CHEMICAL HERITAGE FOUNDATION

ELKAN R. BLOUT

Transcripts of Interviews
Conducted by

James J. Bohning and Arnold Thackray

at

Harvard School of Public Health, Harvard Medical School, and Cambridge, Massachusetts

on

30 May 1991, 13 September 2002, and 22 November 2002

(With Subsequent Corrections and Additions)

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Chemical Heritage Foundation
Oral History Program
315 Chestnut Street
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ELKAN R. BLOUT

1919 Born in New York, New York on 2 July

Education

1939 B.A., chemistry, Princeton University
1942 Ph.D., chemistry, Columbia University

Professional Experience

1939-1942 Research Assistant, Columbia University
1942-1943 Research Fellow in Chemistry, Harvard University

Polaroid Corporation
1943-1962 Chemist, Research Division
1948-1958 Associate Director of Research
1958-1962 Vice President and General Manager of Research

1950-1962 Research Associate, The Children's Cancer Research Foundation, The Children's Hospital Medical Center, Boston, Massachusetts

Harvard Medical School
1950-1952 Research Associate in Pathology
1956-1960 Research Associate in Pathology
1960-1962 Lecturer in Biophysics
1962-1964 Professor of Biological Chemistry
1964-1990 Edward S. Harkness Professor of Biological Chemistry
1965-1969 Chairman, Department of Biological Chemistry
1990-present Edward S. Harkness Professor of Biological Chemistry, Emeritus

Harvard School of Public Health
1978-1989 Dean for Academic Affairs
1986-1988 Chairman, Department of Environmental Science and Physiology
1987-1990 Director, Division of Biological Sciences

1980-1990 Treasurer, National Academy of Sciences

Honors

1942	National Research Council Fellow, Harvard University
1954	Fellow, New York Academy of Sciences
1955	Fellow, American Academy of Arts and Sciences
1958	Fellow, American Association for the Advancement of Science
1962	A.M. (honorary), Harvard University
1963	Fellow, Optical Society of America
1969	Member, National Academy of Sciences
1970	Class of 1939 Achievement Award, Princeton University
1976	D.Sc. (honorary), Loyola University
1976	Foreign Member, USSR Academy of Sciences
1979	Member, Institute of Medicine
1982	Honor Scroll Award, Massachusetts Institute of Chemists, Division of the American Institute of Chemists
1990	National Medal of Science
1990	Elkan R. Blout Professorship in the Biological Sciences, Harvard University Medical School and School of Public Health
1991	Ralph F. Hirschmann Award in Peptide Chemistry, American Chemical Society

ABSTRACT

Elkan R. Blout begins the interview with a description of his family and childhood. Growing up in Manhattan as an only child, Blout was cared for by his parents, aunts, and uncles. He attended DeWitt Clinton High School, in the Bronx, earning marks that were high enough to skip three grades. Blout was still too young to attend college when he graduated, so he enrolled in the Philips Exeter Academy. The school was tough both scholastically and socially, but he made it through by attending his classes regularly, and playing bridge. After a year at Exeter, Blout attended Princeton University, becoming one of only twelve Jewish students accepted in 1935. As a Jewish student, Blout struggled against discrimination from both the University and the students. He graduated in 1939, and married Joan E. Dreyfus that same year. In 1942, Blout received his Ph.D. in chemistry from Columbia University. He then accepted a fellowship at Harvard University, where he worked with Louis Feiser and R. B. Woodward. After a year, Edwin H. Land offered Blout a position at the Polaroid Company. At Polaroid, he helped develop the instant photographic process and the color translating microscope. At the same time, he received a research grant to study synthetic polypeptides, and established a spectroscopy laboratory at Children's Hospital of Boston. In 1961, Blout left Polaroid for more academic pursuits at Harvard Medical School. During his long, fruitful relationship with Harvard University, Blout has done much to improve both Harvard's Medical School and Harvard's School of Public Health. In 1984, Blout divorced Joan Dreyfus and married Gail Ferris. In 1991, Blout became the senior science advisor for the Food and Drug Administration. Blout concludes the interview by expressing gratitude for the John Philips Award, which he was awarded in 1998.

INTERVIEWERS

James J. Bohning is Professor of Chemistry Emeritus at Wilkes University, where he was a faculty member from 1959 to 1990. He served there as chemistry department chair from 1970 to 1986 and environmental science department chair from 1987 to 1990. He was chair of the American Chemical Society's Division of the History of Chemistry in 1986, received the Division's outstanding paper award in 1989, and presented more than twenty-five papers before the Division at national meetings of the Society. He has been on the advisory committee of the Society's National Historic Chemical Landmarks committee since its inception in 1992. He developed the oral history program of the Chemical Heritage Foundation beginning in 1985, and was the Foundation's Director of Oral History from 1990 to 1995. He currently writes for the American Chemical Society News Service.

Arnold Thackray is 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.

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INTERVIEWER: James J. Bohning

LOCATION: Harvard School of Public Health

DATE: 30 May 1991

BOHNING: Dr. Blout, you were born on 2 July 1919. Please discuss your childhood and family life.

BLOUT: It's not difficult to recall. I was an only child during the [Great] Depression years, and that had, I believe, an appreciable effect on the way I grew up and my personality. Many people have sympathized with me for being an only child, but I felt it was misplaced sympathy. I was well directed and quite happy as an only child.

I was born in New York City at the Babies' Hospital. My mother [Lillian B.] was a loving, caring woman. My father [Eugene] was also loving, and he took great pride in my efforts from the very beginning. My parents had neither professional jobs nor college educations, which I think influenced my life. My father worked in industry as a salesman for the lace industry. He was fairly successful at times, other times he struggled, and occasionally he was out of work. I saw that as I was growing up.

My mother helped support the family by becoming a rental agent, or what we would now call a real estate agent, in upper Manhattan. We lived in the Inwood suburb of Manhattan, which, when I was young, consisted of low-level apartment buildings, intermixed with farming areas.

I went to a public school in Manhattan named elementary school P.S. 52. I was fortunate to go in that particular era, because instead of spending eight years in elementary school, I only spent five years. I skipped three years, permitting me to graduate after only five years and move on to high school. The high school I attended in upper Manhattan was named DeWitt Clinton High School. It was located was over the Spuyten Duyvil [Creek] in the Bronx. I suppose I did fairly well in both elementary school and in high school, as far as grades were concerned. I remember that I got straight As, which everybody expected of me.

Though I was an only child, my childhood was the focus of six adults. My mother's sister and her husband, who lived in New Jersey, lavished me with attention because they had no children of their own. For similar reasons, my grand aunt and uncle paid me much attention. My grand uncle had been a dentist in Brooklyn, and he was a

strong influence in my youth. Moreover, having been a district attorney in one of the New Jersey counties, my uncle was another major influence. My family frequently implied that I should be a lawyer because I did well in school, and law was obviously a respected profession.

BOHNING: What was it like growing up in New York?

BLOUT: My family began to feel the Depression in the late 1920s, which affected my childhood. Though I was spoiled by six loving "parents," I still had to earn money for the family. I held various small jobs as a child, such as selling the *Saturday Evening Post*, and making deliveries for the local tailor. The neighborhood was quite safe. I had lots of friends my own age to play with, and there was no terror in the schools like there is today. I walked five or six blocks to elementary school with no problems.

High school was an awkward experience for me because it was a very large and I was quite young. Regardless, I did fairly well scholastically, gaining a strong interest in psychology, and joining the so-called "psychology squad." I graduated a few weeks before I turned fifteen. Interestingly, about fifteen or twenty years ago, one of my old high school teachers came to visit me in Belton, during a visit to Boston; it was a nice experience.

Having graduated high school early, I was too young to enter college, and was advised to attend another school for a year. I felt comfortable with that prospect, as did the rest of the family; in fact, I looked forward to it. My uncle, the district attorney, offered to pay half the cost, and somehow the family got together the thousand dollars necessary for me to attend Exeter [Phillips Exeter Academy] for a year.

My last days at home were an incredibly emotional experience. I remember my mother crying as I was leaving for Exeter; her little boy was going away. By that time, she had been diagnosed with breast cancer, and eventually doctors had to remove one of her breasts.

Exeter was great. Although I had been away to camp for two years, I had never spent much time away from my family. I felt I was really away, being two hundred and fifty to three-hundred miles from New York. At that time, Exeter was a very different experience. It was a tough school, both scholastically and socially. I adjusted by attending my classes, learning a reasonable amount, and most of all, learning to play bridge. I actually played about eight hours a day while I was at Exeter; every waking hour that I wasn't in class. I loved it.

Perhaps the most important part of my Exeter experience was meeting a chemistry instructor named John Hogg. He was a literate, dedicated man who enjoyed teaching and studying chemistry. It was in his classes that I began to think about a career in chemistry rather than law.

BOHNING: Had you had any chemistry at DeWitt Clinton?

BLOUT: Not that I remember. When I decided to go to college, I chose to enter as a chemical engineer rather than as a chemist, which I think was partly because of my background. I felt an engineer would have a better chance of earning a living. It wasn't that I was particularly engineering-oriented, but I either consciously or subconsciously thought that was better.

BOHNING: Why did you select Princeton?

BLOUT: I think it was a logical choice. I was looking for a college outside of New York; in other words, not Columbia [University]; but, I wanted to remain fairly close to New York. My mother was not well at the time, and she was experiencing some physical problems. Also, a rather distant cousin of mine had been attending Princeton as a writer, and was rather fond of the school. In those days, if you came from a reasonably good school like Exeter, with reasonably good grades, you just decided where you wanted to go and were accepted; at least, that was what I remember.

I didn't apply to any other college, and I was accepted at Princeton. Of course, I didn't realize that Princeton had an implicit, or possibly even explicit, quota on Jewish students. Of the six hundred students who entered with me, exactly twelve were Jewish. It was amazing. I think that was part of the routine in those days, and it certainly had an influence on my life.

I didn't have any money; I went there on scholarship, but that wasn't enough to carry me through, so I began to look for other ways to pay for school. I'll come to that, because that was after the first year.

In the first year something significant happened, too. I took elementary chemistry with Hubert Alyea at Princeton, and I found it very interesting. Six weeks after I arrived at Princeton, I received a perfect score on my first quiz, and that encouraged me to switch from a chemical engineering to chemistry major. I might have heard it was unusual for a Jew to major in chemical engineering, too; nevertheless, I switched to chemistry and never regretted it.

When I arrived at Princeton, I was given a single room without being asked whether I wanted a roommate or not. During the first year, I met Richard Reiss, a previous student of Lawrenceville [The Lawrenceville School], in New York. We became friend, and roomed together for all the subsequent years. He eventually became my brother-in-law, and is still my very close friend; he lives here in the Boston area. He and I both married sisters.

BOHNING: Did you start there in 1935?

BLOUT: Yes. I graduated in the class of 1939. Hugh Taylor had been there, and [Theodore William] Richards was on the faculty. Princeton University is very dedicated to teaching, so there were a lot of good teachers besides Alyea. For instance, there were Gregg Dougherty and Everett Wallis, both organic chemists, and C. P. [Charles] Smyth. I wouldn't say it was a great department, but it was a very good undergraduate department.

The work on my undergraduate thesis, which is required at Princeton, became a very formative period in my life. I worked with Gregg Dougherty on analogs of sulfanilamide. I made numerous analogs, wrote a thesis, and presented it. It was received very well. My thesis topic was perhaps also my first interest in life science while I was at Princeton. I didn't even take biology; I took all my chemistry courses.

BOHNING: Was it organic chemistry that particularly interested you?

BLOUT: Yes. The potential to create new things was particularly interesting.

BOHNING: Who were some of your student peers at that time?

BLOUT: One of my peers was Bill [William A.] Bours, who eventually became a senior vice president at DuPont. Another was Jack [James M.] Seabrook, whom inherited Seabrook Farms; the frozen vegetable producers. There was also Dick [Richard R.] Hough; an engineer who became a vice president of AT&T [American Telephone & Telegraph, Incorporated]. It was a good, representative group.

My life at Princeton was quite different from most. For instance, I wasn't invited to join one of the eating clubs, possibly because I was Jewish and poor, or maybe because I wasn't socially acceptable, I don't know. Dick Reiss was an athlete and he was invited to join one of the clubs, but he decided not to join. Instead, he and I ate in town most of the time. We became friends, and in a sense, we worked together.

As I said, my family didn't have the money to put me through Princeton, and things were pretty bad during the period from 1935 to 1937. I looked around and saw there was a sort of a moribund student activity called the Campus Sales Agency at Princeton. Back then, the poorest students were expected to work while they were in college, which is not true anymore, as far as I can see. In any case, there was a series of

student agencies that gave students the opportunity to earn money. One could also wait tables in the student commons, which I found unappealing.

