CHEMICAL HERITAGE FOUNDATION

WILLIAM F. LITTLE

Transcript of an Interview
Conducted by

Arthur Daemmrich and Arnold Thackray

at

Chapel Hill, North Carolina

on

5 January 2007

(With Subsequent Corrections and Additions)

Upon William F. Little's death, this interview has been designated as **Free Access**.

One may view, quote from, cite, or reproduce the oral history with the permission of CHF.

***Please note*:** Users citing this interview for purposes of publication are obliged under the terms of the Chemical Heritage Foundation Oral History Program to credit CHF using the format below:

> William F. Little, interview by Arthur Daemmrich and Arnold Thackray at Chapel Hill, North Carolina, 5 January 2007 (Philadelphia: Chemical Heritage Foundation, Oral History Transcript # 0351).

Chemical Heritage Foundation
Oral History Program
315 Chestnut Street
hiladelphia, Pennsylvania 19106

The Chemical Heritage Foundation (CHF) serves the community of the chemical and molecular sciences, and the wider public, by treasuring the past, educating the present, and inspiring the future. CHF maintains a world-class collection of materials that document the history and heritage of the chemical and molecular sciences, technologies, and industries; encourages research in CHF collections; and carries out a program of outreach and interpretation in order to advance an understanding of the role of the chemical and molecular sciences, technologies, and industries in shaping society.

WILLIAM F. LITTLE

1929 Born in Hickory, North Carolina on 11 November

Education

1950 B.S., Chemistry, Biology, Mathematics, Lenoir-Rhyne College
1952 M.S., Physical Chemistry, The University of North Carolina at Chapel Hill
1954 Ph.D., Organic Chemistry, The University of North Carolina at Chapel Hill

Professional Experience

Reed College
1955-1956 Instructor

The University of North Carolina at Chapel Hill
1956-1957 Instructor
1957-1961 Assistant Professor
1959-1961 Associate Dean, Graduate School for Research Administration
1961-1965 Associate Professor
1965-1970 Chairman, Department of Chemistry
1965-1977 Professor
1972-1973 Chairman, Division of the Natural Sciences
1973-1978 Vice Chancellor, Development and Public Service
1975 Initial Registered Agent, The Arts and Sciences Foundation
1975-1979 Vice President, The Arts and Sciences Foundation
1977-1996 University Distinguished Professor (retired)
1983 Acting Executive Director, The Arts and Sciences Foundation
1991-1992 Interim Provost and Vice Chancellor, Academic Affairs

The Research Triangle Foundation of North Carolina
1957-1958 Associate Director, Chemistry
1987-2002 Chairman of the Executive Committee of the Board
1990-present Corporate Secretary

Research Triangle Institute
1968-1977 Chairman of the Executive Committee of the Board

1998-2003	Chairman of the Executive Committee of the Board
	Triangle Universities Center for Advanced Studies, Inc.
1975-1982	Vice President
1982-1987	President
	The John Motley Morehead Foundation
1978-1989	Chairman, Central Selection Committee (Scholarships)
	The University of North Carolina (16-institution system)
1992-1996	Senior Vice President and Vice President, Academic Affairs

Honors

1951-1954	Morehead Scholarship, University of North Carolina
1970	Outstanding Alumnus Award, Lenoir-Rhyne College
1980	Thomas Jefferson Award, The University of North Carolina at Chapel Hill
1984	Doctor of Science Honorary Degree, Lenoir-Rhyne College
1987	Order of the Golden Fleece (honorary), The University of North Carolina at Chapel Hill
1988	Marcus E. Hobbs Distinguished Service Award, American Chemical Society, North Carolina Section
1990	Sam Ragan Award for Contributions to the Arts in North Carolina
1991	Faculty Service Award, The University of North Carolina at Chapel Hill Alumni Association
1996	Order of the Long Leaf Pine, North Carolina
2003	Medicinal Chemistry Building at Research Triangle Institute named W.F. Little Laboratories
2003	Last road in Research Triangle Park named Little Drive

ABSTRACT

William F. Little was born and grew up in Hickory, North Carolina, a small town in the western part of the state. His father had five children by his first wife and four by his second. Little, Senior, was a professor of languages and provost at Lenoir-Rhyne College until the economics of nine children forced him to go to work for a savings and loan, of which he eventually became CEO. William loved living in a small town, and he loved his early teachers. He had no chemistry classes in high school, as the school was too small, but he had physics and biology. In college he discovered chemistry. A brother, a sister, and two nephews also went into chemistry. He attended Lenoir-Rhyne College, majoring in mathematics, biology, and chemistry. He loved chemistry and wanted to stay a chemist rather than going to medical school.

During the Korean Conflict, James Morehead III established what was then the Morehead Scholarships. Because graduate students could be drafted Morehead gave his first eight awards to graduate students, one of whom was Little. Little entered the University of North Carolina at Chapel Hill as a student in physical chemistry, but after finishing his Master's degree, he switched to organic chemistry for his PhD, which he also received from the University of North Carolina. He paid for his own postdoc at University College London, where he was interested in aromatic nitration. While he was in London Reed University hired him to teach. After a year there, studying apocynol, he was wooed back to North Carolina.

During his first year on the faculty he was persuaded to join the Research Triangle Foundation, which was attempting to establish a large park for research entities. He spent summers and chemical society meetings recruiting companies to expand into the Triangle; he ended up with an extensive network of business and banking leaders in the state and was a very successful marketer. Because there was an intermingling of University interests with those of the Park, the University gave Little a new post as Vice Chancellor of Research Administration. After several years in that position Little became chairman of the chemistry department. In that position he brought in a large number of faculty and new students; he revised the curriculum; he got a new chemistry laboratory built; he overrode the University's policy of equal pay raises and established pay for merit. After five years there, he became head of the Research, Development, and Public Service Office, helping originate a university-wide capital funds drive that exceeded its goal.

Little's long career has included a number of board memberships and many awards; but this career has always remained entwined with the Research Triangle Park Foundation and its Selection Committee; with the University of North Carolina, both its administration and its chemistry department; with the leaders of North Carolina's government and business communities; with individual faculty members; and, to a much lesser extent, to the chemistry where it all began. As he is fond of saying, "whenever I was asked to do anything I would salute the quarterdeck" to serve the North Carolina he loved.

INTERVIEWERS

Arnold Thackray was president of the Chemical Heritage Foundation. He majored in the physical sciences before turning to the history of science, receiving a Ph.D. from Cambridge University in 1966. He has held appointments at Oxford, Cambridge, Harvard, the Institute for Advanced Study, the Center for Advanced Study in the Behavioral Sciences, and the Hebrew University of Jerusalem. In 1983 he received the Dexter Award from the American Chemical Society for outstanding contributions to the history of chemistry. He served on the faculty of the University of Pennsylvania for more than a quarter of a century. There, he was the founding chairman of the Department of History and Sociology of Science, where he is the Joseph Priestley Professor Emeritus.

Arthur Daemmrich is an assistant professor in Business, Government, and International Economy at Harvard Business School and a Senior Research Fellow at the Chemical Heritage Foundation. His research and teaching focus on business in regulated environments and international comparative analysis of risk and regulation. At HBS he also plays an active role in an interdisciplinary Healthcare Initiative, advancing scholarship and developing applied lessons for the business of creating and delivering health services and health-related technologies. Daemmrich was previously the director of the Center for Contemporary History and Policy at the Chemical Heritage Foundation. He earned a Ph.D. in Science and Technology Studies from Cornell University in 2002 and has held fellowships at the Social Science Research Council/Berlin Program for Advanced German and European Studies, the Kennedy School of Government at Harvard University, and the Chemical Heritage Foundation. He has published widely on pharmaceutical and chemical regulation, biotechnology business and policy, innovation, and history of science.

TABLE OF CONTENTS

INTERVIEWEE: **William F. Little**

INTERVIEWERS: **Arthur Daemmrich and Arnold Thackray**

LOCATION: **Chapel Hill, North Carolina**

DATE: **5 January 2007**

DAEMMRICH: Bill, tell us about where you were born and your early childhood.

LITTLE: I was born in Hickory, North Carolina, which is in the western part of the state, into a family that ultimately had nine children. My father outlived two wives and married a third, but the children were all from the first two marriages. There were five children from the first marriage and four from the second marriage. We grew up in a big family spanning a number of years. My father was in academia in the early part of his life. He taught at Lenoir-Rhyne College, and he held a position that today would be called provost. He taught Latin, Greek, French, German, Hebrew, and weather. [laughter] He was a jack-of-all-trades, specializing in languages and history.

Incidentally, he had a big collection of early history books written around the turn of the century. I still have many of those books. It's a lot of fun to read those because the way that history was presented then is so different from today. History reeked of prejudices, but, as you might imagine, those books are a lot of fun to read. And if they are dull, they are still a quick way to get a perspective of what was being talked about, whether it's the French Revolution and its aftermath or early British history.

When the family reached seven or eight kids, it was somewhat hard to subsist on a faculty member's salary so he went into the savings and loan business where he became CEO [chief executive officer]. He was a very successful businessman in that activity.

DAEMMRICH: What was the name of the savings and loan?

LITTLE: Initially it was Mutual Building & Loan Association, but later it became Fidelity Federal Savings & Loan. I grew up in a small town, which was very fun. One of the things that I appreciate about that time—which I don't think exists to the same extent today—is how you could fall in love with your teachers in public schools. They were so dedicated, and in particular, my math teachers and my English teachers were just unparalleled. They had a big influence on me that I still think about today. Of course, those were Depression or post-Depression years so schools didn't have much in the way of science, except for biology. I had some good biology program teaching, but no

chemistry or physics. They just weren't taught because they didn't have the personnel. To that end, I didn't have so much of an interest in chemistry in my public school days. That came later when I went to college.

I went to a local church-related liberal arts college called Lenoir-Rhyne College. Our home was practically on the campus so I was not a typical day student. I was almost a residential student, except I didn't go to a dormitory at night. [laughter] However, my mother died just about the time I started and there were three of us boys, so in a sense maybe it was a dormitory. [laughter] But at any rate, I was originally a premed student. I remember interviewing at Duke University as a potential medical student. They had a program where you could begin medical school and finish the fourth year of a baccalaureate degree in the process, and I applied to that. That interview was what brought to the forefront of my mind that I really didn't want to go into medicine. I realized that I wanted to go into chemistry or math.

DAEMMRICH: What happened during the interview to bring on this epiphany?

