the students will accept what's there. But with that, there is the student grapevine, which exists everywhere. And you know, bang, right away, who's a hot teacher.

I'll finish off by discussing my teaching. The art project—within two years, I was so bored by it that the students also were bored as hell. And also, the hippie movement washed over Caltech at this time. So it was the thing to do to absent yourself from class. There was one time when only one student showed up. And I was desperate. Also, they had me buffaloed. There were a couple of very strong revolutionaries; they really had me thinking I was doing something wrong. What I did—and this was current in the country—was to bow to the students. I said, "Well, if you don't like all of this discipline, what would you like to do?" I'd heard of somebody at MIT who'd say to his students, "I don't care how much you write, just write a thought that's important to you. And then, bring it to class and we'll send it around and we'll discuss these ideas." I was completely

acquiescent; I was cowed, and it just got worse. Now, I took all of this responsibility on myself. I felt scared even though I knew then that this was going on all over the country.

I have to interrupt with this story. I was teaching a class on making movies. This was an independent enterprise sponsored by Frank Capra. And there was a couple, a boy and girl, who would sit in the front row and lick each other's faces. They'd neck in the most outrageous way. Being cool and hip, I didn't pay any attention. The students knew what was going on, and they were completely lost to me. I was bringing in the professionals—movie producers—to talk to the students. One of the guys came in and I introduced him to the class, and he started talking. These two started necking. And he said, "Wait a minute. Am I the show or is this couple the show?" [Laughter] And they broke up, and the producer went on to give a very good talk.

So, something told me to turn around. And the next year, I had complete discipline. I wrote down an iron schedule—this is when the papers are due, and these are the names of the people who write them. Anything that's late is not acceptable. Attendance is important. And then I had a routine: Everybody had to discuss their own paper, and the class would have to discuss it, too. I had a black girl, by the way, who complained about me to the dean. She said I was exploiting her. This represents the times. The whole thing turned around. I had 100-percent attendance nearly all the time. Classes went great, and I kept that method for the next year. It may be that the times were ready to turn around; it may be that the method worked. I don't know, but that's the story.

That's about the end of my describable efforts at teaching. The survey that I administered showed that I was just a so-so teacher. They gave me top marks on a couple of things, like marking papers. Oh, I'll tell you about that.

When I was first made a teacher, I read other teachers' comments. At Caltech, the custom is for the teacher to mark papers and examinations and put them outside his office door. And they'd lie there until the students picked them all up.

PRUD'HOMME: So everybody can read everybody else's comments.

NEWTON: That's right. So I read them and found that the universal method of teacher's comment is using red ink and there'd be a few marginal notes like, "sp." for spelling, and then there'd be a few lines at the end—"good subject, but not enough concrete material." So I did that. Then I typed a response to the student, in which I discussed—I tried to make three levels; I didn't say I was doing it—the grammatical style and the stylistic style, and then I would discuss the subject of the paper. And then I would try and find out what that paper was saying about the student's soul, and I would try to work on that. I spent one summer—a student took a summer subject, and he chose the plays of Ionesco. And I had to read twenty-three plays by Ionesco. Oh, that really killed me. But I wrote this thing, and he blew his stack. He said he had never had so much attention paid to him and he'd learned a lot. And I had another student who wrote a paper that clearly showed he was disturbed. I thought possibly there was something nagging him about sexuality—I didn't know. But I lived with that paper for two weeks, and then I wrote about the person who seems to be talking in this paper. And I followed him, line for line. He later told a friend that he had gotten more good out of that than he had out of anything else that he could remember.

PRUD'HOMME: So they appreciated that.

NEWTON: That's right. They gave me top marks on that. They also gave me top marks on class attendance. But they marked me under the average on knowledge of subject. And this is because all the time I had been holding myself in. I had this concept of "education" as "lead out." The student is the star. Don't lay it on him. You know, during this art project thing, I was the personality man leading the orchestra, and they loved it. But the rest of the time, I retired and didn't show my knowledge of the subject. I'd say, "What do you think?"

PRUD'HOMME: A good teacher is part showman and actor.

NEWTON: I know that now. And I learned it in that way, exactly by reading my returns. I learned something, and it was hard. First thing I did is what all teachers do when they look at a survey that rates them—they throw it away, they don't want to think about it.

PRUD'HOMME: Would you like to go more into the film project with Frank Capra?