I found the Campus Sales Agency, and was offered the opportunity to run it. The agency had two functions. One was to deliver food to the students' rooms between nine and eleven o'clock at night, when they were presumably studying. There was a crew of students who came around with sandwiches and sold them to earn money. The other function, which I developed, sold students various pieces of equipment; small radios, clocks, lipstick cases for girlfriends, tape recorders, mementos, et cetera; with Princeton seals on them. I organized both aspects of the Campus Sales Agency, employed a crew of students to work for me, and supported myself at Princeton that way. I came out of Princeton with two thousand dollars more than when I entered, which was a lot of money in those days! [laughter]

I could go into more details, for I was intensely innovative and interested in that Agency. I contacted the College Seal and Crest Company here in Cambridge and got them to make items for us. I also contacted a wholesaler of audio equipment in New York, named Masters [Master's Mark], and bought equipment from them on credit at wholesale prices. The Campus Sales Agency expanded greatly under my leadership.

BOHNING: Did Reiss work with you in the Agency?

BLOUT: Yes. He was more or less responsible for the sandwich sales of the Agency. His father was a physician in New York, and actually took care of my mother when she became ill. We became close that way. By that time, we had moved from upper Manhattan to midtown Manhattan. When I went to Princeton, we lived at 51 West 86th Street. Things had begun to pick up a little for my father. We had a three or four-room apartment, but we always had financial problems, which were intensified by my mother's illness.

I met my wife, Joan [E.] Dreyfus, while I lived at 51 West 86th Street. She lived down the block, and we first met one day while we were walking our dogs; both of whom were similar, smooth-haired fox terriers. She had an older sister, Lorraine, who I introduced to Dick Reiss. They used to visit us at Princeton. Actually, Joan and I married after I graduated in 1939, and Reiss and Lorraine were married within a week.

Princeton was very different from Exeter. At Exeter, as I mentioned to you, I spent most of my days playing bridge; whereas at Princeton, when I wasn't working at the Campus Sales Agency, I spent most of my nights playing poker. I first learned to play poker at Princeton. I loved playing, and still do. As you can see, I wasn't a very serious student at Princeton. My grades usually weren't much better than Bs. However, towards the end of my senior year I became more serious about life because I was thinking of getting married. My mother had died the previous year, and I decided that I had to go on and get a Ph.D. if I were to make something of my life.

I applied to graduate school at Harvard and Columbia. Harvard turned me down; my grades weren't good enough, but the rejection was probably good for me. On the other hand, Columbia took a chance, accepted me, and gave me a teaching assistantship. I entered Columbia in September of 1939.

BOHNING: Were there any faculty at Princeton who had an influence on you or guided you in any way?

BLOUT: Gregg Dougherty was the man. Everett Wallis had a negative influence. He either didn't like me or didn't think I was good enough, but I know he gave me negative recommendations. It was interesting, and I learned that there will always be people who like me, and those who don't.

[END OF TAPE, SIDE 1]

BLOUT: I have mixed emotions when I think about Princeton. It hurt that I wasn't as socially acceptable as other people. I felt grateful for the quality of the teaching and the quality of some of the students. Moreover, I felt grateful for having the opportunity to develop there, not only career-wise but in other important ways, as I have indicated.

BOHNING: How old were you when you graduated from Princeton?

BLOUT: I was twenty. I got out of Princeton at twenty and was married the August after I graduated. How could I afford to be married? I had enough money to live on from my assistantship, but marriage was a much greater prospect. My wife, Joan Dreyfus, was the daughter of a successful salesman in New York. Her mother had died the previous year, and her father had a friend and wanted to remarry. He agreed to continue Joan's allowance for the years that I was in graduate school if she were married. So, with the combination of her allowance, which was I think a couple of hundred dollars a month, and my assistantship, we got married and started to live in an apartment on 122nd Street.

It was a good marriage in many ways, but I didn't know as much then as I know now. The arguments that Joan and I got into during our courtship should have tipped me off to potential problems if we were married, but they didn't; I was just too young. We had good times and stormy times that continued right into our marriage. I don't think we were too sensitive to each others feelings. We decided to wait to have children until after I got my Ph.D., but even then we waited. So it was difficult sometimes. We never shared the kinds of feelings that I share with my present wife, but in those days, couples stayed together rather than divorce. She tried to be supportive in her own way, and I

think she was. I also tried to be supportive of her, but our temperaments always clashed, which was something I didn't realized until later; we were so different temperamentally. There are many incidents I could recite, personal incidents, but I don't know if they belong in this kind of history.

BOHNING: Did she have a degree?

BLOUT: She attended Skidmore College, but she dropped out after her mother died, and moved back to New York City to live with her father. She didn't get her degree until three years into our marriage. Her sister was two years ahead of her at the Connecticut College for Women.

Joan loved to entertain, and she was good at it. She was born in Montgomery, Alabama, and she enjoyed entertaining. I learned to enjoy it. I was, as you know, an only child, so I wasn't as social as her.

She had two siblings; an older brother and an older sister; she was the youngest child. She has always been a very determined lady, and you will see the end of this saga as we go on. In retrospect, I suppose our parents more or less pushed us towards marriage. Both our fathers had lost their wives, and we bereaved our mothers. Both our fathers, especially her father, wanted to remarry and start a new life.

She was close to her family, especially to her sister. The incident I will describe is one that made a big impression on me, and was typical of our marriage. In August of 1942, I was preparing for the defense of my Ph.D. thesis. I woke up one morning feeling sick to my stomach. I told Joan I was sick, and she consoled, "Don't worry, it's nothing. Forget it." She was going to visit her sister, who was living in Queens, and I asked, "Would you mind not going?" She replied, "No, I want to go." So she went.

I began to feel sicker and sicker, so I called Dr. Reiss [my roommate's father] and asked if he would take some time to see me. I came in and he did a blood count, felt my abdomen, and said, "Elkan, you need to go to the hospital, and quick!" I went into the hospital and had my appendix removed while my wife was out with her sister. That sort of typifies one aspect of our marriage. She was, and is, a lady who wants to be wanted, but is very determined to do what she wants.

By that time, she was pregnant and we were moving to Cambridge. I had secured a postdoctoral fellowship, one of the best that I could get at that time, at the National Research Council Fellowship. I was one of only five chemistry fellows in the country. I had to write propositions indicating three different areas of research I might work on, and even looking back on them now I think they were pretty good. I wanted to work with Reginald Patrick Linstead, a chemistry professor at Harvard. I had heard him lecture at Columbia and I thought he was a very good chemist. Further, I had done my synthetic thesis on glycones related to the strophanthus alkaloids, the steroid aglycones (1).

I got this National Research Council Fellowship, and we were set to move to Cambridge, which we did after I recovered from my appendectomy. I remember going under with anesthesia and saying, "Can you believe it? Here I am, going into an operating room, and I have my Ph.D. thesis examination two days from now!" [laughter] That's what happened. Everything worked out well, except that Joan's absence when I needed her had scarred me. It was typical of our relationship.

We moved to Cambridge for my position as a postdoctoral fellow, and lived in a small apartment on Broadway. The rent was sixty dollars a month. The apartment was wonderful, and it even had a little room for our future baby. Interestingly, my wife had some sort of unidentified blood problem, and when we came to Cambridge, her obstetrician was Duncan [E.] Reid; the future head of the Boston Lying-in Hospital. He suggested that she go to Dr. Denny Brown, a blood specialist at Harvard. Just yesterday we went to a Harvard Medical School luncheon for emeriti professors, and Mrs. Denny Brown was sitting at our table. [laughter] It's a small world.

BOHNING: Let discuss your experiences at Columbia University. You worked there with [Robert C.] Elderfield, correct?

BLOUT: Yes. I didn't know whom I would work with when I came to Columbia, but it soon became apparent that was most sympathetic to Elderfield.

BOHNING: How did you arrive at that conclusion?

BLOUT: He was interested in synthesis of compounds of biological interest. Although I was interested in spectroscopy and physical methods, my basic career goal was synthesis. So I worked with Elderfield.

BOHNING: When did you develop an interest in spectroscopy?

BLOUT: It developed during my senior year at Princeton, and was aided by my graduate career, where I continued to be interested in ultraviolet spectroscopy; which was one of the available tools of that time. I remember thinking about using it for characterizing some of the lactones and aglycones.

BOHNING: Did you get that exposure at Princeton in physical chemistry?

BLOUT: Yes, physical chemistry in that period.

BOHNING: You wrote three papers with Elderfield (2). In the first one, there were some UV spectra, but there was no Beckman DU [spectrophotometer] at that time. What was it like taking spectra on a Hilger spectrophotometer?

BLOUT: You developed and read your own plates. [laughter] We were comparing areas of optical density. It was quite a job, but there was no Beckman DU at the time.

There were two other graduate students in the lab. One was my laboratory partner, Nelson [Jordan] Leonard. The other was Josef Fried, who was a year senior to us. The three of us worked together and became very close friends. More than fifty years later, we're still good friends. We talk with each other every week or two, and support each other in various ways. Both of their wives have died in the last ten years, so we have sympathies.

BOHNING: Was [Louis P.] Hammett still there as chairman when the War began?

BLOUT: Yes. The Manhattan Project had started. None of us, as organic chemists, were involved in it, but we were aware of it. [Harold C.] Urey was there, and his use of physical methods certainly helped shape my career. Elderfield was around the lab all the time at night; he frequently worked at night.

BOHNING: What was it like working for Elderfield?

BLOUT: It was a mixed bag. He let you work on your own, which was good for a graduate student. He was ambitious and loved science, but he wasn't a happy person; he had a drinking problem that was evident to the students, but we liked him and we admired him in a way. He couldn't get Gus Fried a good job, or help him get a good job. He thought Nelson Leonard fit his idea of a bright, WASP [White Anglo-Saxon Protestant] chemist, and got him a job at the University of Illinois, which was the best place for organic chemistry at that time. Further, he supported my application for a National Research Council Fellowship. Anti-Semitism was common in chemistry at that time, so there weren't too many Jewish chemists who got jobs in industry. That didn't phase me, because by then it was clear I was leaning towards an academic career, or a career in chemistry relating to the life sciences. That's why I went to Harvard to spend, as one of my friends has said, my "obligatory postdoctoral year at Harvard." [laughter]

BOHNING: With the National Research Council Fellowship, could you pick where you wanted to go?

BLOUT: Yes. You had to be accepted, but you could pick where you wanted to go. Linstead was delighted to have me. The only problem was that the week after I arrived in September of 1942, he called me into his office and said, "I'm sorry to have to tell you this, but I'm going back to England. I've been called back to England, and I won't be involved in your post-doctorate work." I said to him, "What should I do?" The other organic chemistry professor at Harvard was [Louis F.] Fieser. He said to me, "You can transfer your fellowship to Fieser, but I'd like you to talk to a young man up on the second floor who's an instructor, who I think is very good. His name is Bob [Robert B.] Woodward." [laughter] That's how I, in September of 1942, got to know Bob, who was only three years older than I was at that time.

BOHNING: Bill [William von Eggers] Doering would have been there, too.

BLOUT: He was a student at that time.

BOHNING: I think he worked for [Carl] Noller. Noller was only there a year, and then he went to work for Linstead.

BLOUT: Right. I knew Bill Doering and Dick [Richard Baldwin] Turner; there was a whole group of us who were there during that time. Saul [Gerald] Cohen was working with [Paul D.] Bartlett.

I decided to transfer my fellowship from Linstead to Fieser. Fieser was doing War work, and was anxious for me to be there. That was one week in September 1942. But I started to talk to Bob Woodward, and I told him about my three propositions. One of them was on β-diketones, and he became intrigued with that. Another one was on the structure of yohimbine, an alkaloid. He asserted, "I've had similar ideas. That's a good proposition." I responded, "Yes, I think it is, too; but I want to concentrate on the acyloin β-diketone area. I think it could be accomplished quite easily." He said, "I agree. Why don't we do it together?" We worked together on that project and published a paper on it (3).

BOHNING: Yes, I have a copy here.

BLOUT: Yes. That was probably what I think was the last lab work that Bob Woodward ever did. You noticed the spectra?

BOHNING: Yes. I think they were done on a Beckman DU.

BLOUT: I think so. I don't remember reading any plates.

BOHNING: But Woodward worked in the lab with you?

BLOUT: Yes. He actually crystallized some compounds with me.

BOHNING: Really? That's amazing. I have heard that he rarely worked in the lab.

BLOUT: That was true, but this time he did. He and I became quite good friends. We went out together; I knew his first wife, Irja [Pullman]. You don't have an oral history with him, do you?

BOHNING: No, unfortunately.