LITTLE: I'll tell you something—you might not want to put this in it. [laughter] I sat there with three people, and one of the medical doctors pulled out a pack of cigarettes and said, "Have a cigarette. We eat your cabbage so you ought to be using our products." [laughter] Of course, he was off-base because he didn't know that cabbages are grown up in the mountains not in the foothills, but I knew where tobacco was raised. I took his cigarette and we conducted the interview. Well, that's not what really turned me off. On the way home I just said, "You know, this is not what I want to do." Chemistry runs in my family, in a sense. I have an older brother who, during the Depression, got as far as a master's degree at North Carolina State University [N.C. State] and then went to work for Hercules Powder Company, as it was called then. During the war he worked on projects like how to create soaps that would form suds in salt water. The troops at Guadalcanal needed to take a bath. [laughter] Ordinarily, when you put soap in salt water, it becomes a rock. He worked on projects like that. I was always very close to him. I have a sister who majored in chemistry, and she taught chemistry in the public schools in Greenville, South Carolina. I have a nephew who worked for Glaxo[SmithKline plc.], which illustrates a point about the Research Triangle. Here's a guy from Hickory, North Carolina who otherwise would have had to leave the state after he got his Ph.D. but he was able to stay right here and work for Glaxo. He is still with Glaxo. Another nephew works for Merck [& Co., Inc.] out of Philadelphia. He got a bachelor's degree in our chemistry department. He won the Venable Medal, which is an outstanding award for a senior, and we got through all that without any of my colleagues knowing we were related, which was important. [laughter] He went to Harvard [University], and then went to work for Merck where he's a group leader of some sort. So there is a fair amount of chemistry in my family.

THACKRAY: You said your brother received a master's at N.C. State.

LITTLE: Yes.

THACKRAY: In that day, what was the differentiation of UNC [University of North Carolina at Chapel Hill] and N.C. State?

LITTLE: I should clarify that. He got his master's degree in chemical engineering; there is no engineering at Chapel Hill. At that time, there was not a master's in chemistry, just a baccalaureate. It was in the ag school, but since then they got their master's degree and their Ph.D. in chemistry. So I should have said "chemical engineering." As far as I was concerned, he was a chemist. [laughter]

THACKRAY: What did your other siblings go on to do?

LITTLE: My oldest brother was in the retail business for most of his life, and later became responsible for the building and grounds at a Lutheran theological seminary in Columbia, South Carolina. My oldest sister taught public schools, as did my second oldest sister, and my remaining sister. [laughter] They all taught in the public schools. Another older brother worked for a newspaper in North Augusta, South Carolina, which is right near the Savannah River plant. Then there is my third sister who taught school, and my first younger brother who worked in the savings and loan that my father ran. My youngest brother taught mathematics in Tallahassee, Florida. So the family is rooted in education both in public schools and otherwise.

THACKRAY: You were easily the most academic.

LITTLE: Yes. I went the farthest in terms of formal education.

THACKRAY: In Hickory when you were growing up, what was the racial and ethnic mixture of the town?

LITTLE: I would say that the community was probably 20 to 25 percent black. It was totally segregated. The school systems were separate. Water fountains were separate. The waiting rooms at the train station were separate. It was a typical southern segregated

community. Yet many of the personal relationships between whites and blacks were very close and cordial on an individual basis.

THACKRAY: Sounds like Philadelphia today.

LITTLE: You've got a point. I think that you would find that in most of the communities in the South integration has gone much further than it has in the rest of the country. I don't really perceive any problems in North Carolina in the public schools. Of course, you will have incidents, but race is often of little consequence. You're going to have ruffians on the streets at night sometimes, but it's not characterized by race. I think that a tremendous amount of progress has been made. When I first came to the university, as a graduate student, it was segregated. During my second year, the integration of the university began, and it was slow at first. But today, I think that probably it's far more integrated than a university in the Northeast. There are no real problems. Incidents will occur that will cause some people to take positions based on ethnic lines. Take the recent lacrosse episode at Duke University. [laughter] That caused a great deal of division among students and others based on race. But if there hadn't been a racial element in that lacrosse case, you wouldn't have seen it.

I'm very optimistic about what's happened in the Southeast. We have some great leadership from the black community in the Research Triangle Foundation [of North Carolina]. One of the most important institutions that seldom gets mentioned when you talk about the Research Triangle economic development is our North Carolina Community College and Technical Institutes Program. We've got fifty-eight such institutions scattered across North Carolina, and they are training people that previously were making furniture, or hosiery, or spinning cotton threads. Now they are working in the electronics industry, the biotechnology industry, and the technically based industries because these community colleges can retrain those workers to do that. The president of Durham Technical Community College, Phail Wynn, Jr., is someone I work with regularly on the board of the Triangle Foundation and the [Research] Triangle Institute, and for my money, he's absolutely the best person on both of those boards in terms of the ability to analyze, recognize, and articulate. We've done very well in making one community. And this Technical Institute is just first-class.

I should mention that when Luther [H.] Hodges was governor—he started this Research Triangle program, which we'll talk about later—one of the things he said was, "Look, if we're going to change the profile of opportunity in North Carolina, we've got to retrain our workers." He started the Technical Institutes Program with an institution up in Lincoln County, which is just short of the mountains, and that has grown into the second largest system in the country. There's a technical institute within fifteen miles of every resident of the state. That's a powerful thing when you are interested in recruiting industry, whether you're talking about health care or English as a second language, or Spanish as a second language. These technical institutes are doing a fantastic job and it is

part and parcel of what Luther Hodges visualized in the Research Triangle program. He didn't visualize the language problem so much, because that came later, as you well know. However, the institutes were there, and they were important for both training our own people to handle Spanish and helping the Latinos to deal with English.

DAEMMRICH: Let me take you back to the chemistry study through in your undergrad days. Can you remember some of your mentors? Did you get into the lab and do actual research as an undergrad?

LITTLE: In those days, no. We had one chemistry professor for the four-year program, and the facilities were not adequate in those days. [laughter] I first encountered research as part of the undergraduate curriculum when I taught at Reed College in 1955. Reed is in Portland, Oregon and it's an outstanding institution. My college chemistry was not all that great. I had two professors that were particularly inspiring. One was a math professor who taught me precision. When you did a mathematics problem you punctuated it—colons, semicolons, commas, periods. [laughter] Boy, he was a real stickler, but it was the best training I ever had. When I came down here to Chapel Hill, I was originally a math graduate student. I took differential equations—a summer course—under the toughest math professor in the course. I had all these people that had been at Chapel Hill for a while telling me, "Look, I know you come from a small school. [J.] Burt [Burton] Linker is a tough professor. Don't expect anything more than a C." Well hell, I made an A. [laughter] I felt very good about the background my college professor had built in me. Another inspiring teacher was my history professor. I didn't care for his subject so much at that time, but he gave me two words that I wouldn't trade for anything: "intellectual curiosity." That was worth more than any history that I learned from this professor, because it was a concept that took me a while to fully appreciate. And now, I really treasure what little bit I have, and I think that consciously, to some degree, has emanated from his use of that term, "intellectual curiosity." A great term.

THACKRAY: What made you decide to go to graduate school?

LITTLE: That interview from medical school. [laughter] I decided I didn't want to go into medicine. As a matter of fact, I then had a little bit of a phobia toward blood. I'd seen accidents that bothered me; I had to think long and hard, "Do I really want to get into this?" And I decided against it. There was also the pull of mathematics and chemistry. I actually met the requirements of three majors in college: math, chemistry, and biology. I enjoyed all three of them. I didn't want to get away from the laboratory, that's what it amounts to, even though I didn't know fully well what a laboratory was then. Of course, today laboratories are so different. [laughter]

DAEMMRICH: Tell us about the transition then from math to chemistry in grad school.

LITTLE: I came to graduate school in the summer and took a few courses in mathematics as a mathematics graduate student. During that summer, I realized that I really did miss the laboratory so I asked to transfer into chemistry, and my request was granted. By the fall I was a chemistry graduate student. I felt like I was coming home.

THACKRAY: Your father was paying for this initially, is that right?

LITTLE: Yes, initially. That's an interesting story. My father always said, "I'll buy you all the education you want," but when I started graduate school as a chemistry major I wound up getting a teaching assistantship and he said, "Well, you know, I believe you can be on your own now." And I went on my own. But then the following spring, with the encouragement of one of my chemistry professors, I applied for one of the brand new Morehead Scholarships.

THACKRAY: Is that a state scholarship?

LITTLE: No. John Motley Morehead [III] was a graduate of our chemistry department back in the 1890s. His father had a textile mill or cotton mill up in Spray, North Carolina, which is on the Virginia border. He built a dam to generate power, but the dam generated far more power than the textile company needed. Morehead, being fresh out of the university with a chemistry degree, knew quite well that you could not make aluminum by heating bauxite with carbon the way you smelt iron. The electric furnace had just been developed in France, achieving temperatures far beyond what you could get with a regular furnace, and so he figured that they just hadn't heated the bauxite hot enough. So he stoked up his electric furnace with bauxite and carbon, but he still didn't get anywhere. Then he went down to his old professor, [Francis P.] Venable, and told him what he was trying to do. Venable said, "Well, why don't you throw some limestone in there. Maybe you can reduce the calcium, and then the calcium might reduce the aluminum." He stoked up the furnace with a mix of bauxite and limestone, but all he got was a slag-like material. So they set the material to the side, and somehow it got wet—there are various stories about how it got wet, whether it was rain or some other way—and when it got wet it gave off a gas and burst into flame. [laughter]

This was the beginning of the discovery of calcium carbide. He brought some of this slag down to Venable in the chemistry department and said, "This gas catches on fire when it gets wet." Venable had another student by the name of William Rand Kenan, Jr., the origin of the Kenan professorship. Billy Kenan was given the problem of identifying

the gas. Kenan came back a little bit later and said, "That gas is acetylene." This was the beginning of Union Carbide Corporation.

Morehead got the patent, and Kenan got a job working for Morehead. Later, he went to work for Standard Oil and had a successful career there. He then left Rockefeller and went to work for Henry [M.] Flagler, who developed the east coast of Florida and the Florida railroads. William Kenan was the construction engineer for the railroads. They set up hotels like the Coconut Grove, and they'd bring tourists down from New York in the wintertime and carry oranges back on those railroads. At the same time they had the big hotel business. That was a very successful venture with Henry Flagler. Flagler is a big name in Florida. Later Kenan's sister married Henry Flagler, outlived him, got his estate, and then married the newspaper baron in Kentucky, Louisville. His name was Bingham. She outlived him, too. She by then had accumulated two estates. Mary Lily Kenan-Flagler-Bingham. In reality, William Rand Kenan's biggest fortune came from his sister's estate. However, it was still connected with the Carbide story.

Morehead loved the university. He had no children. He was ambassador to Sweden under Herbert Hoover, and at that time he was also the single largest stockholder in Union Carbide. While he was in Sweden somebody offered him a Zeiss planetarium for cheap. He bought it, put it in storage, and in the mid-1940s he gave it to the University. They built a beautiful building around it, which is now the entertainment center for special dinners. Later he established the Morehead merit scholarship program, which is one of the most lucrative scholarship programs in the country. The scholarship program is based totally on merit, with an elaborate interview system with subcommittees scattered across North Carolina and outside of North Carolina at selected prep schools, and then a final selection here in Chapel Hill. They award about fifty to sixty fully paid four-year scholarships with a summer enrichment program where the student might work in a police department one summer, and another summer they might work in business or in a government office. They have a lot of different options. There was also the opportunity to attend the Outward Bound program. It's a beautiful program. I was in the first class in the spring of 1951. This was during the Korean Conflict. At the time, graduate students were getting exemptions and undergraduates were being drafted. They wanted to get the program started before Morehead died, so they started it on the graduate level. There were eight of us in that first class. That really saw me through graduate school.