NEWTON: That's pretty simple. Capra got the notion that film was a great medium and a coming medium, and everybody ought to know how to operate it—and Caltech students certainly ought to know. He gave us \$25,000, and Hallett Smith delegated me to run the course. He knew that I'd had experience in film. So I bought half-a-dozen cameras and some other equipment, editing equipment, got a room set aside, and took applications. I had about thirty. Some years earlier, Hallett Smith had said he was going to copy Harvard. Harvard had a "dirty room," which is a studio fixed up so that anybody who likes to can come in and play with paint, or sculpt. Hallett wanted that here, and he put it up here. What happened was that students and secretaries, just people, wandered in, dabbled around, and wandered out. There was no control. And also, by the end of the year, there were only two or three secretaries going in. So I said, "We're not going to do that. We're going to have complete control. First of all, we have to put in at least one hour of coaching with a camera professional to learn how to operate the machine. Then, you're going to have to come to all the meetings and listen to the producers that I'm going to have coming to talk to you. And then you're going to have to produce something to show—a film—by Christmas."

A great idea. All the cameras were broken within a week. I told them *not* to take a camera in your hand unless the pro coach hands it to you. That's universal: "I will take a complex camera and right away start monkeying with the controls." So that went by the board. Then, by Christmas, these thirty people were no longer thirty people. There were maybe twenty. They dwindled until, at the end, there was one student who produced something reasonable on film. He and I agreed that film really uses up your life. It really does. It's a lot of work. And as in many other respects, the students have only so much time to spend on this stuff. If you gave grades for this, they'd spend a little more time. So, at the end, we had a show-and-tell session with Capra. And Capra was very courteous but clearly very disappointed. And so we had to cut it out.

PRUD'HOMME: You had some anecdotes you wanted to tell.

NEWTON: Yes. At lunch today, somebody said, at the [Athenaeum] round table, “Is DuBridge writing his own story?” And I started thinking about the difference between DuBridge and Millikan. I remembered what happened once when I was going to a faculty meeting, the annual June meeting. I was walking behind Ernest Swift, who I think is the oldest living teacher—he came to Caltech in 1918. I was walking behind him; he was walking with somebody else. I heard him say, “Doesn’t it feel strange to be going to a faculty meeting and knowing that you’re not going to be told what you’re going to do next year?”

PRUD’HOMME: It must have been very relieving.

NEWTON: Yes. And it very well points up Millikan’s method. Another story about Millikan is that he made up the budget on a stair landing at the end of the year when the money had already been spent. Now, that’s not true at all. But that’s the way people felt, and that’s sort of the way he carried on, he and his few advisors—William B. Munro and a couple of trustees. Millikan, when he retired, didn’t want to go. So he came back and would sit around on benches on the campus. I knew him fairly well; I’d been to his house for Sunday breakfasts. It was at his house at the University of Chicago that my wife’s parents were introduced to each other. So I did know him a little bit, and I talked to him. And I remember sitting on a bench with him. He was talking about something that DuBridge was supporting, a blanket salary increase for the faculty. It was something to which DuBridge lent himself. The device that he used was to say, “Whereas you worked nine months before, we will now say you are working eleven months, and so the pay for all of you will be raised proportionately.” And Millikan said to me, “That’s wrong. He shouldn’t have across-the-board increases. He should have selective increases. That’s the way you get rid of the weak ones.” And I remember that sentence clearly. He wasn’t angry, he simply was concerned. But it tells you how he ran the place. So these are two illustrations of the two different methods. Millikan ran the place and DuBridge accepted movements once they were under way.

At the end of the lunch, they asked me if I knew anything about whether or not DuBridge was writing. I said I didn’t think so. Then I started thinking, “What do I know

personally about DuBridge?” And I thought, “If I had answered that question, I would say I’ve known him for forty years. And I know two things about him personally: One, he’s incorruptibly honest—the most honest man I’ve ever known. And two, he likes to dance.” [Laughter] And that’s about all I knew about him personally.

Begin Tape 3, Side 2

NEWTON: A profane anecdote is one about my Model-A. For something like twenty-six years, I maintained a Model-A Ford touring car. It was made in 1928, and I had it restored to brand-new condition. And I used it all the time. So I got to be identified by it. And people liked it.

PRUD’HOMME: Do you still have it?

NEWTON: No, I sold it last year. I think part of the profane story should be the Hamburger & Martini Club. Well, two of the members of the H & M Club were George Beadle and Hallett Smith. And for some reason, we decided to go into Los Angeles for lunch. So we did, in the Model-A. We had a good lunch. And we were spinning back in our machine, and a convertible with a couple of pretty girls in it pulled up alongside. And they said something facetious to us. And Hallett answered them flirtatiously. And they answered again. And pretty soon, we were having a sprightly conversation, driving along. And while this was going on, a speed cop came up behind and pulled alongside the girls and was furious and said, “Get off the lane.” Then, he pulled over to us and said, “You’re going a lot too slow.” [Laughter] So we speeded up and went away.