BLOUT: I feel guilty when I mention that, because I have the responsibility of putting together his memoir for the National Academy of Sciences; I've been putting it off and putting it off. I am going to do it.

BOHNING: Are you aware of the Woodward exhibit that the Center [for the History of Chemistry] is putting together?

BLOUT: Yes, very much so. I've been on that committee helping Al Bader. Alfred Bader has cried on my shoulders several times about people who would not give. [laughter]

BOHNING: Just as an aside, tomorrow I'm going to be at the Harvard archives. The person who's putting the exhibit together wants me to look for better IR spectra from the early days. I've got all her notes and I'm going over there to look for some of his original IR spectra.

BLOUT: Have you been in the archives?

BOHNING: No.

BLOUT: I hear they're not in good shape.

BOHNING: That's what I've heard, but I have some file numbers that supposedly will be the right place to look. I'll be searching through some of Woodward's IR spectra tomorrow.

BLOUT: Woodward and I became friends when we did that work together. Fieser wasn't around much. Mary Fieser was around, but that wasn't the same. So while I nominally worked with Fieser as far as the fellowship was concerned, I really worked with Bob Woodward. We not only had science in common, but we both liked to play poker. [laughter] We played poker, and even organized a game in the basement of Converse Hall. We played practically every week, not for big stakes, but enough to make it interesting as graduate students and as a young faculty member. We had a great time.

BOHNING: Who else was involved in the poker games?

BLOUT: Fred [Frederic Chewming] Chang. I'm not sure if Bill Doering ever played. Fred [Frederick Cohane] Henriques played. There was a whole group of chemists, and that game went on for a long time. Bob and I continued to play poker together until his death.

BOHNING: The quinine work was going on at this time, too, wasn't it?

BLOUT: Yes, the quinine work had begun. Bob had become a consultant to Polaroid [Company]. One of the reasons was the possibility of synthesizing quinine. You remember, quinine was the substance which was used in the early polarizers, quinine crystals, and the sources of quinine were being threatened by the War.

[END OF TAPE, SIDE 2]

BLOUT: I don't remember when the quinine work started.

BOHNING: It must have been around 1942, because then Doering left to go to Columbia.

BLOUT: There's a story to that. Do you want to hear that story?

BOHNING: Yes. [laughter]

BLOUT: He left at the end of the 1942-1943 academic year to go to Columbia. Was he doing the quinine work?

BOHNING: Yes, it had already started.

BLOUT: We can back up a little. I enjoyed my year at Harvard very much, and as it grew closer to May, I began to think about what I would do next year. I spoke to Louie Fieser and he said to me, "Elkan, I know we haven't done much together, but why don't you stick around? I'll support your fellowship for another year; after which, you can have an instructorship," which was the first rank in those days. I said, "That's very kind of you."

I also spoke to the people at Columbia. Elderfield said, "We'll offer you an instructorship in September 1943, but you must realize we are such an inbred department that there is really no chance you'll get tenure here." Then, I spoke with Art [Arthur C.] Cope, who had been at Columbia, about the possibility of a job. I told him that my interests were evolving towards the biological. He asked, "Why don't you go and see my friend Jim [James Maurice] Sprague at Sharp & Dohme [which became Merck, Sharp & Dohme]?" I went down there sometime in April, and they offered me a job, so I rented a house in Philadelphia.

Sometime in August, when I was about to finish my year, we gave a little party at our house to thank all the people who had been so nice to us during this year. Of course, one of the people we invited was Bob Woodward. He was late to the party. We were packed and ready to move. Our first child, Jim, had been born. I remember the dishes were in these wooden barrels they used to use to pack things. When Bob came in late, I asked, "I'm glad you came, but why were you so late?" He replied, "I was with [Edwin H.] Land ["Din Land"] and he didn't want to let me go; I just couldn't get away. In fact, when I said I had to go, he asked, 'Well, why do you have to go?' I asserted, 'A friend of mine, a chemist, is leaving Harvard in a week and they're having a farewell party.' Din questioned, 'Is he a good chemist?'" Bob said the polite thing, "Of course," or something

like that. Then, Land asked, "Why doesn't he come down and work for Polaroid? We don't have enough chemists here; we only have one chemist, and we need chemists, as you know." So Bob responded, "I'll mention this to him and see if he wants to come tomorrow."

When Bob mentioned it to me, it sort of took me by surprise, but I met Din Land the next afternoon, regardless. I remember he interviewed me in his corner office, which was in this converted chocolate factory near MIT. He outlined for me some of the things Polaroid was doing, emphasizing that their main mission was to convince the automobile industry that they should put polarizers on headlights to cut down the forty-thousand traffic deaths each year. He said, "We have problems with manufacturing the polarizing materials. Some of them are chemical problems; stability, and so forth. We're also doing some work related to the War effort. I can't tell you about this yet, but it would keep you out of the War, certainly. We're really interested in light and light absorption because that's how polarizers work. I think your background just fits our needs."

After we spoke for about an hour, I said, "But I'm going to Sharp & Dohme in a week." He questioned, "What would it take to have you stay here?" I replied, "I would be pleased to work on company problems if I could have an assistant who works only on what I want to do." He said, "Fine. No problem. [laughter] By the way, what's your salary going to be at Sharp & Dohme?" I told him and he said, "I know I'm giving you an assistant, but I'll give you 50 percent higher salary, too." [laughter] So that tells you several things about him and about me.

Consequently, we unpacked and I started at Polaroid with Land, which I haven't regretted at all. It's interesting how a fortuitous conversation, outside your camp, can change your whole life. I was never even aware of it at the time. But it's sort of the unconventional thing that I've done in my life.

BOHNING: What was Polaroid like when you started?

BLOUT: They had only one chemist, Cutler [D.] West. What intrigued me was that when Din said, "Let's go back and meet Cutler," he was back in this hot, dirty laboratory puttering around. He was the man who helped Din crystallize the quinine periodide crystals used in the polarizer; Cutler also did the structural work on those materials. He was a very erudite but introverted person. I was hired as the head of organic chemistry, and he was the other person! [laughter]

The company was small except for the War work. Polarizers were being used in various ways in the War. For instance, polarizers were used in goggles, or for viewing three-dimensional photographs, the so-called vectograph. At that time, the company wasn't doing any work in photography; such work wasn't even considered then. As I said, I never regretted it. If you noticed in my publication list, I decided that spectroscopy was related to Polaroid's interests, so those publications were during those

years (4). The company had a challenging, competitive, and personally satisfying atmosphere.

BOHNING: Tell me the story about Doering and Columbia.

BLOUT: I mentioned that I had three job offers before I met Land at Polaroid, one of which I accepted. When I told Elderfield and the other Columbia people that I didn't think it would be good for me to go back there under those conditions, they asked, "Whom at Harvard would you recommend to us?" I responded, "There's a bright, young guy, working with Wooward on quinine. His name is Bill Doering. He's a very outgoing, aggressive guy." So they looked at him, and that's how he got to Columbia. I think he knows it, but he may have repressed it.

BOHNING: He didn't tell me that part of it. [laughter]

BLOUT: They never thanked me for that recommendation. Has he told you about some of the problems he had there?

BOHNING: Yes. One of the reasons I mentioned Elderfield was because there was a connection.

BLOUT: Yes. They never thanked me at Columbia because, although Doering was a very capable chemist, they thought he was bad news for their department.

BOHNING: Yes. The quinine synthesis was announced publicly while he was there, and he said the announcement sort of secured his position for a few years because of the publicity they were getting. Anyway, let's return to your story.

BLOUT: All right. I started in on the fifth floor of a converted-loft building, on Main Street, in Cambridge. I really enjoyed the work. I enjoyed being associated with people who wanted to make products, and the challenges of having only a few chemists. Further, I enjoyed the potential to contribute to both science and society by aiding in the development of the polarized headlight system. It was a heavy several years.

Gradually, the chemistry research group's responsibility increased, as did our workload. In addition to the polarizer work, we made optical plastics for various uses, which were made of light-transmitting polymers. I was involved with spectroscopy, and as my work shifted from ultraviolet to infrared spectroscopy, I began to think about how

spectroscopy could be applied to biological materials. During that period, we also began to think about what Polaroid could do in that area. I'll tell you about several incidents that might be revealing.

The first and foremost incident was Din's idea to develop an instant photographic process, which has been well accounted for in the literature and the press. By that time, he had moved to his own small laboratory across the street from the main building, and began developing the procedure for processing instant black-and-white photography; that is, the cameras needed to produce the pictures. He generally asked the chemists and me to work on very specific problems, but he never engaged the chemists with a constructive dialogue about his problems. He ran the project himself, which was the way he enjoyed work. I didn't mind it; I felt it was his problem.

As our work progressed, the polarized headlights didn't look as if they would succeed. Although the company had grown to maybe eight hundred or a thousand people during the War, by the War's end it was clear the company had no real products to sustain a group that large. Their only products were polarizing filters, and polarizing sunglasses.

Therefore, we began to think of what products could be developed. At that time, Din had a good friend named Robert [D.] Conrad, who was the head of the Office of Naval Research. He was a captain in the navy, and a very imaginative man. We were doing ultraviolet absorption spectroscopy of various kinds, and I became interested in ultraviolet microscopy for examination of tissues. I recognized that the tissue components had quite different ultraviolet spectra, and I thought if we could examine tissues using ultraviolet light, it might have diagnostic possibilities.

Then, Din thought of not only using ultraviolet light, but translating in to the visible with color imaging. He spoke to Bob Conrad about obtaining a research contract to build what we called a "color-translating microscope." You'll see there's a publication on this (5). We got a large contract with the Office of Naval Research, worth many hundreds of thousands of dollars, to build the color-translating microscope. One of the reasons we perhaps got that was because Bob Conrad was ill with leukemia. One of the most poignant days of my life was when I visited Bob in the hospital in New York. He said, "When are you guys going to finish that microscope, so you can help me get better?" But we did have that to keep the research going, and we had a few other research contracts.

At the same time, Din was beginning to work on instant photography, with which we helped, but the company wasn't in good financial shape; we were down to about two-hundred people. I wrote a memorandum, which I think I still have, asking the company to consider commercializing its research capabilities, in addition to developing commercial products. The title of the memorandum was, "What is this Research Business?" It was a lead balloon if there ever was one. The most influential member of the board of trustees, Julius Silver, shot it down. He said, "You'll never make money on research. The only way you make money is by building products that you can sell." So

that didn't fly. I mention that, not because I didn't like being said "no" to, though I don't, but I was thinking along research lines about how research could be used industrially.

Once the idea of instant photography was expressed and the development program implemented, the main efforts, by far the largest proportion of the efforts in the company, went to the development of the instant photographic process. The company made a big financial bet on it. That was the period where the company tried to get patents in the field, and it was clear by about 1947 that we would be able to produce a black-and-white, or sepia color photo, as it was at the time, almost instantaneously. There were still many problems with the picture. For instance, it wasn't very stable, it didn't have all the photographic qualities we had hoped, and the pictures curled up. [laughter] You probably remember some of them.

BOHNING: I bought a Polaroid camera in 1957. It's a little later, but yes, it still was early, and I remember some of those problems.

BLOUT: I don't remember exactly, but I think we began to sell cameras in 1951 or 1952, and suddenly the company had a new lease on life.

A significant thing happened around 1947. When we first realized that black-and-white, instantaneous photography was possible, Din challenged, "Now we've got to begin thinking about color." We did. There was a very inventive person in the Land-Edison mode of invention and creation there, old [Howard G.] Howie Rogers; he's still around. He was the one who thought about photographic processes, and I was the one who thought about photographic chemicals; especially colors and spectroscopy.

We began considering how we could form color images, which gradually evolved into the use of dye developers; the combination of a color-forming reagent, color-enhancing reagent, and a chemical that resolved the image differentiation, silver halide emulsions, and the image intensification of the silver multiplication process. We gradually began to work on the dye developer idea after many false starts.

[END OF TAPE, SIDE 3]

BLOUT: We began making various combinations of dyes and colors, and built up a large chemical research group of maybe forty or fifty people, during the period from 1947 to 1953. Soon after, we began having success producing one-color images. I'll skip ahead to 1954, when we were able to produce three single-color images using dye developers. We knew they were stable dyes, and we were on the road to color. Further, I knew that we had essentially solved the color problem. So I did what I had never done before in my life at that point. I went out and borrowed twenty-five thousand dollars and

invested it in Polaroid stock. It took eight years before color photography was a reality in the market, but I felt we could do it at that time.

Many other things happened from 1947 to 1954. First, my interest was rekindled in the academic world. Second, Joan's brother became interested in Polaroid. Third, I became associated with Bob Woodward. All of these things are interrelated, and they're all pertinent to this kind of an oral history.