THACKRAY: You must have been doing pretty well to be selected into that.

LITTLE: Yes. I was extremely lucky to have gotten that scholarship. Later, I served for twenty years on the Central Selection Committee, and chaired it for about half that time. It's been a big part of my life. I also got to know Mr. Morehead. He was quite a character—a very formal fellow. [laughter] He had a very cultured style of speech. He was mayor of Rye, New York for a long time. The program was patterned after the

Rhodes Scholarship program. In those days it was only men, and they couldn't be married. It followed all of the rules that the Rhodes program had. Over time that changed and it became gender neutral. I don't know if the rules regarding marriage have changed. It used to be that if a student got married, they lost their scholarship. I don't know whether that still exists.

At any rate, the whole program was a great experience for me. The greatest value of it though was not the money, it was the obligation it created in me to live up to what that scholarship meant. Through my whole career I've never forgotten that scholarship. There have been times when I've had to pause and say, "Now, wait a minute. You were a Morehead Scholar. Make the right decision." That has had a very powerful influence on me. In the process of being a scholar and being on the Selection Committee I became acquainted with a lot of the business leaders in North Carolina who served on the Board, on the Selection Committee, on the Board of the Foundation, or in any other way had a relationship to that program. My involvement with the scholarship program gave me, as an academic, an unusual association and intimacy with the business leaders of North Carolina. I know virtually all the bankers personally and have a good personal relationship with many of the manufacturers and other leaders of the state. I feel like I've had a very unusual opportunity that most of my colleagues on the faculty have not had.

Also, in 1972 Chancellor [Nelson] Ferebee Taylor asked me to join his administration as a vice chancellor responsible for research administration, development, and public service. I always saluted the quarterdeck if I was asked to do anything. Not that I had any particular skills in those areas but I took it, and that gave me even more association with the leadership in North Carolina. I wouldn't trade anything for these experiences because they gave me, as a faculty member, a personal relationship with the leaders of the state. I've had some recent illness from surgery and a former head of one of the major power companies came to visit me at home. He brought me a copy of Friedman's book on a disk. That touches you.

DAEMMRICH: We noticed you started in physical chemistry and then moved to organic.

LITTLE: I chose physical chemistry because of my interest in mathematics, but I did not find research in physical chemistry as exciting as working with real chemicals at the lab bench. [laughter] When I finished my masters—in those days you got the masters first and then went on to the Ph.D.—I changed to organic. I don't regret that.

DAEMMRICH: Part of that change was finding a Ph.D. advisor. Who did you work with in this?

LITTLE: I worked with Arthur Roe. Arthur Roe was an aromatic fluorine chemist. I worked on making some fluorine heterocycles, particularly of phenothiazines. In those days those compounds were exciting because chlorpromazine—a chloro derivative—was rather new as a treatment for certain mental illnesses. Also, phenothiazines were very important in oil lubricants as an antioxidant. The old notion was, "How can fluorine affect some of these properties as it does in steroids?" There are many fluorosteroids—you're probably aware of that—where fluorine makes a big difference. In the case of fluorophenothiazines, they didn't show any particular enhanced activity but the process of getting there was interesting.

THACKRAY: You enjoyed the work, but were you passionate about the chemistry and the research?

LITTLE: Oh, yes. I worked eighteen-hour days, seven days a week. [laughter] I tried not to work on Sunday mornings. Our department chair, Ralph Bost, was a Lutheran like me, and he was a real stickler. He didn't really want us working in the labs on Sunday. I'll never forget when he was ill—he got a fungal infection in his lungs and it ultimately took his life—I went to visit him one Sunday afternoon. I stopped by the lab first to change a desiccant in a desiccator and to dry something with some acetone. I did that. Then I went to his house, sat down, and started talking to him. I looked down at some point and saw that a big chunk of my trousers leg was dissolved away. [laughter] It was acetate rayon, and I had spilled some acetone on it. When I looked at that, I was horrified. [laughter] At any rate, I enjoyed my lab work, and I worked around the clock pretty much.

THACKRAY: At that time, how did people in the chemistry department view themselves in relation to the competition in the big world? You were, after all, still somewhat in the Old South.

LITTLE: Yes. We were in the Old South, but a lot of other things were quite different in those days. For example, in those days there probably weren't more than forty or fifty Ph.D. programs in chemistry in the whole country. The overriding thought though was, "If you're going to get a Ph.D. in chemistry, and if you're going to work in industry, you're going to have to go to the Northeast." There was a little bit of activity in North Carolina at the tobacco companies. American Enka [Company] had a rayon plant up in the mountains west of Asheville for making tire cords, and they did a little bit of research. However, on the whole, there wasn't much research in chemistry in North Carolina, or the Southeast. I was pretty certain I wanted to go into academics. But, at the same time, in my terminal year of graduate work I thought I ought to take a look at industry. In those days, recruiting a Ph.D. chemist was very difficult because there just weren't that many being produced, unlike what happened later in the 1960s when every institution in

the country set up a Ph.D. program. I would talk with recruiters and I'd say, "Look. I know I'm going into academics. However, if you want me to visit I'll be happy to come. You just need to know up front what my intentions are." They were very happy and they'd say, "That's fine because if you go into teaching we would be interested in your students." I took about six or eight trips, which was a standard number.

THACKRAY: Where did you visit?

LITTLE: Union Carbide, Proctor & Gamble [Company], Rohm & Haas [Company]. I went to [E. I.] DuPont [de Nemours and Company], of course.

DAEMMRICH: Did you go up to Midland to Dow [Chemical Company]?

LITTLE: No. I didn't go to Midland until I was recruiting for the Research Triangle. I realized if I was going into industry there was no place in North Carolina. Of course, that had a later impact on my interests. Those trips to the various companies were sufficiently interesting to me that I said, "I better go take a postdoc and think this over." [laughter] So I applied for a postdoc at University College in London. It must have been in the spring or summer of my last year. I had no opportunity to apply for a fellowship. NSF [National Science Foundation] was just starting some, but I had missed all the deadlines. So I took all the money I had saved by having a Morehead Scholarship and paid my own way to University College. I spent a year there. It was probably the most influential year of my life because it gave me a chance to get away from the Southeast and see how different the world was. Just before I got there in the fall of 1954 rationing went off. That was ten years after World War II. London was still strewn with rubble from the war. My colleagues in the laboratory all looked malnourished.

THACKRAY: Obesity wasn't a problem then?

LITTLE: Not a problem. [laughter] They did love to load up their tea with sugar. That was a reaction to the absence of sugar during the war. I developed a great respect for the English people. I used to joke that the national sport was not cricket. It was queuing, and that on Sunday afternoons they'd queue around the fireplace just for the fun of it. [laughter] They were such orderly people. I don't know that that is inherent in the British psyche because if you read British history nothing suggests that, but the experience of World War II required it. They adapted to it, they learned it, and they practiced it. I'll tell you something else, it had a very profound effect on me. Growing up in a southern community I had quite a vocabulary, and I'm talking about four-letter words. I got to England, and I learned pretty quickly that you don't do that. [laughter] It

cleaned up my language. To this day I'm very careful about using four-letter words, very circumspect about where and what kind of occasion will allow me to do that. I attribute that to my year in London with some wonderful friends.

DAEMMRICH: When did you take your postdoc?

LITTLE: Fall of 1954, spring of 1955. Academic year.

DAEMMRICH: How many of the people you finished grad school with took postdocs as opposed to starting their careers right away?

LITTLE: Not many. It wasn't very common. In those days most of the postdocs in this country were people who came from other countries to get experience in the U.S. laboratories. Some of my colleagues took postdocs but not many. That changed drastically only three or four years later when it became the ticket into academia.

THACKRAY: When the NSF began putting money into it?

LITTLE: Yes. The growth of research grants began following World War II. The National Science Foundation created a pool of money that faculty members could use to employ postdocs. All of that was the aftermath of World War II, when it was recognized that research is a very important factor in the economy of the country. That was learned during World War II when things like the Manhattan Project were underway.

THACKRAY: Since you were paying for your postdoc year, why didn't you think of attending [University of California,] Berkeley or Harvard? Why London?

LITTLE: First of all, I wanted the overseas experience. Secondly, I was very impressed with the work of [Christopher K.] Ingold and [Edward] Hughes, particularly on aromatic nitration. Thirdly, I had a professor, Joe [Joseph F.] Bunnett, who later went to Brown University and now is retired from [University of] California, Santa Cruz, and had been in the University College laboratory. He talked to me a lot about it.

THACKRAY: Were the people doing their postdoc at UCL [University College London] mainly English, or were they mainly overseas?

LITTLE: One was taking a sabbatical from Johns Hopkins [University] and the other was taking a sabbatical from Kenyon College in Gambier, Ohio. They were the two U.S. postdocs. There was another fellow who was on sabbatical from Haifa in Israel. He became a real good friend. I'm just trying to think who else was there as a postdoc. The other postdocs were all on sabbatical from another educational institution. A postdoc straight from graduate school was not all that common in those days. But it wasn't long before it became very common.

THACKRAY: Were you single during this time?

LITTLE: Yes. After that year in England, I taught a year at Reed College and then was invited back to the faculty at Chapel Hill. A couple years later I met my wife [Dell Hoyle Little], who was working for the news bureau at the University.

THACKRAY: That was comparatively unusual, wasn't it? People were getting married much younger in that era.

LITTLE: Yes, they were. I was married around the age of twenty-eight, which was a little late, but I considered marriage incompatible with graduate work and postdocing. Economically, it wasn't feasible.

THACKRAY: That's another kind of great shift in reality?

LITTLE: As you know, more and more people who do graduate work—and this means prospective faculty members—have gotten married during graduate work, frequently to another chemist or another person with a Ph.D. so that if you're going to hire a person, whether it be the man or the woman, you've got to find two jobs.

Did you know that even before that became common one of the selling points that we made in selling the Research Triangle was, "We've got three universities and some colleges in the area and we've got opportunities for spousal employment." We didn't use that word. We said, "Your wife's employment" in those days. [laughter] But it was a selling point that there were opportunities for a couple in chemistry or physics or whatever it might be with these universities and what we expect to have in the park. That was a very forward-thinking argument because the notion of gender equality was not yet a big issue.

DAEMMRICH: Did you apply to Reed College or did they come to you?

LITTLE: They came to me.

DAEMMRICH: While you were in London?

LITTLE: Yes. The reason that they came to me was that my former professor, Joe Bunnett, whom I mentioned, had taught at Reed and he had recommended me to Arthur [F.] Scott, who was chair of the department. When I was hired at Reed College there were two of us who jointly taught the freshmen chemistry. My colleague was John [E. H.] Hancock, a British man. John Hancock came from a postdoc at Yale [University], and I came from a postdoc in London. When we met our class, we were Bill Little from London and John Hancock from Yale, and the accents were so incongruent that it took a long time for the class to figure us out. [laughter] It was a lot of fun.