There’s another story that tells about the difference in the way the campus looked and felt. When I came on, it was covered with weeds in spots. And there were paths through the weeds to different places, including to the student cafeteria. There were gasoline drums all over. The graduate house used oil tanks functionally to put tables on. And the tennis courts and other available places were used by the students to repair their automobiles. There was one student who had three old 1937 Pierce Arrow sedans. He would take parts from one and put them in the other. Yet he claimed he owned seven—I wasn’t able to tell from the carcasses that were scattered all over the campus. That was

an interest of the students right up to maybe 1960 or so. And then the automobiles gradually just disappeared and were no longer a culture object to the students—just as slide rules passed out of their lives.

The students had a custom of putting a Christmas tree on top of Throop Hall. Do you know about that?

PRUD'HOMME: No, I don't.

NEWTON: Well, every year, they would hoist a Christmas tree up to the top of Throop—Throop Hall ended in a dome, and on top of the dome was a little cupola, about four feet square and about five feet high. And on top of that, the students would mount this Christmas tree and rig it with lights and stabilize it so that the wind wouldn't blow it off. It was a very risky operation; just to climb the dome was kind of tricky. Year after year, the administration said, "Don't do it." And year after year, they'd do it. Nobody could catch them. Nobody could prevent them.

But one year I decided I was going to top the students. So I sent away for a meteorology balloon—this eight-foot thing. Then I designed three lightweight silk banners, on which I painted the words "Merry Christmas World." The idea was to tie the balloon to a stay and then the banners underneath the balloon, so that the balloon would go up way high. Well, the balloon came. I had my son lined up to pick the lock that got me onto the roof of Millikan Library. He said it was a cinch; you just use a paper clip. But when I opened the balloon—and I had little small balloons to hold the pennants up—I had ordered a helium flask to blow the balloon up. Then when I got the balloon, it said, "This has to be boiled for three minutes." So I then had to rely on a librarian in the cellar of Millikan, because that was the only place they had a hot ring to boil a balloon. Then I went up to the third floor where the helium flask had been delivered and discovered what they meant by "flask" was five feet tall, cast-iron. So then I had to start recruiting students. And I got about five or six of them. Then it was pointed out to me that I didn't have a valve on top of the thing. So I ran over to physics, and I got a physicist who said he knew how to open a helium flask, and he had a valve to put on it—every physicist has a flask and a valve. So, the balloon was boiled. Then a librarian was posted to keep

people out of the elevator during the lifting and the transporting. And the students heaved at the thing. We got it into the elevator and up to the top floor, and they lifted it, hand-by-hand, up the ladder in the last flight, and got it up there. Then we blew the balloon up and attached the pennants on and attached little balloons to hold the pennants out. And it went up there. And sure enough, it was twice as high as the highest tree the students had ever put up.

PRUD'HOMME: Another story.

NEWTON: In about 1952, I think the American Universities Field Service was begun, and the idea of that was to bring to the campus a series of scholar-journalists. They would have been PhDs trained in a certain country, and then would be stationed in that country, and then would come back. This was supported by the Crane Foundation. They'd go through a chain of member universities. And at each one, they would report what they found in Afghanistan or whatever their country was. But the technique was important. The founder believed that the penetration and transmission should be through social lines as well as through the standard journalistic ones. So, in the country of study, the scholar-journalist was given a big budget; he could entertain, and he was instructed to stay away from the capitals. And at the American universities, he was to be made socially available so that he could, over the dinner table and afterwards, talk. One of the first years, we had a very good correspondent from Southeast Asia. Ed Hutchings was selected as a host. Following the prescription, he had some representative guests. I was one of them, Nancy and I. And Harvey Eagleson was another. We had a sprightly dinner. The Hutchingses are sprightly people, and lots of good talk. After dinner, we all settled down in the living room. And the guest began warming up for his informal discussion of his specialty. But Harvey Eagleson had not been considered. Harvey was of the old culture, which is derived from the English; you don't talk to a man about his specialty. So he asked Ed to turn on the gramophone. Ed was not only was willing but happy to do so. And he was also happy to serve drinks. Before the evening was over, Harvey was teaching someone how to do the Cubanola and glide, and the visiting specialist was still on the sofa with his rolled-up map.

Here's a story. The California State Science Fair had been trying to get started here. The head docent over at the Los Angeles County Museum of Natural History was a woman named Gretchen Sibley. She came to us for help. I felt pretty warm about it, and I had a very good assistant. So we went to work on it. I said, "How would it be if we got some Nobel Prize winners to judge the thing." And they said they thought that would be good. Then they asked us if we could get some money from Norman Chandler, and Chandler said, "Yes, you can get some money from the *L.A. Times*." So the thing wound up with six Nobel Laureates and pretty good money from the *Times*. So they got under way—and I guess it's still rolling. But Caltech really did the high schools some good on that occasion.