Let's start out with my interest. Maurice Pechet was one of the people who attended Harvard while I was there. He worked for Louis Fieser, and was working toward his Ph.D. He decided he wanted to go to medical school, and went to Harvard Medical School after he got his Ph.D. Maurice and I were never very close, but he'd heard about my work in spectroscopy and on the color-translating microscope. He had, as a pathology professor here at the medical school, a man named Sidney Farber. He told Sidney Farber about it, and Sidney invited me to come over to Children's Hospital [Medical Center], where he was based, and set up a spectroscopy laboratory. He said he'd buy the equipment because he thought it would be useful for diagnosing children's diseases.

When I was over there starting to do some spectroscopy with tissues, Bob Woodward and I were still talking. Bob was thinking of how one could synthesize proteins. I didn't know anything about proteins, but he came across this idea using n-carboxyanhydrides. As it turns out, they were discovered by [Sir Rubert William] Boyce many years prior to that time. Indeed, one could polymerize them, and Bob saw the possibility of polymerizing them to form peptides. He envisioned making proteins out of them.

I became intrigued with the idea. Having been at Children's, I began to meet other physicians in the area. One of them was a man named Jack [Jacob] Fine; a professor of surgery who knew the problems with trying to treat patients in shock. When I told him I was considering polypeptide research, he asked, "Would they possibly be useful as a blood plasma substitute?" Not knowing anything about it, I said, "There's always that possibility." He suggested I apply for a research grant with the Army, where there was a large blood plasma program. I applied and got a research grant, which permitted me to begin making synthetic polypeptides at Children's. I was still running a large chemical research group at Polaroid during that time, so I spent my late afternoons and evenings making polypeptides with a research group over here.

BOHNING: How big was the group?

BLOUT: It started out with two people, and it ended up at about eight. It was initially supported by the surgeon general of the Army. Sidney Farber got a lot of publicity for us with his great plans for our involvement in cancer diagnosis and treatment. He began to collect funds to build a new cancer-oriented building, named the Jimmy Fund Building.

According to Sydney, I was to be a keystone of that building, and given a half a floor of laboratories [the building was four floors]. I was also to be a professor at Harvard Medical School.

This was all in the early 1950s, while I was busy heading the chemical research group at Polaroid, and trying to make color a reality. Having both a laboratory at Children's as part of Harvard Medical School, and a large research responsibility at Polaroid, I was a busy young man. That was one aspect of what I wanted to tell you about, to get us close to the Harvard situation.

The second aspect is in regard to my brother-in-law, Jack Dreyfus. He was a Lehigh [University] graduate, very bright, and one of the two people I've known who I'd say was close to a genius; Bob Woodward being the other. Jack became intrigued with Polaroid after I joined the company, as photography was becoming a reality. He was intrigued with the instant photography, but thought the executives at Polaroid were poor business people. Consequently, he became intrigued with Polaroid from a financial sense. He and I used to talk about that all the time. He invested in Polaroid stock, and of course, I started to invest when I was reasonably sure that color was going to come out.

Then I also did another thing which had a great influence on my life and the lives of many other people. I wrote memoranda to certain members of the board of directors suggesting that Polaroid ought to have a stock option plan. At first it was turned down, and then it was addressed. As a result, a stock option plan was developed and implemented with key employees. I got a stock option in 1957 or 1958. So did Charles Mikulka, and [William J.] Bill McCune; the engineer who later became the president. I don't know how I did it, but I convinced them to give an option to Bob Woodward; technically, we made him an employee. Initially, they weren't worth anything because the company was having troubles with the black-and-white film. The company was not making much money, but the potential of color was there.

Our success in the research lab got me interested in our money making potential. To make a long story short, by 1958, I was made a vice president, Charlie Mikulka was made a vice president, and Billy McCune had been a vice president. Therefore, all of the executive officers received stock options when the stock was quite low. Subsequently, the stock increased over one-hundred times its value. It was one of those rare situations. All of us became, at least in theory, quite well off. By the time I was forty years of age, which was 1959, I had become, at least on paper, a millionaire. So that's another thread that runs through my life; Children's Hospital, Harvard Medical School, the development of color, and then the financial aspects of Polaroid.

By 1958, Land recognized that I was a good employee, and made me a vice president and a member of the executive committee. I was really in the corporate world. At the same time, I was spending half my time at Children's. In fact, I arranged to take a year sabbatical from Polaroid to spend it over here. The executive vice president at that time, David [W.] Skinner, convinced me not to take a year, but only half a year, for

which they'd pay my whole salary. It was only a small salary, but only took a half-year at his insistence.

During that time, Sidney Farber was supposed to secure my professorship at Harvard, which never happened because he didn't have a lot of influence. He meant well, but he was not highly regarded on the faculty, which I had no way of knowing.

That brings us to 1958, when I was being scientifically productive in the polypeptide field. By that time, polypeptides were being recognized as models of protein confirmations rather than as protein substitutes. I was publishing, had NIH support for my work at Children's, and was beginning to be recognized scientifically for my work. At the same time, I began to think, "What am I doing at Polaroid? Do I want to spend the rest of my life at Polaroid?" By 1960, I had more or less decided that I'd rather try my hand at a new career than be one of the competitors to succeed Land as president of Polaroid. So I let it be known discreetly among a few friends; Bob Woodward, Gilbert Stork at Columbia, Alex [Alexander] Rich at MIT; that I was thinking of leaving the industrial world. I got three job offers: one from Columbia, one from MIT, and one to be a professor in biological chemistry at Harvard Medical School. When I told Land that I was considering the move to Harvard, he said, "I knew I couldn't keep you at Polaroid."

I had some very good colleagues when I was at Children's, in the Jimmy Fund Building. For example, Carolyn Cohen is now a very distinguished biophysicist at Brandeis [University]. There was also Arthur [K.] Solomon, who was in the medical school, had recognized my abilities, and asked me to lecture in the biophysics program. I actually spent time teaching in biophysics, and Solomon had arranged for me to be a professor of biophysics. However, being a chemist at heart, though I loved the biophysical aspects of the work, I felt I'd be better off in biological chemistry.

They really welcomed me. I still remember the letter [Eugene P.] Gene Kennedy, the chairman of biological chemistry, wrote to me. I also met with the dean of the Medical School, George Packer Berry. In addition to working in the prestigious atmosphere of Harvard, I was offered an excellent salary.

Let me go back a step. Living with Sidney Farber wasn't easy. He was very bright, but also very emotional. He took it very hard that I would not stay at Children's and leave Polaroid during the 1950s, even though he couldn't give me what he'd promised, namely a professorship. I remember planning to tell him how I upset I was with him, before Lou Hodosman calmed me down. I never really told him, but I wanted to tell him how upset I was.

[END OF TAPE, SIDE 4]

[END OF INTERVIEW]

INTERVIEWEE: **Elkan R. Blout**

INTERVIEWER: **Arnold Thackray**

LOCATION: **Harvard Medical School**

DATE: **13 September 2002**

THACKRAY: Let us begin where your previous oral history came to an end, with Polaroid (1).

BLOUT: I want to make only a few additional points. First, concerning the relationship between Polaroid and Eastman Kodak [Corporation], there was a series of monthly meetings between the two organizations during the development the color film. The meetings were held alternatively in Cambridge and in Rochester, and were attended by groups on both sides, although we learned to keep the meetings small in order to get things done. Bill [William J.] McCune and I, as Polaroid's key staff, attended a meeting in Rochester. We met with Rudy Damschroder, Arnold Weissberger, and Henry Yutzy, Eastman Kodak' s key staff members, who were involved with the chemistry of photographic film.

We were very candid. We told Kodak about the development of the chemicals for instant photographic color process, and Kodak commented on our work. However, Kodak did not provide seminal contributions to the process. The seminal contributions came from Polaroid, though Kodak came up with the eventual process for making instant photographic color film. In any case, our meetings were very useful. The collaboration was mostly in two areas: the chemistry of color photography and the production of film. But as I said, I never felt that Kodak made fundamental scientific contributions to the process.

THACKRAY: Eventually there was litigation. I am surprised that the sharing of ideas was possible with those two groups. It seems obvious that Polaroid was working in an area that was of interest to Kodak. How did the companies begin their friendly conversation?

BLOUT: Edwin [H.] Land knew some key Kodak staff on a one-to-one basis, mainly through his work in Washington, so he was on neutral ground. Land's connection got us into that one-on-one conversation. I don't know why Eastman Kodak helped us; maybe because we contracted with Eastman to make color film. I'm not certain whether Kodak had considered taking over Polaroid or the instant processes business eventually. In any

case, the only people who had faith in the project were Edwin Land, Bill McCune, and me.

THACKRAY: Did those monthly meetings continue while the product was being developed?

BLOUT: Yes, but the meetings abruptly ended when it became clear that Polaroid's product would be Kodak's major competitor. In 1976, Polaroid issued a patent suit against Eastman Kodak, which resulted in a huge settlement by Eastman Kodak worth nearly a billion dollars.

THACKRAY: As I understand it, you started a second career while all of that was happening. How did that come to fruition?

BLOUT: I was offered a position at Polaroid through the chance recommendation of Bob [Robert B.] Woodward. Bob and I remained friends and scientific colleagues while I was at Polaroid. After seven years at Polaroid, I began to work on a color microscope, which became of interest to the medical school. Bob became interested through a chemist colleague of mine in the department of chemistry at Harvard [University], named Maurice Pechet. He suggested I meet with Sidney Farber, just as Bob Woodward had suggested I meet with Land. So, I met with Sidney Farber in 1949 and we hit it off. I had been at Polaroid for seven years, and I was looking around for something more to occupy my time and interests.

THACKRAY: Where were you living at that time?

BLOUT: I lived in Cambridge, and eventually moved to Belmont. In my spare time, I was working at Children's Hospital [Medical Center], in the old Coolidge Laboratory. I also continued my work at Polaroid's Cambridge location on 730 Main Street.

THACKRAY: Was it through your Harvard connection that you were able to meet so many influential people?

BLOUT: Yes. Because of that connection I was also asked to give a lecture to the Harvard department of biophysics and biochemistry by Arthur Solomon [an assistant professor of biophysics]. I became a research associate in pathology at Harvard Medical School in 1950.

THACKRAY: Were those connections all tied to dyes and color research?

BLOUT: When I worked with spectroscopy, I studied dyes. Then, I met Dr. Jack Fine, chairman of the department of surgery at Beth Israel Hospital, who was interested in researching shock in surgical patients. I thought about Fine's work and applied for a grant from Army.

THACKRAY: You were a pathology research associate from 1950 to 1952, and you also worked at the Children's Cancer Research Foundation; but there is a gap in your employment history from 1952 to 1956, when you again take up pathology as a research associate. How and where does your shock research fit in?

BLOUT: I started with the shock research in 1950.

THACKRAY: But it appears as if there is a four-year gap in your employment.

BLOUT: There wasn't a true gap. I worked day and night, mostly nights, until Polaroid accepted that I wanted to do something else. In fact, Polaroid offered me a sabbatical leave for one year, during which I started to work on peptides and polypeptides.

THACKRAY: Did you ever have the opportunity to see your wife and family?

BLOUT: Not much, regrettably.

THACKRAY: You were in love with science.

BLOUT: Yes, I was. I was ambitious.

Going back to Children's, when I passed my fortieth birthday, I decided that I wanted to go back to the academic life. First, my *alma mater*, Columbia [University], wanted me to come back as a professor, then Massachusetts Institute of Technology [MIT], and finally, Harvard Medical School. By then, I was forty and had become a millionaire, which allowed me to make the financial transition from Polaroid to Harvard.

THACKRAY: Had you achieved that status from your work at Polaroid?

BLOUT: Yes. I had suggested that Polaroid offer stock options to their senior staff. The Polaroid stock and its value made my fortune. At that time, Polaroid stock was in its hey-day because the company was about to go public with its color photography product. I was grateful to have had the commercial-industrial experience at Polaroid because it influenced the rest of my life. Although, it was my research and academic work that got me the three professorship offers.

THACKRAY: In what way did your Polaroid experience influence your future career?

BLOUT: Polaroid made me aware of the real world. And because of Polaroid, while at Harvard, I set up organizations and attempted to build companies. I never would have done that had I not been at a very exciting industrial company, namely Polaroid, in the 1950s.

THACKRAY: Why did you want to re-enter the academic world?

BLOUT: I found the academic world intellectually exciting. Though it was exciting to build new products at Polaroid, the satisfaction gained from discovering new phenomena was totally different.

THACKRAY: Were your colleagues of a similar mindset?

BLOUT: Not at that time. I was ambitious and I worked hard. [laughter]

THACKRAY: Please, tell me more about your experiences at Harvard.