DAEMMRICH: Reed is well known as a small liberal arts school, correct?

LITTLE: Absolutely. It's one of the finest in the country. At that time their graduates had the highest percentage of Rhodes Scholarships of any institution in the country. They also had the highest percentage of their graduates going on to graduate and professional school. They had research as a requirement for the undergraduate degree with a defense of their thesis. A fantastic institution. I wouldn't take anything for that year's experience. It, again, had a big impact on my performance as a faculty member.

THACKRAY: Were they expecting research from you?

LITTLE: Yes. I was interested in a compound called apocynol. It's a phenolic material with a side chain that's a byproduct of wood. It had some relevance to the Pacific Northwest. I was trying to find materials that would react with apocynol to form a water-soluble material. I was hoping I could break down lignin with whatever I learned. I didn't get very far with that. But then, when I came to Chapel Hill I got interested in ferrocene. It was newly discovered at the time. I had a lot of fun exploring ferrocene chemistry, which later led to an interest in transition metal organometallics, generally. Toward the end, before I got too much into administration, I was working with analogs of vitamin B_{12}, which is a cobalt surrounded by a ligand that will form carbon-to-cobalt bonds. It's the only metal-to-carbon bond that's found in nature, or it was then. Vitamin B_{12} is a square planar complex of cobalt, and I was building ligands that would force it out of coplanarity. The idea was to expose two coordination sites and then try to

polymerize olefins by getting them to coordinate here, coordinate here, join, and pop off. We had some success. We got some compounds up to C_{20} from C_2, but we never got a high polymer. Later, a colleague of mine built further on the idea with some quite different compounds and wound up with a process that would dimerize acrylic acid to a dicarboxylic acid, which was valuable in making nylons. DuPont licensed it but never really implemented it. My colleague made some great strides using totally different systems. I didn't mean to suggest that he was using my ideas. When I went back into administration, my colleague started some work that was similar to what I was doing and made it work.

DAEMMRICH: At the time you were doing this work, metals in biology was just beginning to grow into a field of its own. There was a bit of a dispute at the time between [Linus C.] Pauling and people up in Copenhagen around the Ligand Field Theory. Did that play out at all in your work, or were you more applied?

LITTLE: We were much more applied. I don't know that any of that really affected how people did organometallic chemistry. Maybe it affected how they explained it, but I don't know that it led to any laboratory practices.

Pauling had so many interests. [laughter] I was at Stanford [University] on a leave of absence after I'd been department chair. Linus Pauling was at Stanford and was doing his vitamin C work. There were two things I remember from that. One of them was going into a drug store and seeing a letter from Pauling posted on a bulletin board, which he wrote to all the Bay Area drug stores, saying, "You better stock up on vitamin C. My book's coming out and there'll be a run on it." [laughter] The other anecdote I remember was that he ordered some vitamin C and the supplier misplaced the decimal by maybe three places, and he wound up with a room full of vitamin C for one hundred and fifty dollars. [laughter]

THACKRAY: Who recruited you back to UNC?

LITTLE: My thesis director, Arthur Roe, who was chairman of the department at that time.

THACKRAY: Was the department expanding?

LITTLE: No, there had been an organic chemist who had resigned so there was an opening. At that time, I was considering an offer from another institution. I sought the

advice of my former mentor, and he wrote back and said, "Before you do anything, would you consider coming back here?" I think I wired him, "Yes." [laughter]

THACKRAY: Why were you even considering leaving Reed?

LITTLE: The attractiveness of Chapel Hill. I wouldn't have gone anywhere else. I mentioned that there were two of us who taught freshman chemistry. One of us was replacing a faculty member who had resigned, and the other was a Ford Foundation teaching intern. Now, neither of us ever knew who was which. [laughter] But it was clear that at some point during that spring there was going to have to be a decision made. I wasn't worried about that decision because I wanted to go back to North Carolina. As much as I loved the Pacific Northwest, the weather was too much like that of London, wet and damp, with the advantage that in those days you didn't come home with your collar black. Now, of course, London's done a magnificent job of cleaning up, but in those days they still had the family hearth burning soft coal, and if you went to a small community at night it was just laden. Portland was very clean, but at the same time I'm a little bit of a sun worshiper. Temperature-wise Portland and North Carolina are about the same. Precipitation-wise they're about the same. It's the distribution over time that's different. [laughter]

THACKRAY: When did you come back?

LITTLE: I came back in the fall of 1956.

THACKRAY: So you were perfectly positioned for Sputnik? [laughter]

LITTLE: You got it. When the Research Triangle started there was already a scarcity of Ph.D.'s. When Sputnik went up that exacerbated the situation. The Feds started all these new fellowship programs—NSF, National Defense Education Act, NIH [National Institutes of Health]—to try to build up more graduate work in the sciences. That was when there was this vast expansion of graduate programs in the late 1960s. Fortunately, for two reasons, the Research Triangle started when it did. One, Ph.D.'s were still scarce, so I could write the director of research of Allied Chemical [Corporation] and say, "I'll be in New York the second week in July. Could I have a few minutes to tell you about something we're doing here in North Carolina?" Signed, "Little, Assistant Professor of Chemistry." And the response I got was, "Sure, let's go to lunch." The other thing was that home air-conditioning became feasible.

THACKRAY: When did that come in?

LITTLE: In the 1950s. If we had had to offer the people we were recruiting to work in the Research Triangle to our beastly summers without air conditioning it never would have worked.

THACKRAY: Go back to when you're a graduate student, what happened during those dog days in the lab? Were people in there getting hot and bothered? [laughter]

LITTLE: We just had to sweat it out. It was worse than that. In those days, state regulations would not allow screens on the windows of state buildings, and when you work with ammonia in a laboratory you attract all the flies in the county. [laughter] It was hell, but we survived it.

THACKRAY: Did Duke have screens? [laughter]

LITTLE: In those days, the Duke chemistry department was right near the Duke chapel and they had all this Gothic construction, and we used to say that, "Duke has the only chemistry building in the country that's fully equipped to ward off an archery attack." [laughter]

DAEMMRICH: So you went back to UNC, and it was a mix of teaching and research? When did you first find yourself in an administrative role?

LITTLE: The first thing that happened was in the fall semester of my first year, my chairman called me into his office and said, "Bill, do you know what the Research Triangle is?" I said, "Yeah. It's teaching, research, and—well, I can't think of the third one." [laughter] He said, "No. It's not that. There's an effort underway to try to promote this area for research laboratories. Professor George Simpson of the sociology department is heading up a committee that the governor has established, and that a Winston-Salem banker has funded to try to promote the area for research labs. They're looking for somebody to travel and visit the chemical industry. Would you be interested in doing that?" And I said, "You better believe it."

I was interested because I had faced the problem of finding no opportunities in North Carolina. I also felt that if we developed research laboratories in this area we could hold our heads a little bit higher. When I first began recruiting for industrial positions I'd sometimes ride to the interviews with a car pool, and somebody would say,

"What's it like down there in the sticks?" That really burned me, and I wanted to get even. So I had a lot of reasons for saying, "Hey, I'd love to see this happen. I can see what it would do for the university, the chemistry department, for the young people of North Carolina. I'm not interested, myself, in going into industry, but I'd sure like to help change things." And so I agreed to travel.

THACKRAY: Was part of the incentive that you got time off from teaching? Or did you get additional remuneration?

LITTLE: No. It was a multi-pronged program. First, I would collar all the industrial recruiters who came on campus to interview for Ph.D.'s and tell them about what we were trying to do, and then later I would give them brochures, when we had them, to carry back. It was a promotional effort. Secondly, I'd travel during the summertime to visit companies, which I was paid a stipend for doing. Thirdly, the Triangle would send me to any national meeting of the American Chemical Society, and I'd visit companies while I was there, whether it be New York or Cleveland. Miami didn't offer many opportunities, but while at those meetings I would also talk with chemists I knew that were in industry. We would always have UNC alumni luncheons, which would have a collection of people from a lot of companies. And I would tell them what we were trying to do and they'd say, "If it works, let us know because we'd like to come back to North Carolina." Almost without exception people wanted to come back.

DAEMMRICH: Tell us the pitch you were making at the time.

LITTLE: I would say, "We have a great location. We're on the access from Atlanta to Richmond, to Washington, to Boston, to Baltimore. We have two rail lines." We didn't even mention the airport that ran right past where we are. "We have a low cost of living." We had about a three or four-page brochure that showed the price of eggs here verses other places. [laughter] "We have clean air." At that time, the problems of the cities, smog and so on, were just being recognized. "We have air conditioning. [laughter] We have three universities that offer all kinds of cultural activities. We have a state art museum, a state symphony orchestra. We have all these cultural amenities, but we don't have the problems of the cities. It's a great climate, and we're two or three hours from the mountains and two or three hours from the coast."

THACKRAY: The other thing that you're playing right into is the baby boom and the suburbanization era.

LITTLE: Yes.

THACKRAY: But the pitch didn't exactly take off like wildfire?

LITTLE: Well, it didn't take off right away, but we did have a positive response. As a result of my visit to Atlas Chemical Industries, one of the spin-offs from DuPont, Walter Rugeberg, the director of research whom I met there, came to visit. During the first summer, Texaco [Company] came to visit. A fellow by the name of [John K.] McKinley came and visited. We didn't have a park then; we just showed him the area. We even got the Chamber of Commerce directors from Durham and Raleigh to behave like gentlemen towards each other, which was no mean an easy feat. [laughter] Arthur Scott, who was my department chair and probably my most important mentor—I loved that man—had a good friend by the name of Walter Kuhn. Walter Kuhn was from Portland, but he was also general manager for research at Texaco. When I went to the fall ACS [American Chemical Society] meeting in New York, I had dinner with Scotty and Walter Kuhn. I said, "Mr. Kuhn, you know John McKinley, don't you?" He said, "Yes. He works for me." [laughter] So I asked him, "Did you know that he visited our area this summer?" He said, "Yes, and you came in second." [laughter] So we had responses to those visits early on. If you look at it as a feasibility study, we were getting positive results.

DAEMMRICH: Well, in these visits you were telling people to come set up a lab?

LITTLE: We never asked anybody to move a laboratory. We said, "If you're going to expand and you're looking for other locations, we want to be on your list." It was that simple. Of course, in those days, research was trying to expand as long as they could get the people. And then we said, "We've got the people, and we have opportunities for spousal employment." We used a different term, as I mentioned earlier, but all that was part of the pitch.

THACKRAY: In recent years, a lot of corporations have been downsizing their research. Has that affected what's been happening here?

LITTLE: We had the best year we've ever had this past year. We have only 10 percent of our holdings left. We've doubled the price on the land and it hasn't slowed down the activity.

THACKRAY: Going back to the startup, we read that some of this actually came out of a social science vision. Did this stem from the Odum Institute for Research in Social Science?