This is a story. Henry Borsook, a biochemist, studied what's called betaine-glycocyanine therapy. And he said that it strengthened tissue of all kinds—nerve tissue, muscle tissue—so that in case of heart damage, if you went and took these betaine-glycocyanine supplements, your heart would rebuild itself. He tested that. He used his brother, a doctor, and a Pasadena doctor named Billig. And they tested it. The brother was an enthusiast. He gave it to his patients and said, "This is going to do you good." He gave it to his secretary and told her it would be sexually important to her. He was getting good results in no time at all. It really was exciting to people. The sponsor of this study was a big chemical company, and they were the most excited of all—to have a heart-disease remedy is kind of powerful. So they had to put a vice president on it. He went out to Palo Alto, planning to start up a plant. And he sent his publicity man down to talk to Borsook and me. The outcome of that was they decided to test it at a Navy medical station in Pensacola. The head of that was Captain Ashton Graybiel.

In the meantime, I had attended a lunch given by Ben Meyer [a Caltech trustee], the president of the Union Bank & Trust Company; he had become impressed by this supplement and had given it to his secretary, who was dying—the secretary was a man. And he came back to life. He was round-eyed about it, and so was Meyer. They had repeated cases like that.

So they were going to test it at the Naval station on forty-odd people. The chemical company's publicity man came and Henry asked me to go along. So the three of us went together to Pensacola and there we interviewed some of the people. One of

the people was a sixty-three-year-old Cherokee Indian. He had been a test subject there for a couple of weeks. At the end of the two weeks, he disappeared. When they found him, he was working on a road gang and shacked up with a handsome gal. He sat and talked to me, and he too was round-eyed. He said, "I've been given life." So we were all pretty revved up. I got to thinking about this, and I got scarer and scarer. So we agreed to meet on Sunday morning and talk about what our conclusions were. The new plant was ready to go, up in Palo Alto. What I did was draft a memo that said, "We will not make any public announcements until we have administered tests to one hundred people with placebos." They had not used placebos in any of the other tests.

At the meeting, the publicity agent had a big square bottle of Jack Daniel's—this is at ten o'clock Sunday morning. So we sat down and had a drink—Henry didn't drink his—and talked about it. And finally I said, "Captain Graybiel, the Navy isn't going to be hurt if this thing is a bust. And Henry, Caltech isn't going to be hurt if this thing doesn't go. But the company is going to be awfully mad if they do start and it turns out to be a bust. And you, Henry, are going to feel pretty bad in your scientific community. So what do you think of this?" By that time, Henry was absolutely shaky. So we signed this thing, no release. And sure enough, the thing didn't work out.

PRUD'HOMME: What was it?

NEWTON: Well, it couldn't be proved to work consistently. They did put some placebo tests on in Little Rock, and it was just like cures for the common cold—some people got better and some people didn't get better. So it disappeared.

But the most memorable thing about that, we agreed to go back by way of New Orleans. We stopped overnight in New Orleans and we decided to test the local culture. So we went down to the French Quarter. I found a place where they had good jazz. I could hear it through the open door and I said, "I'm going in here." And Henry, who was very conservative, wanted to look up where they were singing real plantation songs, real true Negro folk music. So he and the publicity man went on and I settled down with the back bar band. And between numbers, strippers would come out and walk back and forth. I was there a long time. Finally, I made friends with one of the strippers. We had

a very fine conversation, very businesslike, because I had spent the great years of burlesque in New York, at Minsky's Burlesque. I knew all the girls—not personally—knew their routines. And I had an idea for a routine that I wanted to describe to this lady. We talked professionally for all of these drinks. Then, finally, I found out that I didn't have any money left. She said, "That's all right, I'll buy these drinks and pay your bill, the unpaid part." So I took her name and address. After all that was done, I became aware of Henry outside, shifting from foot to foot. So we went on. When I got back, I sent the few dollars to this lady that I owed her. It was a happy conclusion to a pretty good trip.

PRUD'HOMME: What are you most proud of, that you've done here?

NEWTON: The thing that I'm most sad about, attrition. As I said, I think it's the most important thing I've done. I am now trying to get the new provost, Robbie [Rochus E.] Vogt, to accept it. If I can get honest evaluation of teaching installed at Caltech, I'll be happy. I am, naturally, proud of the development campaign. It was a textbook job, and it was completely successful. And I'm also proud that I was accepted by the faculty from the start. The administration was under a stigma at Caltech. But apparently we were accepted. Yes, I'm proud of that. I am equal, or seen as one.

PRUD'HOMME: That's wonderful. Because it could be very sticky here, I should think, if you weren't accepted.

NEWTON: Yes. I look at the ones who are not accepted, the administrative people who come to lunch but are not accepted, and they know it.