BLOUT: I came to Harvard in 1961, roughly. I was a full professor at the Medical School and was expected to teach. I taught in both the biophysics program, and the department of biological chemistry, where I was housed. My teaching was satisfying in some ways. I remember my initial lecture at Harvard Medical School, after I was made a professor. I lectured on the structure of myoglobin and hemoglobin. My lecture had been based on recent work by John [C.] Kendrew and Max [F.] Perutz; the students loved it. I knew the subject, I was obviously enthusiastic, and the students indicated their appreciation by applause at the end of the lecture. In fact, it was probably one of the best lectures I gave in the formal courses. That lecture got me started, re-energizing my interest.

As I said, at Harvard I was expected to teach as well as to do research. I had already started on polypeptide and peptide research, which was strongly supported by the National Institutes of Health [NIH]. In those days, one was almost assured of receiving a grant if one applied for it. It was a very lush period. It was the period when science was coming into its own.

I was fortunate. I felt appreciated at Harvard. After having worked there for a year, the dean asked if I would become chairman of the department of biological chemistry. I replied, "It's too soon. I'll consider taking that position next year." Then, in 1965, I became chairman and held that position for four years. I felt even more accepted into the academic world because, as chairman, I could meet with other professors and discuss both science and certain administrative problems.

THACKRAY: Did your position bring you back into conjunction with Woodward on projects?

BLOUT: Bob and I were friends since early in my career. When I was being considered for a professorship, I knew he was consulted. I knew he wrote a letter about me, but I never saw the letter. When stock options started at Polaroid, I felt that Bob had made such a big contribution to our science that I went to Din Land, the president, and asked, "Can we make an exception and give Bob Woodward an option?" As the stock grew in value, Bob's life became increasingly comfortable. After that, Bob became a member of the board of directors of Ciba Geigy [Corporation].

[END OF TAPE, SIDE 1]

BLOUT: I devoted my life to my work at Harvard starting at age forty. Gradually, I was accepted in to academic society. In fact, just before I turned fifty, I was elected as a member of the National Academy of Sciences [NAS], which had a large influence in my life. I enjoyed being associated with my colleagues at Harvard, but after I was elected to the Academy, I enjoyed being associated with my colleagues at the National Academy even more. Indeed, my colleagues began to think of me not only as a scientist, but also as someone who was interested in the real world. I was initially asked to join the finance committee of the Academy. I was nominated as its treasurer, re-elected twice, and remained treasurer for the maximum number of years; twelve.

My service as treasurer reinforced my interest in finance, and allowed me to do a few unusual things at Harvard. One was to set up a company in 1974, in which I was joined my some of my academic colleagues. It was named "CHON," being the acronym for carbon, hydrogen, oxygen, and nitrogen. [laughter] The CHON Corporation's purpose was to search the academic world for projects that were commercially relevant,

and then give academics the chance to participate in commercial development as a result of their own research.

CHON had an excellent board of directors. I was the president, and Bob Woodward was on the board along with many other individuals of equal interest, though I won't say equal academic status. The company's founding was welcomed in academic circles because, at that time, most academics did not have industrial connections.

In addition to founding CHON, a profit motivated organization, I also established a non-profit organization named Bay Biochemical Research [Incorporated]. The company was established on Buzzard's Bay, and reflected my interests in both biochemistry and marine life.

THACKRAY: As a non-profit company, did it seek NIH grants?

BLOUT: Yes.

THACKRAY: CHON sounds like it was a biotechnology company before biotechnology was invented.

BLOUT: That's right. We had a lot of foresight. CHON was successful in stimulating ideas among certain professors, though we didn't have a serious interest in making an industrial company. We didn't have the competency or dedication necessary to make such an organization succeed, so the company was terminated after 10 years. CHON did some very interesting work, and brought us in touch with a lot of interesting people, including Pierre Crabbé, a chemist working at Syntex [Corporation], in Mexico.

In retrospect, I've noticed connections between almost everything I did, though those connections are not always obvious. The important point was that I wanted to keep working. I was always looking for areas, in either science, industry, or both, where I could make contributions.

THACKRAY: During your forties, how many hours, and days, were you working per week?

BLOUT: I worked nights and weekends. I worked hard and enjoyed it because it created a whole other world of people. When I went to Harvard, I felt strange and out of place, but, eventually, I was welcomed there, too.

THACKRAY: You weren't just chairman of biological chemistry department; in due course, you became dean of the Harvard School of Public Health.

BLOUT: That's another part of my life at Harvard. I became academic dean at the School of Public Health because of my good friend, and Harvard dean, Howard [H.] Hiatt. Howard is a brilliant person, but he didn't appreciate some of the professors at the School of Public Health; in fact, he alienated some of them. Howard wanted an associate in the academic community who could relate to the professors, while he focused on other aspects of school life.

THACKRAY: Were you making major scientific contributions while holding those positions?

BLOUT: I was fortunate. Not only was I recognized as a member of the National Academy, but I was also able to undertake projects related to science; such as the creation of CHON and Bay Biochemical Research. Those were not ordinary undertakings. The aspect of my life, which developed from my Harvard experience, was my membership with the National Academy of Sciences. I became treasurer in 1980. I subsequently became a member of the executive committee of the Academy, and I had the responsibility of chairing the internal affairs committee and the finance committee.

THACKRAY: What was the internal affairs committee?

BLOUT: The committee was concerned with making sure the Academy's actions were appropriate for an academic organization. At some level, we approved projects to be taken on by the National Academy. As a member, my major contribution was as treasurer. As it turned out, I was very comfortable with Frank Press, the president of the Academy. He and I had the self-appointed job of increasing the endowment of the Academy.

When I became treasurer of the Academy, the endowment was twenty-five million dollars, which was modest. The Academy relied on directives from the Congress and from other areas of government to do its work. Frank and I decided it would be useful for the Academy to initiate its own projects in addition to undertaking government sponsored projects. To realistically accomplish that goal, the Academy needed additional income and endowments, which is why we set about increasing the endowment. By the time Frank's and my terms had ended, the endowment had been quintupled, being worth one hundred twenty-five million dollars. Consequently, the Academy could initiate its own projects rather than waiting for the guidance of the government.

THACKRAY: How did you accomplish that feat?

BLOUT: We accomplished it by working with people who recognized the Academy's potential, and who were willing to finance its growth. Some of those people were presidents of large corporations; others were leaders in the foundation world. In all, it was a satisfying endeavor.

THACKRAY: It seems like quite a highly involved undertaking.

BLOUT: It was. Frank Press was highly valuable. We also had a great ally in Dr. Samuel [O.] Thier, the president of the Institute of Medicine, who was quite verbal with individuals at other foundations. Thier helped to raise some of those funds. As you probably know, Sam Their became the president of Brandeis University after he left the Academy, and more recently, he was the president of Partners HealthCare System, Incorporated; a large medical organization in the Boston area. So, again, I have known people who are not only intelligent but accomplished, and Sam Thier fits very well into that category.

THACKRAY: Were there one or two particular donors who were more important in this effort with the Academy?

BLOUT: The major donors were foundations and certain organizations, such as IBM [International Business Machines Corporation]. As I mentioned, that work allowed me to associate with a very interesting group of people who were neither in the academic world as professors nor in the industrial world, but were in between in the foundation world.

THACKRAY: How much of the endowment growth was due to a better investment policy?

BLOUT: That was a period when investment yielded dramatic results. The growth in the endowment was roughly 50 percent because of donations, and 50 percent because of wise financial investment.

THACKRAY: What was the key in terms of wise investments?

BLOUT: On that side of the street, the finance committee had the responsibility for making investments in "big cap" areas. We worked with various advisors, finally finding a couple of dedicated, highly valuable young people.

THACKRAY: Was the finance committee itself comprised of academic scientists?

BLOUT: Fortunately, two academic economists were among the academic scientists in the finance committee, one of whom was from The Wharton School [of the University of Pennsylvania]. The second, Paul [A.] Samuelson, was from MIT. Paul and I had known each other for many years, and had served on other committees together. Paul did much to guide our investment philosophy.

It's interesting how things come around in life. When I was the academic dean, Paul's oldest son had finished medical school and wanted to work in public health. I was influential in helping him get the right position. Those kinds of connections happen all the time. The most unexpected consequences come from unplanned events.

THACKRAY: Since the Academy's assets were growing and you were chair of the internal affairs committee, what ventures did you launch, or encourage, as a result of the Academy's newfound independence?

BLOUT: There were several, but I'll just mention one of the most successful. As a result of the academic connections we had, we realized that age would be a problem for the world. Long before the National Institutes of Health had recognized the problem, we at the National Academy sponsored a study, with our own funds, on age and immune deficiency diseases. Our study had a great deal of influence in convincing other people to do the same.

THACKRAY: Knowing what you know, if you had absolute authority, how would you have changed the Academy?

BLOUT: If I had absolute power, I would have increased the Academy's endowment even more than we were able to do, so that the Academy's work, in larger part, would have been entirely independent of what the government thought was important. The relationship between the Academy and government is very close, but the Academy, in the 1980s, had become a large organization. To supply funds for the organization, the Academy had to go to the government and stimulate them to ask the Academy to do things. It was an organizational arrangement that worked, but too often the Academy was asked to engage in trivial programs rather than concentrate on major problems.

THACKRAY: What were the impacts of the Academy's presidents on the future of the Academy?

BLOUT: Frank Press, as I said, became a personal friend. In fact, I knew Frank when we both lived in Belmont. When Frank was elected president of the Academy, it was natural that he talked to me about intimate things. Frank is a brilliant scientist, and as such, he contributed a lot to the Academy. But, in addition to being a brilliant scientist, Frank knew how to stimulate an organization. He spent a lot of his time reorganizing the Academy and the group that worked directly for the government; the National Research Council [NRC]. Frank reorganized the National Research Council, but I don't think he accomplished what he wanted; that is, I'm not sure the NRC is currently accomplishing all it can. Frank's hope was to have major projects that were independent of the government, and national or international in scope.

I benefited greatly from my work with the NRC as treasurer of the NAS. The position also introduced me to many important people from its sister academies; namely the Royal Society, the Soviet Academy of Sciences and, to a lesser extent, some of our Chinese colleagues. Our interactions involved both work and play. For example, when we met with the Royal Society, we stayed at a major university like Cambridge [University] or Oxford [University], or at a very interesting location, like Leeds Castle. In any case, we always received "royal" treatment because we were officers in the Academy, and I was very grateful for it.

THACKRAY: How is the president of the NAS selected?

BLOUT: It's usually done by a committee composed of National Academy members. As with most committees, there are a few very persuasive members who sway the rest of the committee one way or the other. It's a great honor to be president of the National Academy of Sciences, and it's not the sort of thing one applies for. Really, the nominating committee is charged with looking at the membership of the Academy and seeing who among the members of the Academy would make a suitable president after the twelve-year term was up; which I had and Frank Press had.

Almost every member of the nominating committee had his own candidate because it is such an honor. I argued that we should look among the Academy's younger members for our next president. Although Frank Press was a great scientist, and he had done well as president of the Academy, I felt the Academy was becoming slightly inbred. I won't tell you who was suggested, but they were very competent people and, at a certain point, it wasn't clear who would get the nod.

I made a strong endorsement for Bruce Alberts, one of the Academy's younger members. The committee finally agreed it would be good to have a younger person, and

that Bruce was an intriguing possibility. He was suggested. I think the nomination surprised him. He had never planned to be president of the Academy, but after a while, it became clear that he was more intrigued with the possibility, and he agreed to be nominated.

I knew Bruce as a biophysics student at Harvard. He actually did his degree with Paul Doty, whom I've been friends for 60 years. I knew Bruce Alberts from the time he was a student until he was nominated as president of the Academy. It isn't clear whether he will be a great president yet. It is clear that he has grown in his career as president, and that he has brought new things to the Academy that are different from Frank Press's contributions. He has brought his experience and knowledge of molecular biology, as well as his dedication to education. The molecular biology experience was directly useful. His dedication to education is clear, though I think many other scientific academies have encouraged his dedication more than NAS.

One of the good things about the Academy is that it attracts imaginative people, and Bruce is certainly an imaginative, hard-working person. His interests in education have been very effective in guiding the Academy, and allowing the president to influence the course of science in our society. Though he's still interested in education, Bruce's interests have turned towards the Academy's international affairs. He's trying to get the Academy to lead similar organizations in other countries; to make them more useful to other countries and to the world. His goal will be very difficult to attain because other societies are very different from ours. Our society is much more focused on doing things than the societies in other countries. Although I do respect the Royal Society, it doesn't excel at <u>doing</u> things. [laughter]

THACKRAY: Is the hope not so much to launch projects on global warming or international issues, but rather to get the Hungarian Academy of Sciences to behave differently, as it were?

BLOUT: Right. And the Indian Academy, and so forth.