LITTLE: You have to be careful about that. Odum's role has become a bit apocryphal. Odum was a very powerful and salutatory force of this university. When we were talking about what makes North Carolina different at lunch, I mentioned Frank [P.] Graham but I also should have mentioned Howard [W.] Odum. He was the head of the sociology department and the newly-formed Institute for Research in Social Science. He pushed for integration in the 1930s. He pushed for the industrialization of the South. In some places in our literature, we'll even give him credit for the idea of the Research Triangle. That, however, is wrong.

He envisioned a research program of some sort between UNC at Chapel Hill and North Carolina State focusing mostly on the sociology of the South, not the technical industrialization. Odum's biggest influence though was that George Simpson, the sociologist who headed the governor's committee and who I also worked for, was an Odum product.

THACKRAY: But he understood that Odum's was a natural science concept?

LITTLE: Absolutely. He was the first one to try to correct the allegation that Odum was the source of the idea of the Research Triangle. Odum had an idea, but it was quite a different idea. That myth needs to be dispelled. The real origin of the idea was an industrial contractor by the name of Romeo Guest, who was a graduate of MIT [Massachusetts Institute of Technology], whose business was building industrial plants principally in the textile industry.

Romeo Guest's operation was in Greensboro, to the west of here. But he was trained at MIT. He saw what happened along Route 128, and he thought the same thing could happen here. He even published a brochure, "North Carolina's Golden Research Triangle," promoting this area. He got in Governor Hodges' ear, and though Hodges at first was reluctant he was later won over and the program was started with the support of Robert [M.] Hanes of Wachovia Bank in Winston-Salem. Hanes headed up the governor's committee and was a powerful force in North Carolina. Romeo Guest coined the term "Research Triangle," but he also had a strictly business interest in doing that. He wanted to build plants.

THACKRAY: If we follow the money for a minute, it's a great American story because it's all about real estate speculation.

LITTLE: Originally, the land that is now the Research Triangle consisted of some purchases and options that a former New York textile executive, Robbins, secured. He had had a very successful business operation in North Carolina. There's a town named for him in North Carolina. He was induced by a friend of the governor's to make an investment in purchases and options of land that was to be called Pine Lands Incorporated. We were out promoting Pine Lands, a private venture.

THACKRAY: Wasn't there some state money in there?

LITTLE: No.

THACKRAY: Whose money was used?

LITTLE: Initially, it was Robbins' investment and a little bit of stock that was purchased by some local people. Robbins had promised a million dollars, gave about a half million, and invested about a half million. Before he invested the rest he wanted to see more participation in North Carolina.

THACKRAY: So, this was actually a business venture in the boondocks with someone from the big city?

LITTLE: That's exactly what it was. When Robbins was reluctant to put up the rest of his commitment, Robert Hanes, who was at that time ill with cancer, and Luther Hodges went to visit Archie [K.] Davis, Hanes' anointed successor at Wachovia Bank, down at the beach. They wanted Archie to go across the state selling stock in Pine Lands. Archie said, "Gentlemen, I cannot try to get people to buy stock in a company where our public universities are doing the selling to promote it. It isn't right. But I'll tell you what I can do. I believe that I can raise money as contributions to buy out Robbins' investment and make it a public service opportunity." The governor and Bob Hanes said, "Well, go to it." And in sixty days Archie raised 1.8 million dollars. Today that would be about eighteen million dollars. He did this almost single handedly. He did have a little help in some cities.

THACKRAY: This says something about the level of cohesion in the state business community.

LITTLE: The Triangle community has contributed only about 20 percent. Winston-Salem was the biggest contributor, and there were contributions from up in Canton, North Carolina, which is in the western end of the mountains, all the way down to Elizabeth City on the coast, and Wilmington.

THACKRAY: When was this?

LITTLE: Nineteen fifty-eight.

THACKRAY: Post-Sputnik.

LITTLE: Yes. But at that point Sputnik didn't have that much impact on raising this money because the general public didn't realize what the shortage of Ph.D. scientists was doing. In academia, we did.

THACKRAY: But you were hired earlier in 1956?

LITTLE: Yes.

THACKRAY: If I were on a conflict of interest committee today, I'd say, "Bill Little, you're in breach of regulation," isn't that correct?

LITTLE: I don't know that I'd be in breach of regulation but I'd probably be in breach of the spirit of regulation. I don't think there was anything that addressed this directly. But, yes, that's what Archer Davis was saying.

THACKRAY: And yet it worked? [laughter]

LITTLE: Yes. When I traveled in the summertime I was paid by the Foundation, or what is the forerunner of the Foundation, not by the university.

THACKRAY: What was that entity?

LITTLE: It was the Research Triangle Committee, Inc., which later changed its name to Research Triangle Foundation.

THACKRAY: So that was a nonprofit?

LITTLE: Yes. The nonprofit was promoting a private real estate venture. That's what Archie Davis had objections to. But he loved the universities. After he left Wachovia Bank, he came to Chapel Hill as a graduate student in history and completed a master's degree. He then worked toward a Ph.D. degree. We've got lots of ABDs, "all but dissertations," but Archie was an ABC. He didn't take all the coursework. He wrote, defended, and published two dissertations, but he never got his Ph.D. because he didn't take all the courses. He couldn't find a parking place. [laughter] He was quite a guy.

Some years later, in 1975, when the Foundation was getting out from under its development debt and mortgages, it set up something called the Triangle Universities Center for Advanced Studies, Incorporated, which is on about a hundred and twenty acres of beautiful land in the park. This was land that the universities could use for joint activities. This was set up in 1975. The [National] Humanities Center was then being promoted by the American Academy of Arts and Sciences, bids were being made by Stanford, Texas, you name it. We put in a bid, and our point was several-fold. First of all, Archie would raise a million and a half for the building, which he did in thirty days. The universities would provide, collectively, five years' operating expenses for the administration of the program. We gave the land, operating expenses for five years, and a million and a half toward the building. That became one of Archie's biggest interests for the remainder of his life. On that land, we have the Humanities Center, the North Carolina Biotechnology Center, the Microelectronics Center of North Carolina, the National Institutes of Statistical Sciences, [Statistical and Applied] Mathematical Sciences Institute, and the Burroughs Wellcome Fund.

THACKRAY: Does any of that connect to SAS [formerly Statistical Analysis Software]?

LITTLE: Not really. SAS is interested in the Statistics Institute, but, to my knowledge, they have not been a contributor.

THACKRAY: But it helps the critical mass?

LITTLE: Oh, absolutely. Statistics, historically, has been strong at Chapel Hill and N.C. State. We had a joint program back in the 1950s, one of the first mathematical statistics

programs in the country. Also, biostatistics has been very strong in our UNC at Chapel Hill School of Public Health. The Research Triangle Institute got started with a statistics and operations group. We have a very strong statistics program here and have had some real giants in the field.

THACKRAY: I have a daughter-in-law who is a Ph.D. in statistics from N.C. State.

LITTLE: She may have worked for Gertrude [M.] Cox, who was the real leader at State and who contributed half of her research program to start the Research Triangle Institute. She spent half her time at the Institute and then later became full-time at RTI. [Research Triangle Institute]. The Gertrude Cox Building is in her honor.

THACKRAY: If you look back, what were the first two or three clear successes?

LITTLE: The first major success—and this is a quick throw away—is the Research Triangle Institute. It was the first occupant of Research Triangle Park, and about a third of the money that Archie raised went to start the Institute, which was a powerful statement of what the founders of the Research Triangle believed.

THACKRAY: This was like Battelle [Memorial Institute] or SRI [International [formerly Stanford Research Institute]]?

LITTLE: Yes. It was probably modeled after SRI.

DAEMMRICH: So it did some contract research?

LITTLE: Yes. About 90 percent is federal work, but they do some industrial work as well. They also do work for state governments, particularly in the field of education, but they also have very strong programs in anti-drug research—illegal drugs, not pharmaceuticals.

The first major success was the Chemstrand Corporation. Chemstrand Corporation was in Decatur, Alabama. They were a joint venture of American Viscose [Corporation] and Monsanto [Company]. The very first person I talked to when I started work for the Research Triangle in January of 1957 was a fellow by the name of Bruce Ballentine, a Ph.D. graduate from our chemistry department who worked for Chemstrand in Alabama where a number of our other graduates were. We went to lunch, and I told

him what we were trying to do. He was very excited. He said, "Keep me posted." A year later, in January, he came back interviewing and by that time I had brochures. He said, "I'll take these back and show them to my boss," and he did. A month or so later we got a letter from his boss saying he wanted to come and take a look. So his boss, David [W.] Chaney, and one associate who had been director of research at Ford Motor Company came and spent two or three days. Then Chemstrand decided to buy about four hundred acres and built a big laboratory. It was the first major laboratory in the park.

Some years later Bruce Ballentine told me, while in a line at the grocery store in Chapel Hill, "Bill, I want to tell you a story. When you gave me those brochures on the Research Triangle we had already made a decision to go to Princeton [University]. It was going to go to the board in June. There was a man on our board by the name of Frank [J.] Soday. He's a polymer chemist and also an archaeologist or an anthropologist. He studied the American Indians in the Southwest, Alabama, and Mississippi. My boss knew that Frank Soday would likely ask the question, 'Did you look at that thing in North Carolina?' and my boss felt he had better be prepared to say yes. [laughter] They came to make a visit and they changed their recommendation." I would venture that without that decision, which was made in 1959 or 1960, the Triangle might not have worked because the land was mortgaged and there wasn't another major laboratory until IBM [Corporation] made its decision in 1965. I don't know that they had the resources to span that time without going to the state to get help. At no point was any state money invested in the Triangle effort, except for the following. When we got the National Institute of Environmental Health Sciences, we had to provide them with the land. In those days, if you got a federal lab you had to. The Triangle gave them four hundred acres. The state reimbursed the foundation for that gift. Terry Sanford also helped us meet our payroll and our other debts. He brought the corridor for I-40, through the park, way ahead of schedule for cash-flow purposes.

THACKRAY: What was the cash being spent on?

LITTLE: Staff for the foundation and mortgage.

THACKRAY: The staff did the promoting?

LITTLE: Yes. When Robbins gave up his land and his options, the money that Archie raised was not to buy that land or to buy those options. Robbins took unsecured notes. Allegedly, he was going to forgive those notes. We don't know, but I've heard that. The money that Archie raised was used to put infrastructure in. We had to bring in water from Durham. We had to hire a professional staff to promote the Triangle. We had to do all kinds of land planning, which was expensive. Robbins died unexpectedly about two years after the land had been transferred and his estate called in the notes. That meant

that Archie had to put together a consortium of about eight banks and insurance companies to provide a mortgage for the Foundation. The Foundation had mortgage payments to make.

THACKRAY: Using what as money? [laughter]

LITTLE: Exactly. But Chemstrand was very successful. They developed AstroTurf here. Then, many years ago, Monsanto bought out American Viscose and operated Chemstrand as a materials lab for a number of years before moving it to St. Louis to incorporate it into their central research.

THACKRAY: In that early period, who were the strongest supporters?