THACKRAY: Those aren't small tasks.

BLOUT: They are not small tasks, but Bruce is putting a tremendous effort into his work because he feels reorganizing and guiding those other organizations will benefit the global scientific community.

THACKRAY: Education is a vast sea. How would you measure and evaluate the change that he's been able to make? Is there some unqualified success?

BLOUT: He's made a good attempt to change our educational system, but has not yet been successful. It's hard to change the methods of the stakeholders, mainly the elementary and high school teachers who have a very strong position in our society. Generally, they're not amenable to progress. What the Academy has done in this area, which I think is very important, is to conceptualize standards for each school and each grade. Massachusetts, for example, is finally accepting those standards. Further, through Bruce's work, we've realized that there were very few standards in education until recently. Hence, they are just now becoming more useful.

I continue to be influenced by my work at Harvard, in the National Academy, and in the Food and Drug Administration [FDA], which we haven't talked about and we'll come to. In the last month or so, I've realized the importance of exposing pre-college students to science. Consequently, I've begun trying to expose both young and old students to science through the National Academy. I've noticed that exposing students to science at lower-grade levels has been received well by many people, so I hope this is one way that I may contribute to society.

THACKRAY: Can we go from the National Academy to the American Academy?

BLOUT: Yes. I was elected to the American Academy in 1954 or 1955. It has always been a very sleepy organization. The National Academy has a clear mandate to serve the government, but the American Academy has had no clear purpose. It had the mandate to talk to itself. As a result, even though there were good people in the Academy, and it was considered an honor to be a member, the Academy itself did little, if anything, to change or support our society. I was actually asked to be their treasurer while I was treasurer of the National Academy, which I declined to become until after I finished my term in the National Academy. Then, I was elected treasurer and began to work with the American Academy. One of the pleasures of working at the American Academy was its new building, which was funded by Edwin Land. It's a beautiful building, but it isn't occupied very much, unfortunately.

THACKRAY: Yes. I'm a member of the American Academy, and I've never been there.

BLOUT: That's typical. [laughter] The American Academy is an organization without a mission. Not because it hasn't looked for a mission, it just hasn't been successful. The American Academy was founded long before the National Academy, but since then it has only succeeded in congratulating itself. I'm always pleased to see how people enjoy being elected to the Academy, but the members have yet to focus the Academy to benefit society in some way. Even the American Academy's beautiful building has yet to attract people willing to devote themselves to the American Academy. There's very little

devotion, whereas with the National Academy, people are devoted. If you ask to serve on a committee of the National Academy, you almost always accept. Even if you're not a member, it's considered an honor. I guess I should mention that you don't get paid for anything you do for the National Academy. You work for the honor.

THACKRAY: What would you do to change the American Academy?

BLOUT: Try to find a mission. I think the people there, in general, are content to just hear each other speak once a month. In addition, the Academy is poorly financed. There's no money there to do the necessary things to make it meaningful. Its endowment is a tenth of that of the National Academy, and the National Academy has the sponsorship of the government. What do you think could be the mission of the American Academy?

THACKRAY: As a member, I would love it to have a mission. I hadn't thought about it that way, but one reason that I haven't gone is precisely that sense from a distance that this is a self-congratulatory talking shop. Though I was honored to be elected. [laughter]

BLOUT: That's exactly it.

THACKRAY: Can I go back to Harvard? Is there more to say about the School of Public Health?

BLOUT: As I mentioned, I became affiliated with the School of Public Health through its dean, Howard Hiatt, and his "troubles" with the faculty. I was challenged by that fact, and when Howard suggested I become the academic dean, I was ready to accept. I found the challenge of working with the faculty to be real, but I also found that the faculty was not appreciated by areas outside the world of public health. They were more of a self-congratulatory organization like the American Academy. They didn't consider undertaking larger projects until Howard Hiatt began developing them. Those projects are now being more strongly developed under the leadership of Barry Bloom.

I think leadership is very important in life. I saw it at Polaroid with Edwin Land, and at Harvard with President Derek Bok. I've learned that leadership doesn't come when one is given a leadership position. Leadership can be very subtle and frustrating, but if one has a clear plan for the future, and the drive to succeed, strong leadership will result. For example, Edwin had the vision to lead Polaroid's development of instant photography. Something similar could happen soon at the School of Public Health.

THACKRAY: You came into a very complicated, messy situation there. Describe the results of your leadership on the School of Public Health.

BLOUT: I gave the School of Public Health a direction, namely a concern for global health. It is a very complicated area, but the question of leadership continues to intrigue me.

THACKRAY: Vision alone won't do.

BLOUT: No, it won't. Howard had a vision, but unfortunately, he didn't have leadership. He had vision, and attracted people of intellect, but he couldn't make the School a force in the world. The end was clear, but the countries means to that end were poorly defined. Moreover, he needed financial backing to accomplish his goals, which was similar to the early days of the National Academy. One needs financial backing to do anything in the world these days. I'm sure you've recognized this at the Chemical Heritage Foundation. Without financial backing, most projects are unable to fulfill their potential.

Our new dean, Barry Bloom, has the intellect to be the leader, but whether he can get the necessary support is still unclear. It was very exciting, being at the School of Public Health, because it was, in a way, much less hide-bound a place than the Medical School. One could try new things. For example, as academic dean, I saw the need in public health to emphasize basic science. I set up a division of biological sciences in the School of Public Health in an attempt to attract outstanding faculty, outstanding students, and outstanding post-docs. The division of biological sciences is beginning to be a great influence, both inside and outside of the school. What we haven't done, which nobody has done, is attract sufficient resources to the School of Public Health. You see, the medical school has a big advantage. It teaches the people who treat people, and it promotes "grateful patients," so you always have a great source of wealth.

THACKRAY: You continued at the School until the age of seventy. Was that the Harvard retiring age?

BLOUT: Howard Hiatt had resigned as dean, and I didn't have the rapport with Harvey Fineberg that I had with Howard.

THACKRAY: I want to pause and characterize your different careers. You were first trained academically, and then you were an industrial researcher, which, to a first approximation, ended with Polaroid. Your next career was academic researcher. What termination date would you put upon that career? Has it terminated?

BLOUT: I'm still interested in research. I'm not doing as much research, but I'm still very interested. As an academic researcher, I've been able to do things in the industrial sphere that I couldn't have done without my academic background. For example, I was the founding member of Enanta [Pharmaceuticals, Incorporated], which is currently up and going, and soon will have products.

THACKRAY: Describe the origins of the Enanta, Incorporated.

BLOUT: It started about twelve-years ago when three faculty members at the medical school came to me and asked, "Elkan, we want to found a company. Will you help us? We don't have a clear idea of what we want to do, but we want to found a company." Having thought about it, I replied, "I agree. There are things that could be done." We decided to work with viruses, so we named the company Novirex [Company]. We had been struggling, without success, to find a place for the company, when a scientific advisor suggested a new tack; making compounds for therapeutic purposes related to currently used compounds.

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BLOUT: This was a vision of a scientist who was on the scientific board of Novirex. The whole company changed character and began receiving funds from the outside world. It's currently pulling in forty-million dollars, and is beginning to produce compounds that we think will be very useful in the therapeutic sense.

THACKRAY: Are you a member of that company's board?

BLOUT: I was a member of the board originally, but I stepped down when I turned eighty because other venture capitalists wanted to be members. I'm currently a founding board-member emeritus. I don't vote at the board meetings, but I go to them when I can, and have some influence.

THACKRAY: Is that company involved with clinical trials, or do they just make compounds?

BLOUT: The first stage is synthesizing compounds, and the second stage is clinical trials. The second stage takes much time and effort, as you know.

THACKRAY: Are there some products in clinical trials now?

BLOUT: There are two potential products that are almost ready for clinical trials. The first part of a trial is to determine if a compound has any obvious toxicity or not. The second part is to find the areas where it has some therapeutic effect.

THACKRAY: Is that company in the Boston area?

BLOUT: Yes. It used to rent space from Polaroid. After it got to be about two years old, I persuaded a senior Polaroid scientist to join the company as president, and he was very successful.

THACKRAY: So how many employees does it have today?

BLOUT: It has about sixty to seventy employees, and it has spanking-new laboratories in Watertown, which were put up by a commercial company. But it started its life in the laboratories of Polaroid. [laughter] It's really amusing, isn't it? It started its life there. Because Polaroid was at a stage where it was shutting down, and here was a chance for them to use these facilities.

THACKRAY: What about IOCD [International Organization for Chemical Sciences in Development] and IIVD [International Institute for Virology Development]?

BLOUT: I mentioned to you that, when I was doing work for CHON, I got to know Pierre Crabbé, a visionary chemist who worked for Syntex and then started to work for UNESCO [United Nations Educational, Scientific, and Cultural Organization]. He wanted to help developing nations succeed through science, and in particular, through chemistry. He could see the idea of having an organization that he called the International Organization for Chemistry in Development [IOCD] . He set up this organization twenty-years ago; I was one of the founding people.

The IOCD has continued to do well. It has very good contacts with developing nations, and organizations in the United States and Europe that want to help developing nations succeed through science. It's not a very easy project, but it's currently being

undertaken. The IOCD continues to prosper. I'm actually now vice-president and treasurer, so I spend some time helping them.

THACKRAY: Does it have staff or volunteers?

BLOUT: It has all volunteers. It has one, I won't call him a paid staff member, but he's a retired chemist who devotes his time and gets a very small amount for doing the necessary administrative work.

THACKRAY: And IIVD is what?

BLOUT: IIVD is another activity. It's the International Institute for Virology Development, and it's a profit organization that tries to do new things in the area of virology. In particular, its main mission is to develop a really useful therapeutic vaccine for AIDS [Acquired Immune Deficiency Syndrome].

THACKRAY: That's not a small mission.

BLOUT: It's not a small mission, but we're trying. We have a very small staff, but it's a staff that's helping us try and achieve that mission.

THACKRAY: Did that begin in 1996? Were you one of the founders?

BLOUT: I was one of the founders, yes. It came out of people who were working in virology in another organization, and people who were at the medical school at the School of Public Health. It is an early-stage biotech.

THACKRAY: With how many people in it today?

BLOUT: Not many, three or four now. It's very understaffed. We're trying to work with developing nations in developing a vaccine, which some people feel could be very useful.

THACKRAY: What about the Affymax [Corporation] connection. Can you talk about that?

BLOUT: Affymax was set up by Alex [Alejandro] Zaffaroni, a very distinguished, interesting, imaginative person. It was his idea to develop a new company by bringing together talented people from the academic world. Soon after he succeeded in uniting a group of competent academics, Affymax was founded. The company worked on providing a means of recognizing DNA [deoxyribonucleic acid] by using the properties of DNA to bind to certain materials.

THACKRAY: *The Journal of Biopolymers* connects with those territories, doesn't it?

BLOUT: Yes, it does. The word "biopolymer" is derived from the word "polymer." We coined it when we first considered creating a journal devoted to polymers with biological properties and significance. We founded the journal with the help of Eric [S.] Proskauer, from Interscience Publishers.

THACKRAY: You continued that for 22 years, 1963 to 1985? Is that right?

BLOUT: Yes. Then we got out of it.

THACKRAY: Elkan, please describe some of your other activities.

BLOUT: Let me start out with my work as CBR trustee. The Center for Blood Research in Boston is a non-profit organization devoted to continuing the blood research initiated by E. J. Cohn, a Harvard professor. I was asked to be a trustee, and I served in that role for many years. Similarly, I am trustee and was a vice president of the Boston Biochemical Research Institute.

THACKRAY: What is that?

BLOUT: It's a non-profit organization of about a hundred people devoted to finding higher chemical substances that are of interest to the medical profession. The latest one is developing an anti-viral treatment for Alzheimer's disease. It was founded by a couple of Harvard professors, John Gergeley being the most prominent, in about 1973. I have continued to serve as trustee for all of these years. Again, it's one of those things I do; try and serve society in the broader sense.

Now the next item I wanted to talk about is the Marine Protein Corporation, which is quite a different activity that I was involved in during the 1970s. The company

was founded with the idea of propagating fish, as food, in tanks. It was the right idea, but it was before its time. It was possible to do it, but it was not economically feasible at the time, and I was asked to consult with them because of my interest in marine problems. It was the right idea but the wrong time.

The next item I want to mention is *The Big Drop*. It is a movie that was made in Mexico, at the instigation of Carl Djerassi, when he was working for Syntex Corporation. Alex Zaffaroni, Carl Djerassi, and I were all sponsors of that amateur movie, which was finished eventually, but was never shown commercially. It was one of those good ideas, but never shown commercially.

THACKRAY: It was a fiction movie?