LITTLE: The standard answer to that question is that we had a lot of supporters. The central figure was Archie Davis because he raised the money, but it was Romeo Guest who came up with the idea and convinced the governor. Luther Hodges promoted it and started trade missions first to New York and then to Europe before any of the governors were doing that kind of thing. George Watts Hill in Durham, who was chairman of Central Carolina Bank, played some very important roles. George Simpson had the ability to get all these business people to work together. He was the glue.

THACKRAY: What fraction of those involved were North Carolina natives like you?

LITTLE: Almost all of them. It's not an accident that North Carolina, the third lowest per family income when this thing got started, still had the first state symphony orchestra, the first state art museum, and the first state university. Shortly after this started, the first residential school for the performing arts in Winston-Salem was founded, as well as the first state-supported science high school. That's not an accident.

THACKRAY: What's the explanation, if it is not accidental?

LITTLE: North Carolina is a curious mix. Joe [Joseph L.] Templeton told me something six months ago that I had never realized. He had just gotten back from a year with NSF, and he said, "North Carolina's very different than any other state I'm aware of because people identify with the county they come from. That's not true in Iowa where I grew up." I got to thinking about it, and it's true. I'm a Catawba County boy. [laughter] I've always considered myself a Catawba County boy. Those Burke County boys right

next door are ruffians, and in Alexander County they're all bootleggers and that's where auto racing started because they had these souped-up automobiles to carry the moonshine. Every county has got its own characteristics, and people identify with the county they're from. Mention was made of Lowry Caudill, who made three hundred and some million dollars off of his start-up company, Magellan Laboratories [Inc.]. He's a Cleveland County boy, down in Shelby, not far from where I grew up, who had an opportunity to come back to North Carolina and work for Glaxo [Research Institute] before starting up his own company. There are just dozens and dozens of similar situations where people went to N.C. State, and then went to Princeton for their Ph.D. but ended up coming back and working in the Triangle. It's interesting that counties are very prominent in the psyche of North Carolinians.

THACKRAY: Why do you think Chemstrand came here instead of Princeton? Was it because of having Ph.D.'s from UNC?

LITTLE: That must have been a factor; they must have put a lot of pressure on Dave Chaney, who was head of the lab. But at the same time, you can't make a decision that way in industry. There have to be other things that you tell your board. The cost of living must have been a consideration, as well as the climate, the ability to attract people to a non-metropolitan but culturally advantaged area, and the coastal and mountain access that you don't have to the same degree in New Jersey. They have a nice coast but they haven't got the mountains—I wouldn't trade them for anything. Besides, I wouldn't want to live in New Jersey. Princeton's pretty nice but there are areas of New Jersey that I don't think I could live in.

I don't know what all went into their decision but I'm sure that all those things were factors. However, there had to be more in order to convince the board. Now, the board may have been made up largely of southerners. I don't know. I think Frank Soday was on the board, and he was a professional southerner.

THACKRAY: In the beginning, there must have been a good supply of people saying, "This is all crazy. It's a mistake."

LITTLE: My recollection of that is that people in general thought it was a good idea; they didn't understand it, but my colleagues in chemistry would always say, "Bill, you're wasting your time. Nobody's going bring their labs here." And then one by one, over time, they'd come back and they said, "Bill, you were right." [laughter]

DAEMMRICH: When this was all in the planning stage, was there any conversation about other industrial parks around the country?

LITTLE: There weren't many. There was Stanford [Research Park]. Princeton was starting their Forestall Center at about the same time. Swearingen [Research Park] in Oklahoma was a year ahead of us. And in Alabama, around the space agency at Huntsville, they were starting one [Cummings Research Park]. That was about it. There was something at Cornell [Business & Technology Park], but as I understand it that was really a business park for insurance companies. Not so much for hard science. So there wasn't much competition.

If we had waited ten or fifteen more years, it might not have worked. The timing was right, because there was very little competition. Stanford Research Park was directed toward utilizing excess land. They couldn't sell their land because of the [Leland] Stanford will, and they had to find ways to get income. They built a big shopping center, which you may have been to, and that's been a producer. They also do some farming of that land. Then they've got the Stanford Research Park, which is a good income producer.

DAEMMRICH: There wasn't a lot of competition, but by the same token there was a lack of knowledge of how to do that sort of thing. There was no textbook to follow then. [laughter]

LITTLE: True. One of the interesting things is, every now and then I was asked to go to a meeting on the subject of research parks to represent the foundation. This would have been in the early 1970s perhaps, when there were some. They'd always want Research Triangle on the program because we were a forerunner and very successful. But they'd always schedule me at night after dinner when there wouldn't be too many people there. [laughter] What I doped out as a reason was that there was always a retinue of consultants ready and willing to tell you how to build a research park and what you ought to have in it. And of course, we didn't have any consultants. We did it ourselves. [laughter] That didn't go over real big with consultants who had a fair amount of influence because they were putting up a lot of the money to make these meetings work. It was always interesting that I'd come back after dinner to give my talk. [laughter] That was all right with me, though. I didn't care.

THACKRAY: In one way or another, you were engaged with the park from then until now, but how long did that particular summer job go on?

LITTLE: Two years. However, my traveling to ACS meetings went on for about five years maybe. Sooner or later, though, I had to get back to my research. I think that my work with the Research Triangle got me into the administration of the university. The

first administrative post was in 1959. The University decided it needed an office to organize the processes for institutional approval of research grant applications to make sure that all the bases had been touched, that there weren't commitments and proposals that the University had not been apprised of and where assurances had not been made, as well as to make sure that the proposal was something that was academically sound and not going to be an embarrassment to the University. There was also need for an office to assist in getting these things through the administrative processes, because in those days they would send a proposal to the chancellor and he'd send it maybe to the vice chancellor for business, who might send it to the dean of the graduate school, who might send it God knows where. There were a lot of reasons why that was needed. I was asked to start that program under the dean of the graduate school.

The chancellor at the time, who I consider to be the best chancellor we ever had, was Bill [William B.] Aycock. I went out and had lunch with him at one of these retirement communities a couple of weeks ago—he's now ninety years old—and he takes great pride in saying that during his whole chancellorship he added only one person to the administration and that was Bill Little. [laughter] At any rate that got me into the administration and it gave me a vantage point over the entire university, the School of Medicine, the School of Dentistry, the School of Public Health, as well as the College of Arts & Sciences. So I quickly became quite familiar with all the academic units, their culture, what kind of work they did, and gained a general understanding of the University that I couldn't have had otherwise. I had a greater vantage point of the whole university than any dean. I think it was because of my work with the Research Triangle that I was asked to take on that task. I did, and it was very successful. I only stayed there two years.

THACKRAY: And that led to what?

LITTLE: Three years later I was asked to chair the chemistry department. That's when we got our new building, which really made a big difference. Also, we had a whole bunch of new hires. I was chairman between 1965 and 1970 and that's when enrollments were growing, particularly in graduate programs, and we were hiring like crazy. I hired fourteen new faculty members, and they were all great! [laughter]

THACKRAY: And that was basically expanding?

LITTLE: Yes, expanding to meet the increased enrollment. Four good people achieved National Academy [of Sciences]. I feel very good about my years as chairman of chemistry. I think my colleagues do too, because I'm always warmly received by the chemistry department and that means a lot to me. I feel like it's my department.

I did that for five years and then I got back into the lab. That was a full-time occupation in those days because it was such a period of transition. We had such archaic policies. For example, when I became chairman a faculty member could not hire a graduate student on a research grant. [laughter]

During World War II there was a faculty member that had a lot of contracts with the federal government on isolating some natural products from the barks of trees that might have an anti-malarial agent. Because he had all this federal money, he was able to buy up all the graduate students and that stung those who were left. That policy was out of place in 1965. I turned that one around. We got a new chemistry building appropriated. We made several senior-level additions, which was not the tradition of the department, but, at the same time, we hired some of the brightest young people in the country who grew from assistant professors to members of the National Academy. There's been a real success story in that chemistry department.

THACKRAY: It seems that both in the department and in the University, there was some sort of cultural transition going on.

LITTLE: Absolutely. I mentioned a major one when I talked about non-employment on a research grant—except in the summertime. That was okay. We also had an antiquated curriculum. We revised it totally, first at the undergraduate level, then at the graduate level. We presented the case and got funding for a new chemistry building, which was the last state-appropriated building for about fifteen years because of budget problems. We won one of the Science Development Grants that Lyndon [B.] Johnson put into effect at NSF, and we invested that very wisely. It was an institutional grant that involved chemistry, physics, and the social sciences. The administration wanted us to use that to hire faculty members that would later be taken over by the University—no way! [laughter] We decided to put emphasis on support, secretarial, and shop personnel with the University picking that up later. We invested in new hires by giving a faculty member, when he first arrived, money for a postdoc.

In those days, if you wrote a proposal asking for a postdoc and you had never had one, it would get stricken. But, if you were to say in this proposal how one postdoc could replace Dr. So and So, it would go right through. Also, equipment money was very hard to come by, so we were able to buy all kinds of equipment. When you coupled that with an equipment budget of a million bucks that came with the new building, it was great. Plus, there was the big block contract we had jointly with physics and materials science from ARPA [Advanced Research Projects Agency], now DARPA [Defense Advanced Research Projects Agency], which was one of the accomplishments while I was in research administration. The physicists and I wrote that proposal and won it, and Jack [John F.] Kennedy announced the award when we were giving him an honorary degree. [laughter] These kinds of things were tools that helped build a great department.

I also started a policy that the department has followed of non-succession. That is to say, "Five years as chair and you're out. Time for a new chair." That did a lot of things. In the first place it avoided the situation where you think you knew how to do it. [laughter] That can be dangerous. Secondly, we had a fresh chairman every five years that was ready to take on the University. [laughter] Over time, we got one of the best cadres of leadership that you'll find anywhere. Both people that sit in here have been chairs of that department, Joe [Joseph L.] Templeton and Ed [Edward T.] Samulski, and both have made very important contributions. But after five years, it's time to get out and let a fresh person come in. That is a philosophy the department has continued to this day.

THACKRAY: In some of the national rankings that were done—they were quite popular in the 1970s and 1980s I believe—where within the University did the chemistry department rank?

LITTLE: We usually wound up in the top twenty of all institutions and the top dozen among state institutions. As far as within the University, we have for a long time been strong in sociology because of Howard Odum, and it will always be in the top two or three. Political science will always be high. Classics will always be high; there is a long tradition of strength in the classics. Physics has been low. Mathematics has been low. However, physics has improved a lot in recent years. Within the University we would probably be judged of those rankings as fifth or sixth, which is not bad. When it comes to winning external research support, we're in the top twenty nationally. We're way ahead of Duke in chemistry.

THACKRAY: So this is probably the leading department in the Southeast?

LITTLE: Clearly. Duke has, historically, had a strong chemistry department. I think they went through a little bit of a slump ten years ago. I think they are gaining new strength now.

DAEMMRICH: I'm struck that after being chairman of the department of chemistry, you were chairman of the division of natural sciences for a year.

LITTLE: That doesn't mean a great deal. If you're chairman of a division it means you sit on the personnel committee that reviews tenure promotions.

DAEMMRICH: But then after that you ran the development and public service office for five years.