BLOUT: Yes, a fictional movie. In addition, I also sponsored a fictional play in the 1970s, named *I Remember Mama*. It never got to Broadway. Some people remembered I had sponsored *The Big Drop*, so they asked me to consider sponsoring this play, which I did in a small way.

THACKRAY: So you made the right choice, going for the sciences and not the arts. [laughter]

BLOUT: I hope so!

In the sciences, some of the consulting things I've done include the Monsanto-Washington University research agreement, which was a very large agreement between the two institutions to cooperate in new medical areas. It was an agreement that was one of the forerunners of university industry agreements, and was very valuable to both Monsanto [Company] and Washington University. It was novel at that time.

I was also a member of the advisory council of the Princeton Department of Molecular Biology. It was something that was very close to my heart for over 10 years. I became a member because some of the chemists at Princeton knew me and had asked if I wanted to be on a biochemistry and chemistry advisory council. After two years of being on the board, it was transformed in to a molecular biology advisory council, which I then served on for 10 years. In retrospect, I hope I was helpful to the department in its decision-making capacity, and I hope my advice aided the department in selecting its new members.

THACKRAY: That was in 1974, and departments of molecular biology were very novel. All of it seems to have worked well.

BLOUT: It worked very well because we had a very vigorous chairman, Arnold Levine, who is now president of Rockefeller University. As I emphasized in some of my previous comments, leadership is important, and Arnold Levine provided leadership for the embryonic department of molecular biology. Now it's a very distinguished department. In fact, the recently-appointed president of Princeton University, [Shirley M. Caldwell] Tilghman, was a former member of that department. She's the first female president of Princeton.

THACKRAY: Yes. And non-Princeton graduate.

BLOUT: A non-Princeton graduate and a very scholarly person. She's very wise.

I consider myself very fortunate to have contributed to and been a part of so many diverse activities during my lifetime; all of which, in a broad sense, have been directed towards improving the environment and global scientific education.

THACKRAY: What is it that gives you the greatest pleasure upon reflection?

BLOUT: Upon reflection, one of the greatest pleasures in my life was having the opportunity to work with really talented, good people. I include among them Norman Simmons, who, with me, worked to apply circular diochorisms to biology. I also include Lubert Stryer; a student at Harvard Medical School who began working with me soon after I joined Children's Hospital. He graduated from Harvard Medical School, interested in biochemistry and biophysical chemistry, and went on to become a professor at Yale University. He then became a professor at Stanford University. He and I still talk quite often after nearly 50 years.

Another person I feel close to is Ephraim Katchalski Katzir. Ephraim is a very distinguished biochemist in Israel. He's made many contributions to molecular biology and, incidentally, spent 5 years of his life as president of the State of Israel. That's another aspect of my life.

A fourth person whom I've worked with and am very fond of is Henri Lenormant. He and I became good friends while he was a professor at the Sorbonne in Paris. We quickly developed a bond because we were both interested in peptides; and coincidentally, because he taught me how to enjoy the good life in France. I still have a connection with the Lenormant family, in that I am the godfather of his grandson, Charles-Henri Lenormant diMania. So, you can never tell when things will turn out well.

As you know, one of my major friends was Bob Woodward who unfortunately died at a premature age, but his memory is still present. Many people consider him the

greatest chemist of the twentieth century. Others consider him the greatest organic chemist, and having worked with Linus [C.] Pauling, I tend to agree with the latter. Pauling was a great chemist, with whom I served on various committees, and so forth.

THACKRAY: You must have had numerous invitations to follow other career pathways, to take other positions. Would you talk briefly about the roads you didn't take?

BLOUT: You never really know what the roads would have brought you if you had taken them. I was given the opportunity to serve as the director of several for-profit corporations, and industrial corporations. Of course, I did serve as the director or as a trustee of many non-profit organizations, but serving as director of a profit organization is quite different. One I served on not too long ago, a small company here in the Boston area, was a frustrating experience because the company had talented people in it and could have done much more if it had joined forces with another organization. Despite my attempts to convince the management, they wouldn't join the other company, which was frustrating.

THACKRAY: What essential differences do you see between being a director in a not-for-profit and in the for-profit?

BLOUT: The simple difference is that in a for-profit corporation, the bottom line is most important. It doesn't matter whether we can make or do something, only if we can do something for a profit. Successful corporations do it as a profit, but the unsuccessful ones, of which there are many, just stagger along.

THACKRAY: Where else might you have gone? You obviously have very considerable administrative talent that is always in short supply in the academic world.

BLOUT: I was offered the presidency of a very good academic institution. I thought about it for about ten microseconds and decided it was not for me.

THACKRAY: Why?

BLOUT: Because there were many things you had to do as president of an organization at that time that I didn't want to spend my time doing. Being nice to potential donors is an essential part of being president of an academic institution.

THACKRAY: What about the West Coast? Were you ever seriously tempted to leave this environment?

BLOUT: No, I was never tempted. I love, and consider myself lucky to live in the Boston area. We have four seasons each year, and we have intellectual colleagues that are world-class. Further, we have the environment, both intellectually and financially, which can be very stimulating.

[END OF TAPE, SIDE 4]

[END OF INTERVIEW]

INTERVIEWEE: **Elkan Blout**

INTERVIEWER: **Arnold Thackray**

LOCATION: **Cambridge, Massachusetts**

DATE: **22 November 2002**

THACKRAY: Elkan, please begin by taking more about Polaroid.

BLOUT: Yes. I've been thinking about it a lot. As you know, in the last couple of years, especially in the last year, it has gone down the tubes. I'd like to tell you about my life there.

I started as a chemist and then I worked on the color photography. In fact, my main job there was to make the concept of instant color photography a reality. It was very exciting to work at Polaroid with Din Land, even though we didn't have an awful lot of intimate, day-to-day activity. Regardless, he was very interested in the success of instant color photography. He and I never argued; we worked well together. We ended up with a large group of chemists at Polaroid who worked on the color photography process, and who also worked with certain aspects of the Kodak organization on that process.

I got great satisfaction out of my work at Polaroid, but not complete satisfaction. I think the reason was that Din Land, while being very supportive, was also very secretive. He believed in keeping things as secret as possible, which is the antithesis of many aspects of the academic world. Indeed, his secretive nature eventually drove me back in to the academic world. Din was an imaginative, charismatic leader when he wanted to be. He was also a son-of-a-bitch when he wanted to be. [laughter]

THACKRAY: In what sort of way?

BLOUT: In many ways, he was very demanding and imperial. I suppose some organizations need that drive to succeed, but it isn't necessary in the academic world. Nevertheless, I must say I really liked Din, regardless of our differences. I liked him because he was smart enough to let me do what I wanted, and he encouraged my work. He was very self-righteous in what he did, and wanted to get credit for everything he did. In fact, one of the difficulties of being at Polaroid was that he wanted credit for most of the things that everybody did, which created tension in the organization. Certain people left. Other people stayed and fumed about him.

One of the good people who left was Stan [Stanley] Calderwood. He just died within the last month or so. He left Polaroid over disagreements with Din, and ended up becoming a very successful financial entrepreneur in the Boston area. He made a hell of a lot of money, and gave a good deal of it to the Museum of Fine Arts [Boston].

THACKRAY: What was his role at Polaroid?

BLOUT: At Polaroid, he was responsible for public relations, and he was very good at his job. He left Polaroid because he didn't like the way Din did things; the way Din demanded things of people. Calderwood decided that he would either have to be the president of Polaroid or leave, and since he wasn't going to be the president, he left.

THACKRAY: Can you talk about Polaroid after you left it and the more recent career of Polaroid?

BLOUT: I left Polaroid when I went to Harvard Medical School around 1961, though I remained a Polaroid consultant for the following 25 years. My best relationship was not really with Din, but with Bill McCune, who succeeded Din as the President and CEO of Polaroid. Bill McCune is still alive. In fact, he and I try to see each other once a week or once every two weeks. We're two of the few people who remember Polaroid as it was. He, like me, admired Din, but he had his difficulties with him.

Din's ego was great. He wanted to be recognized for what he did. In the latter part of his life, he was not so much interested in Polaroid as he was in the idea of working out the physics, as he called it, of color vision. He had some original ideas, but they never gained general acceptance, so he didn't find it very happy in the last ten years of his life.

Polaroid fostered many new organizations, except those that Din wanted me to foster. Those were usually very personal. He wanted to foster the American Academy of Arts and Sciences. He became president in the 1950s, and he tried to change the Academy in very subtle ways and by giving them a major gift, which resulted in a new building. He wanted the Academy to be more useful to society, as I do, but neither he nor I succeeded. I think it's the aim of many people, but nobody has really succeeded.

In any event, my life a Polaroid was interesting, challenging, and financially rewarding.

THACKRAY: In retrospect, where do you think Polaroid went wrong?

BLOUT: Polaroid went wrong by letting Din Land dominate business decisions. He used his personal "scientific insights" to lead the company. His original insights into the plastic polarizer and into instant photography were excellent, and resulted in Polaroid being a great company; but his later insights into instant movies, and other ideas that Polaroid invested in, were wrong. They eventually led to Din's downfall. Din eventually had to fight the succeeding CEO and president, Bill McCune, which was very unpleasant for both Din and McCune. However, the confrontation was necessary to mitigate Din's influence. It's a sad story in the final part of it.

THACKRAY: McCune essentially was never able to get an independent, viable, research center. Is that one way of saying it?

BLOUT: That's correct. He and I tried, for example, to apply some of the techniques of Polaroid to medical analysis. We didn't do it. We developed an instrument in conjunction with another organization. It was successful, but not a big success. Bill also tried to make Polaroid mimic Kodak's attention to the quality of its products. Bill led that difficult fight. Unfortunately, he didn't succeed in doing what he thought he should do; namely, developing new photographic systems that would answer some of the objections to the present Polaroid instant photography.

Polaroid's contemporary company is a hollow shell. I am very fortunate that I was at Polaroid during its heyday. I got out early enough, without suffering some of the emotional problems that other people had in the latter days of the company.

THACKRAY: Yes. You may not have known it at the time, but you're a master of timing.

BLOUT: I didn't know it, but I was lucky. I've been lucky in lots of things in my life. I keep thinking about it now, especially in the last few months, as I grow older.

THACKRAY: Should we turn to some family topics?

BLOUT: I don't know whether it's been clear, but I married my childhood sweetheart, Joan Dreyfus. We married within a few months of my graduation from Princeton.

THACKRAY: She was a New Yorker?

BLOUT: She was a transposed New Yorker. She was born in Montgomery, Alabama, but her father was a salesman who worked out of New York, so she lived there. I met her, actually, on the street in New York. Jack Dreyfus said he would continue Joan's fairly generous allowance if we married while I was a graduate student. I was very grateful for that allowance because it helped an aspect of my life. Joan's father and I were empathetic, which resulted in my advising him on some of his financial and charitable endeavors after I left Polaroid. We had grown much closer by then.

THACKRAY: In what year did you marry?

BLOUT: We married in 1939. I was a graduate student at Columbia [University].

THACKRAY: And what did Joan do?

BLOUT: She was a student at Skidmore College, in New York.

THACKRAY: And then did she become a full-time housewife?

BLOUT: Yes. She doesn't admit it, but she did become a full-time housewife and mother. We had three wonderful children in the 1940s. All of whom were born in the Boston area; actually, at Boston Lying-In Hospital.

THACKRAY: What are your children's names?

BLOUT: My oldest boy is named James, my oldest girl is named Susan, and my youngest boy is named William.

THACKRAY: Do you recall their birthdates?

BLOUT: Certainly. Jim was born on 22 February 1943. Susan was born two years later, and William two years later.

THACKRAY: And what are they doing now?

BLOUT: My two boys are living in the Boston area, and my girl is living in the Chicago area. I wasn't home very often while my children were growing up because I was working twelve or eighteen hours a day, at both Polaroid and Harvard. I lost some of my fatherhood and adulthood because of my work, but I gained, as it's clear, other things. I guess that is life. You don't win in every way. [laughter]

THACKRAY: The 1950s, which was a very crucial decade for them, was when you were working hardest and also enjoying your greatest success.

BLOUT: That's right. And I was beginning to enter a new life. I made the decision to leave Polaroid when I was forty years of age and was financially self-sufficient. I think they suffered during that period. Around the end of that time, we had acquired property and a boat in Cuttyhunk, Massachusetts. The boat was for lobster fishing, which was very practical, and that's how I learned to be a boatman. It's interesting with the boat. My youngest son suggested we name it *Nomad*, and that was because I was frequently frustrated by family issues. So, my first boat was named *Nomad* and next boat was named *Peptide*.

THACKRAY: How did Joan respond to the success and the change in circumstance?

BLOUT: If I look at it honestly, I think she was jealous. She could never quite accept the fact that I was succeeding without her. She wanted to be recognized for her part in my life, and she never really succeeded in that.