LITTLE: Yes. It doesn't say it there but it was research, development, and public service. The title didn't have the word "research" in it because they didn't want it to sound like R&D [research & development]. Crazy reasoning, but I had the research responsibility too. That's something that happened four or five years after I was chairman of the department. I was asked to do that, and whenever I was asked to do anything I would salute the quarterdeck and march forward. I did that for four or five years.

DAEMMRICH: How did you find the development experience?

LITTLE: I made some reference to that earlier. We conducted the first institution-wide capital funds campaign. I had to learn how to do that, and I did. We had a great success.

THACKRAY: When was this?

DAEMMRICH: From 1973 to 1974.

THACKRAY: What was the target sum?

LITTLE: It was something like thirty-eight million. We went over the goal. That was pretty good for a first effort. That gave me an opportunity, again, to get to know the leadership of North Carolina because if you were going to have a campaign they were the ones you wanted for leadership. The head of R.J. Reynolds Tobacco Company, the head of Wachovia Bank, the head of the Belk Department Stores, which is a great big chain across the state. I got to know them all well, and they were always happy to find a faculty member that they thought was reasonably down to earth. Not a cottonhead. [laughter] Those friendships have continued to this day.

At that time I corrected an important problem the University had. The College of Arts & Sciences is the heart of the institution, and that's where all your undergraduates are. Undergraduate is one area where we've always excelled. If people die and leave their money to the University—the University is about twelve colleges or schools, including a medical school and a business school. Mr. Pogue, who made his money with one of the major banks, left twelve million to the University. That was just while I was there. That was the biggest gift we ever received, but it had to be divided among all the schools and units of the university because he'd left it to the University. His whole interest was arts and sciences, but arts and sciences in the universities were synonymous.

Every other school except arts and sciences had its own foundation, the business foundation, the medical foundation, the dental foundation, and so on.

I set as an objective to have an arts and sciences foundation. We worked that through the processes and now it's the second or third largest foundation that we've got at the University. It just recently, in the current campaign, raised something like sixty million for arts and sciences programs. Now there is a distinction between the College of Arts & Sciences and every other school in the college.

We also started a board of visitors, which was another opportunity to meet and work with the leadership of the state. I've made so many good friends. For a long time I chaired the nominating committee for the Research Triangle Foundation, and that was almost a one-man activity. I could reach back to my old experience with the board of visitors and the campaigns and pick out people we ought to have on the board of the Foundation that later became the leaders. The current chairman of the Foundation is a fellow who was on our board of visitors when I first got to know him. He is one of the most prominent lawyers in the state from down east, which is good because it involves the eastern part of the state. All these experiences have been very satisfying. My chemistry may have suffered, and indeed it did, but I don't think I have a colleague in the chemistry department that would say, "Bill, I wish you'd done something different."

THACKRAY: When was the moment that you realized that you were not going to be an academic research chemist of the standard-approved model?

LITTLE: The chairmanship of the department did a lot of damage, because in those days we had so many problems and so many opportunities that I gave it my full time. I had a postdoc who helped with my research group, but over the five-year period, I wouldn't take any new graduate students.

THACKRAY: That's a long time in the life of science.

LITTLE: Yes. Then I got back into it and changed my approach after a leave of absence at Stanford, but being called back into the administration for the development and public service activity took its toll. That pretty much washed me up as a producing chemist. But at the same time all that was happening, I was gaining more and more responsibilities in the Research Triangle, which by that time my colleagues respected and supported, so that it wasn't as though they suddenly had some deadwood.

DAEMMRICH: Did anyone say to you along the way, "Why don't you get an M.B.A.?"

LITTLE: No. [laughter]

DAEMMRICH: Where did you learn your strategic thinking in business?

LITTLE: I learned it from all the associations I had, but also a lot of it I had to develop myself. When I was chair of the chemistry department I had to devise the first five-year plan. I got the whole department together and we doped out the plan. First, we had to recognize that while for teaching purposes we had divisions—organic, inorganic, analytical, physical—in our hiring we were going to emphasize four areas. And it didn't matter what division they might fall in. We wanted to build strength in theoretical chemistry, coordination chemistry, the chemistry of excited states, and biologically-related chemistry. Whether they were physical, analytical, or organic chemists, they needed to fit into these divisions. We had to get out of the mold of just adding an organic chemist or an analytical chemist. We had to revise our curriculum to reflect that some of the labs were jointly taught by more than one faculty member coming from different departmental divisions. We also had to make several senior additions to break the mold of only hiring at the assistant professor level. All of this was with the full support of the department. We had a young group of tigers. [laughter] We had an older group that was going to seed. It took some effort to keep things in balance, but it worked.

THACKRAY: How did you keep the senior professors entertained and out of mischief in the face of such change?

LITTLE: They were afraid of the alternatives to me. [laughter] I had their confidence. I had to structure raises differently, and I got away with it. I had to change the non-hiring of graduate students during the academic year.

THACKRAY: In a state university, how much liberty do you have in setting faculty salaries on the individual level?

LITTLE: A fair amount. The University wisely, over the years, has always told the state that we do not want across-the-board increases. We want merit increases. Now, there have been times when we had stringent budget shortfalls, where the state has said, "We're going to give a two-percent salary increase, but not less than five hundred dollars." That kind of thing would happen from time to time. However, ordinary budgets at the university would always represent to the legislature that we want everything to be

on merit, and the legislature went along with it except when they felt they had a PR [public relations] problem with the state employees.

The trickiest thing to get around was state regulations regarding purchasing, construction, and classified personnel. It's hard to get the people in the Office of State Personnel in Raleigh, because that's who all the classified people work for, to know what a lab manager is, or to know that a purchasing agent for the sciences is different from a purchasing agent for office supplies.

THACKRAY: You haven't been able to put a whole set of people onto private money in some way?

LITTLE: That hasn't been possible. The closest thing to that was when we put a whole bunch of people on our Science Development Grant from the NSF that the University had to pick up based on what it got from the state.

THACKRAY: In the long trajectory of things, are state universities a bargain for states as opposed to the University? In other words, the state buys control of the University, but what fraction of the budget does the state put in?

LITTLE: That's a notion that gets played with by universities in a way that I'm not sure is fully straightforward. To answer your question, if you look at the expenditures the state was putting up about 38 percent, the last time I saw the figure. But that means that every time you get a big research grant you're cutting off the arm of the state one finger at a time. The state pays for virtually all the faculty salaries, except in areas like the medical school, where clinical earnings are part of the formula that you pay an M.D. The dental school is the same way. In most departments, however, the entire faculty salary and benefits are paid by the state. Summer employment for nine-month appointees is something different, but the basic salary is paid for by the state. The state has an equipment budget, which has improved over the years, but at the same time I'm sure we're buying more equipment with external funds than we are with state funds. But again, when you ask, "What percentage is paid for by the state?" the answer will be misleading.

THACKRAY: You've obviously had enormous success in academic administration on [al]most every level?

LITTLE: I don't know, but it's been fun. [laughter]

THACKRAY: What's the secret to herding cats?

LITTLE: Or carrying cats in a wheelbarrow? [laughter] You've got to be scrupulously honest with your colleagues, and you've got to try to get into their minds when you got a problem or an opportunity. You've got to win more battles than you lose, externally. You've got to listen. There are many times during my chairmanship when the faculty wanted to do one thing and I thought it was the wrong thing to do, but if they wanted to go a certain way on an issue I'd go. I don't know a single time that I made a mistake by doing that. You don't ever want to get to where you think you know how to do everything.

THACKRAY: Are you saying the faculty was right in those issues?

LITTLE: Yes. Their collective judgment was better than mine. I didn't have that many instances, but I don't know a single instance where they said "Turn left," and I wanted to go right, and so I turned left and it didn't work. You've got to show them success. You've got to win battles and let them think that they, as they indeed did, helped to make it happen. You've got to build an *esprit de corps*. You want to do everything you can to build collegiality within the group, and that's something that has characterized this department now for years. Whenever people from other universities, seminar speakers and so on, have come to visit, they've said, "I've never seen a department so collegial as this one." The department is aware of that characteristic and they do everything they can to foster it. Sure, you've got petty jealousies—for example, you're going to have some tension between the biological people and the analytical people or the physical chemists.

At one time, when I was chairman the national trend was to do away with analytical chemistry. We had a very strong analytical chemist by the name of Charles [N.] Reilley who was the second analytical chemist after [Izaak M.] Kolthoff to get into the National Academy. The physical chemists all wanted to do away with analytical, but I made it a policy to build analytical because we saw the environmental problems on the horizon. We knew that the chemistry of biological systems was going to be very dependent on analytical chemistry. To that end, we built up analytical. That was my biggest single battle with the faculty. I had to insist that we were going to build up analytical, and it paid off because we have the first or second best analytical group in the country. It almost consistently ranks right at the top. And nobody questions it today. [laughter]

THACKRAY: What's your view on the future of academic chemistry? In England, departments have been closing down. Here names are changing. What's your own view of that whole territory?

LITTLE: My view of it is that what I understand is chemistry will be important for as far as we can see. There may be the need to change some of the vocabulary a bit to make some aspects of chemistry more attractive. For example, right now in the department the people in the biological area are saying, "Shouldn't we change our name to the department of chemistry and biochemistry?" We've got a department of biochemistry in the med school, but their argument is that this would help us recruit graduate students. The department is resisting that effort, but that's an example of an issue related to your question. I just think it's unnecessary, because I think as long as there are molecules there's going to be a science of molecules. [laughter]

What you don't want to do is get into a position where you can't see beyond the molecule, and that's where areas like nanotechnology, laboratory on a chip, and material science come in. There are just many areas where you have got to go beyond your classical textbook organic chemistry and inorganic chemistry and become partially a physicist or a biologist, but I still believe in the concept of chemistry being the central science. I just don't think that people in biochemistry can function without chemistry. I think it's getting harder and harder for the physicists to do their thing in many areas without chemistry. Now sure, you can get into physics of gravitation and so on without paying a lot attention to molecules. But I think physics is doing more with molecules today than it ever has.

DAEMMRICH: Between 1995 and 2000 there was a big run-up in dot-coms around the country. Companies were being founded at the drop of a hat, looking for real estate, and putting up new offices and a lot of them went in these various university parks. How did that play out at the Research Triangle Park?

LITTLE: We had a number of dot-coms, and some of them have gone by the board, but I think you've got to be careful to distinguish between a dot-com that is simply marketing on the internet. You might have called that high-tech in the 1990s, but you would not today because everybody is selling on the internet. Now, a lot of those companies that were promoting advertising and sales on the internet you might call dot-coms went by the board. On the other hand, many of the companies that are developing the technology of the internet have been very successful.

DAEMMRICH: Do you and the managing committee and the managing board take a critical look at companies that want to move into RTP?

LITTLE: Most of the dot-coms have been start-up companies. But the companies that have come into the park, like Cisco [Systems, Inc.] and Network Appliances, Inc. are not

in trouble. Their stock may fluctuate because they're still not paying dividends, and in that sense they're like a start-up, but they're big giants and their stocks are improving over time. I don't think that's what the shakeout was all about. It was more about simple applications. If you look at the list of the companies that I know have gone out of business and just see how many of those you would classify as a dot-com, there are not many of them.

DAEMMRICH: Let me try the question a different way. To what degree do you set criteria that a company has to meet in order to be here?

LITTLE: There are some criteria, and I have to approach it two different ways. One is that the park is zoned in two different ways, research and research applications. Research applications allows a certain amount of manufacturing, but it has to be smoke-free, noise-free, and so on. Pure research is clear enough, I think. If you're in research applications—and IBM would fit into this—you've got to have a percentage of scientific and technical personnel that exceeds the industry standard average. I don't know quite how the Foundation manages that, but it does not seem to have been a problem.

THACKRAY: Has the University taken ownership shares in some of the companies that have come in?

LITTLE: The University, in terms of managing their endowments, has that in the hands of professional managers, and so they don't really make those decisions. Now, in another arena your question might have been, "Do the universities take an ownership stake in start-ups based on institutional technology?" I don't know the details of that but I think that by and large they don't, although I think sometimes they do. I think Duke is more likely to do that than a state institution is.

THACKRAY: What about individual faculty members? Does the chemistry department have some multimillionaires? Caltech [California Institute of Technology] certainly has plenty. [laughter] So does Stanford.

LITTLE: We have some that I think are on the way. Joe [Joseph M.] DeSimone is an example of one that's on the way. Ed Samulski might be another.

THACKRAY: What is the regulation about what you can and can't do as a faculty member in this regard?

LITTLE: There is a policy, but I'm not current on it. At one time when I was in the general administration of the university system, back when the federal government really wanted every university to have a conflict of interest policy, and one that addressed some of those questions, we had a policy. I've forgotten how it was worded. I've really lost touch with it.

THACKRAY: But do the operations of that translate to some version of a one-day-in-seven policy, in terms of having some of your time?

LITTLE: You're talking about conflict of time or conflict of effort, not interest. There is a generally-understood policy that I'm not sure is written down anywhere that one day a week for consulting is okay. That is very important in schools of business, for example, but it would also apply to how much time Joe DeSimone might spend with his companies. A day a week is a still unwritten policy, I believe.

THACKRAY: Talk for a minute about the successes and challenges that you see on the agenda for Research Triangle Park in the future. I don't think that financing RTP is a challenge. What are the challenges?

LITTLE: Our biggest challenge right now is deciding what we are going to be when we grow up. [laughter] We have sold all but 10 percent of the land. Over time the Foundation has played a very important role *vis-à-vis* the tenants. One thing, for example, which started a long time ago, is that we have been responsible for mowing the grass on the roads through the Park, because if it was left up to the state they'd get mowed twice a year and the Park wouldn't look like much. Ultimately, we're going to work that off on the tenants, and I'll talk about how we'll do that in a few minutes. One illustration is that IBM and some other companies were having real trouble with their computers going down because squirrels were jumping off the trees onto the power lines and shorting them out. So, they brought that problem to the foundation, and the foundation got in contact with the power companies. We decide to increase the easements, and the power companies cut the trees a little bit further back, and we solved that problem for everybody. The Park is not in any municipality. At one time Durham wanted to annex it, but the Foundation fought that annexation successfully.

THACKRAY: This is the Foundation of city managers, essentially?

LITTLE: Exactly. There's an owners and tenants association that can bring problems to the Foundation, but they can also do something else under some state legislation. They

can vote to ask the two counties to increase the *ad valorem* taxes by up to a certain amount, and then the owners and tenants can spend that money and the Foundation carries it out. You might be building jogging trails, beautification, improving the signage, or building athletic fields. We are a city manager of a community that cannot be annexed but can tax itself. The clever thing about taxing itself is that if you ask every company to contribute they couldn't all do it, but they can all pay taxes.

THACKRAY: Yes. Those realities are something that's evolved or been put in place over time, correct? This wasn't in any way part of initial consult?

LITTLE: Well, yes. But this business of non-annexation and *ad valorem* taxation all came in a single act of the general assembly when Durham tried to annex the Park. The Foundation had already been providing these services and been representing it. There are two major questions before the Foundation now. One of them is: what is going to be our role when all the land is sold? Because we still have obligations, and should have, to these companies. For the general benefit of the area and the state, we should be doing this. As long as we can make this a very special place, it's going to take an input from us of some sort. So, what are we going to be doing?

The other thing is that we'll be entering a phase of rehabilitation within the Park. For example, the IBM original buildings were built in 1965. Well, they're pretty obsolete buildings now. They don't belong to us, but if any company wants to sell its property the Foundation has the right of first refusal. Are we going to buy properties and renovate them? Are we going to find ways to work with companies to renovate buildings that need it and what would be our role in that? These are questions we haven't answered yet, but they're the things we're talking about. What can we do now to encourage the economic development of other areas of the state?

THACKRAY: Is another RTP Foundation somewhere else in the cards?

LITTLE: We looked into that five years ago. First, we looked at land that was immediately contiguous to the Park. That land costs two or three times what we could sell our land for. Partly because zoning in the Park, a company can only build on 15 percent of its holdings, where outside the Park you can build at 60 or 80 percent. So that land is more valuable. We can't buy it. We looked at some land that a private company owns about twenty miles from the Park. We were questioning if we could join with this company in developing some of that property. That broke down for tax reasons. So any land in the near vicinity of the Park seems out of the question. Our charter does say that we were "created for the purpose of promoting industrial and governmental research labs in the area, defined as the Research Triangle around these three institutions, or in any other part of the state." [laughter] So we can do it, but thus far we have felt that it is

better for Charlotte and other locations to develop their own research parks under their own local control with any assistance we can give them.

We sent most of their early tenants to them because they didn't fit our criteria. The Charlotte park is not really a research park. It's a high-tech service park. They've got a lot of things like the billing services for Sears, Roebuck [and Co.] and some life insurance companies. Not a great deal of real research. [Eastman] Kodak [Company] has a magnetic disk manufacturing facility there, and IBM has something there following their coming to our park. Our staff is visiting places like Winston-Salem, which has a park in prospect, particularly built around the Wake Forest [University] School of Medicine which is doing some very fine work, particularly on growing replacement organs. They're having some successes growing new bladders for people.

I had my bladder removed earlier this summer. I asked my surgeon, "Can't you save a little piece off that? Maybe we can take it up to Wake Forest and grow me a new one." [laughter] And he said, "No, that technology is not yet proven enough to warrant that." [laughter] But they're making great strides, and we're trying to help them every way we can to develop a research park. East Carolina University down in Greenville wants to do the same thing, and we've been down there to help them think through some of their problems. At the moment, most of what we're doing for the state, aside from having some of our companies build production facilities, is to encourage some more of our spin-offs to locate their manufacturing elsewhere in the state. That's an angle we're going to push.

THACKRAY: Has the Research Triangle Foundation grown rich with the success of the Park?

LITTLE: Yes, but we have ploughed a lot of money into the universities on this strip of land, which we'll visit Monday. We've put some forty or fifty million dollars into the joint programs of the three universities.

THACKRAY: When you look at the inter-university relationship and the university-industry relationship, what is the balance sheet of success and failure, joy and sorrow?

LITTLE: I don't remember the numbers, but when the Foundation celebrated its fortieth anniversary I took on a project of measuring research dollar flow in both directions, from the universities to park organizations, park to the universities, through subcontracting and contracting. I looked at the exchange of people, adjunct university appointments of park personnel, joint appointments of people from the universities in research, hiring exchanges. At one time N.C. State University had five deans that they recruited out of

the Park over time without any acrimony. I had some figures on that and they were pretty impressive, but they are almost ten years old and I don't remember them.

THACKRAY: So your impressionistic report is good?

LITTLE: It's a great deal. I think that the single greatest effect—this is my judgment—of the Research Triangle on the universities is that it has created a can-do attitude within the universities, and by "can-do" I mean that we can really move to the top ranks. We've got an area that is scientifically and engineeringly impacted, it's an attractive place to live, we can recruit the best faculty in the country, we can compete with each other and still be friends, and I think that the universities, all three of them, have achieved standing that they never could have achieved without the Research Triangle. I think that's the single most important thing that's happened. Hiring the best faculty is now easy.

When I was chairman, before the Park was deemed a success, it was tough. Of course, in those days, it was the old-boy network. I'd call up George [S.] Hammond and say, "George, we've got an opening for an organic chemist and I'd like to have your best graduate student apply for it." I will never forget what he said. He said, "Bill, I will not recommend my best graduate student to you because I don't think he would live in the South. But I would recommend my second-best graduate student, David Whitten." I wound up hiring David Whitten, and David Whitten wound up outstripping the number one by far. But that was the reaction I got. That really fired me up to push this notion of the Research Triangle.

When an organization comes to the Park we, the Foundation, often invite the CEO to come to one of our board meetings and we say to him or her, "Tell us in fifteen minutes what you're up to," and they'll always respond. One company man came and he said, "You know, last week I was in Germany talking to my counterpart and I told him that next week we were going to be opening our new facility in North Carolina. And he said, 'Ja, we know about North Carolina. It's in the Research Triangle Park.'" [laughter] That illustrates what I'm saying.

THACKRAY: That might be a great place to stop. We congratulate you on that achievement. [laughter]

LITTLE: Well, I hope I haven't been tooting my own horn.

THACKRAY: Not at all.

DAEMMRICH: One of the things I always ask at the end is: what did we forget to ask you?

LITTLE: I think we've done a good job of covering things. The only thing that I would say beyond what's already been said is that I sometimes feel that between the University and the Research Triangle I've lived in parallel universes—universes that occasionally intersect. [laughter]

THACKRAY: That probably has its charm.

LITTLE: Yes. I don't regret anything about I've done. I've got to tell you one more anecdote. The Triangle Universities Center for Advanced Studies, Incorporated acronym is TUCASI. Awkward, right? We had our first meeting after incorporation about a week before the National Humanities Center was going to announce their decision to come here—their announcement being at the Algonquin Hotel in New York City. We had a press release. I worked with the three news bureaus to develop one and we used the acronym T-U-C-A-S, Triangle Universities Center for Advanced Studies. [L.] Felix Joyner, who was the vice president for finance of the university system, said, "How do you pronounce that?" I said, "Well, TUCAS." [laughter] He said, "Oh my god, what are we going to do? We'll look like fools in New York City." John [T.] Caldwell, who was chancellor of N.C. State University said, "Wait a minute. We're incorporated." So, put an 'I' on there and it became TUCASI. It's got a nice lilt to it. [laughter] I took the press release and penned in an "I" everywhere we had the acronym. The Governors Inn didn't have a copy machine in those days. This was 1975. So I ran across the parking lot to a copy center and had a bunch of those made. And then when we walked out to the luncheon and press conference, with television sets and everything, and casually handed out these press releases and nobody raised a question. [laughter]

THACKRAY: [laughter] Very good. Thank you, Bill.

LITTLE: My pleasure.

[END OF AUDIO, FILE 1.1]

[END OF INTERVIEW]

INDEX