Joan and I were divorced in 1984, and we maintain a difficult relationship. She now lives in the same apartment building that I live in. I didn't want to move from the building and neither did she; we were both stubborn about it. So she and I have separate apartments in this building.

THACKRAY: Nineteen thirty-nine through 1984 is a long time. Were you separated and then divorced?

BLOUT: We were separated in 1978. I remember it well. She helped me move out of our apartment. I rented an apartment in the building, and she helped me move. That was the beginning of the end.

THACKRAY: How long before did you know that this was coming?

BLOUT: We separated in 1978 and were divorced in 1984. It took us quite awhile.

THACKRAY: But before 1978?

BLOUT: It was clear that I was unhappy. I had a couple of other female friends during that period, and that didn't help our relationship. When Joan and I were finally divorced, I asked Gail Ferris to marry me, and started a new part of my life. Gail and I have been very different, and we've been very happy in our relationship. In fact, we felt so strongly about each other that we decided to adopt a child. We looked around the world to try and find a young girl. We couldn't find a satisfactory young girl in the United States, so we decided to look in Russia. Finally, we found and adopted a girl from Kazakhstan about ten-years ago. She's been a great pleasure in our life. Her name is Darya. We kept her Russian name. She knows she was adopted. She also knows that we searched the world to find her, and we were very happy we found her.

THACKRAY: How old was she when you adopted?

BLOUT: She was six months old. We found her in a Kazakhstan orphanage.

THACKRAY: And that was what year?

BLOUT: It was 1993.

THACKRAY: Tell me a little bit more about Gail. When were you married?

BLOUT: We were married in 1985. She was actually my assistant at Harvard, so we knew each other well. She comes from a large family, eight siblings, whereas I was an only child. So it is an interesting marriage. Gail is a very understanding, intelligent, caring person, and I consider myself extremely lucky.

THACKRAY: In retrospect, do think your divorce was inevitable?

BLOUT: I think so. In fact, I've talked about this with several people, including my oldest children. They couldn't understand why we didn't get divorced earlier.

THACKRAY: There's been a huge change in social assumptions in the background, of course.

BLOUT: Right. There have been all kinds of changes. Joan liked many of the things I was able to provide to her, and she still considers herself very friendly and loving to me.

There were other aspects of my life during this period, one of which was fishing. I became very interested in deep-sea fishing, and I had two fishing boats. In fact, I went into a few fishing tournaments to try and boat large fish; I was hoping to catch a swordfish. I had one on the line, but one of the disappointments in my life was that I never could put one in the boat by rod and reel. We wanted to do it in a sportsmanlike way, rather than to stick them with a harpoon. I never got one into the boat with a rod and reel.

THACKRAY: How did that world ever come to your attention?

BLOUT: That started out because when Joan and I lived in Cambridge, we had a neighbor named Eunice Sawyer. Eunice was about our age, and she had been born in Fairhaven [Massachusetts]. Her fantasy was to have a house on Cuttyhunk, a small that juts out into the ocean, about twelve miles from Fairhaven. And she actually did it. When World War I ended, she and her husband put together five-thousand dollars to buy the land and build this house.

THACKRAY: Was that in Maine?

BLOUT: It's off the coast of New Bedford, Massachusetts. In fact, Cuttyhunk is the last of the Elizabeth Islands; beyond Cuttyhunk is the Atlantic [Ocean].

We originally rented from Eunice, and then when she had financial difficulties, we bought the house. Then, we expanded the house, bought new land on Cuttyhunk, and established a new life on the island.

THACKRAY: How many people live on the island?

BLOUT: Twenty-five to thirty during the winter, and about two to three hundred during the summer. Actually, it has its own government. There's a town-meeting kind of a government, and Gail is now a selectman on the island. She goes to the island twice a month for the meetings. So we still have a very close relationship.

THACKRAY: There's a ferry?

BLOUT: Yes. There's a ferry from New Bedford. There are people who travel in fishing boats, and recently there's been an airplane coming from the New Bedford airport, which can land at the airport or in Cuttyhunk Harbor with the aid of pontoons. So there's transportation, but it's not easy transportation.

THACKRAY: When did you start going there?

BLOUT: In 1950, thereabouts; only in the summers.

THACKRAY: You were at Polaroid then, so you didn't have long break?

BLOUT: No. I had a week or so.

THACKRAY: When you were in your Harvard phase, did you go there for longer periods of time, or not?

BLOUT: I wanted to. In fact, when I was in my Harvard phase, I had the fantasy that we could live three months in Cambridge, live three months in Key Biscayne, Florida, where by then we had a house, live three months in France where we also have a house, and spend three months at Cuttyhunk. So there would have been four, three-month periods. This was fantasy, but it was my fantasy at the time.

THACKRAY: How old were you when you said, "This is my desire?"

BLOUT: I was just turning sixty.

THACKRAY: So did you do it for one year? Did you ever get on the program?

BLOUT: Never. When I was married to Joan, we spent about two-and-a-half months one winter at Cuttyhunk. That was pleasant in some ways and difficult in others.

THACKRAY: How old were you by then?

BLOUT: At that time I was about fifty-five.

THACKRAY: I was going to say, in one aspect, I'm listening to confessions of a workaholic.

BLOUT: That's right. I found it very hard. I didn't realize I was such a workaholic until I was older, but the fact is I'm not happy unless I work. I found reasons to work during my first marriage, and even now.

THACKRAY: Now, Elkan, given that desire, what is your typical week like? Are there days that you really take off?

BLOUT: Yes. In old age, and since Gail and I have married, we recognize that while we love Cuttyhunk as a vacation paradise, it's impractical to have an island be the aim of your vacation, so we looked for property much closer to Cambridge, which we could use as a vacation home. Fifteen years ago, we found some property in a town called Marion, Massachusetts, and we were wealthy enough that we could afford to build a house. We now use that house, the Marion house, for weekend vacations. Generally, we spend five days a week in Cambridge and two days a week in Marion.

THACKRAY: And that's the normal?

BLOUT: That's a normal pattern. In the last two years, as I've grown older, we've not only had that pattern, but we've stayed at Cuttyhunk between six to ten weeks a year.

THACKRAY: Discuss you work at the Food and Drug Administration [FDA].

BLOUT: As I've said, many of the good things in my life have happened by chance. One of those things was the start of my association with the FDA. I have spent about eight years working for the FDA. A colleague of mine at Harvard, Paul Russell, was friendly with the new commissioner of the Food and Drug Administration, David [A.] Kessler; a previous student at Harvard Medical School. The commissioner asked Paul to join the Food and Drug Administration as his scientific person. At that time, Paul was a surgeon at Massachusetts General Hospital, and didn't want to move, so he suggested me

for the job. I went to Washington, met David Kessler, and we hit it off. I became his senior advisor for science.

I was with the Food and Drug Administration for the duration of Kessler's term as commissioner. It was an interesting eight years. David wanted me to be full-time in Washington, but I told him I thought I could do the job without being full-time. I didn't want to work there full-time either, so he agreed. Regardless, I used to spend up to five days a week traveling from Cambridge to Washington for that FDA job.

You could ask: what did you do at the FDA? I didn't approve medicines or approve medical products. Instead, I worked with the FDA's senior scientists to develop the content of their positions, and make them more useful. In addition, I set up the senior science council and the younger science council, which lasted throughout and beyond my tenure.

THACKRAY: Those were all people at the FDA?

BLOUT: At the FDA, right. I worked with them. I never actually rented an apartment in Washington, either. Instead, I just asked the Watergate [Hotel] if they would reserve a room for me when I visited. They agreed, so I spent that period at the Watergate Hotel.

THACKRAY: What was the purpose of those science councils?

BLOUT: Their purpose was to convince scientists to collaborate with each other, and they were quite successful. I still have some of the plaques on the walls of my study that show the signatures of some of my associates. It was quite a rewarding time for me because, although I had been in Washington as the treasurer of the National Academy of Sciences, I had never worked for the government and I was working for the government when I was with the FDA. So, I was aware of the positives and negatives of working for the government.

THACKRAY: What are some of the positives?

BLOUT: I got interact with people at the crux of their activities, and I was in a very important position. After all, the Food and Drug Administration approves about 30 percent of everything this country produces. So it was a very challenging period. David Kessler and I really enjoyed each other. In fact, he knows it was I who recommended him for the dean at Yale Medical School.

THACKRAY: What were some of the negatives of that government position?

BLOUT: We never had the money to attract the top scientists in their fields. We did have a few good people, but not the very top people. As a result, the Food and Drug Administration was more a licensing organization than a creative organization. I tried to make it more creative, but I was not successful.

THACKRAY: If we come back to family, you've mentioned the deep-sea fishing, the boating. So you must've had some vacation time?

BLOUT: Yes. I did have days which I could take off. In the early days, I learned to fish with my children, and in later days, I learned to boat. In fact, Bob Woodward used to enjoy an occasional day or two on the boat. In fact, during his marriage, he and I both ran one of the *Peptide's* from Cuttyhunk to Bridgehampton where he docked it. He was challenged by trying to run a boat, as I was, so that was one of the things that made us close.

THACKRAY: How many people did it take to run the boat?

BLOUT: Two could do it, but really three should have been there. It was about a thirty-eight-foot boat, so we had to have more than one.

THACKRAY: So who would you most often boat with?

BLOUT: I most often boated with my brother-in-law. I haven't mentioned him. I mentioned one of them, Joan's brother Jack Dreyfus, but my other brother-in-law was Joan's sister's husband, Dick [Richard] Reiss. He was a classmate and roommate of mine at Princeton. He and I were very close and friendly, and we spent a lot of time together. In fact, we still see each other now.

THACKRAY: What are some of your other hobbies? You all ready mentioned gardening.

BLOUT: Yes. I guess since I am a born and bred New Yorker. For recreation, I am attracted to the land. Part of it was living at Cuttyhunk, part of it was living in France, and part of it was our condominium at Key Biscayne. I've always liked gardening, and I love growing things. I built a greenhouse while Joan and I were married and living in

Belmont, Massachusetts. It allowed me to relax. Then, when Joan and I moved from Belmont to 1010 Memorial Drive, I built a greenhouse in our apartment

THACKRAY: When was that move? Was that after your children had grown?

BLOUT: Yes. It was at the instigation of Bob Woodward. He was living here as a renter, and he knew the building was being turned from a rental property into a condominium-cooperative property. Therefore, he convinced me to buy a couple of apartments at 1010, in early 1970s. Joan and I intended to live here at 1010. Then, we modified the apartments, installing an internal greenhouse for me, and a special tub and bathroom for Joan. So we used our money during that period, trying to be happy, but we never succeeded.

THACKRAY: Do you still have a garden at your country home?

BLOUT: I still have a greenhouse in my country home, and in fact now, I've started to grow orchids in my greenhouse at Marion; I've become fascinated by them. I continue to grow them here at 1010 and at Marion. Growing plants is one of the ways I relax. It wasn't all work, though it was a lot of work. I also had a room to build a greenhouse, to buy orchids, and to endow other things which I will tell you about in my life.

As I look back on it, I consider myself to be, in many ways, very fortunate. I haven't lived a perfect life, but I lived an interesting and challenging one.

THACKRAY: Did you ever visit the opera, the ballet, the orchestra, or go to parties?

BLOUT: I didn't want to do that sort of thing during my marriage. I was working very hard, originally at Polaroid, then at Children's Hospital [Boston], and then at Harvard. I didn't have much time to do anything but work. I guess if I wanted to, I could, but I didn't and I don't now. I suppose I enjoy my life through my work; it has been a challenge. I've had numerous different aspects of my life, starting with Polaroid, all the way to my work with the Food and Drug Administration. I've had lots of different challenges, and met lots of interesting people. Some of them I've mentioned, but I've yet to mention the many interesting female companions I've had during my life.

At any rate, I've always wanted to return to society all that I've gained from my hard work.

THACKRAY: Will you talk about that?

BLOUT: Yes. I feel I've made enough money to do most of the things I've wanted to do. I've even made enough to be divorced and still be financially capable, which is very difficult. We've all read in the paper about public divorces, such as Jack Welch's troubles as the former president of General Electric [Company], so we all can imagine the difficulty of divorce. However, my goal in the last 20 to 25 years of my life has not been to make more money, but to give some of that money to society. Currently, I've been spending much of my time working with groups that want to do things for society rather than develop things commercially.

THACKRAY: Describe some of the ways you've contributed to society.

BLOUT: One of the ways I have given back is by being an affiliate of the IOCD. I've been vice president and treasurer of that organization for over 20 years, and I spent a lot of time trying to figure out how we, as part of a successful society in the United States, can help the developing world grow and improve. We've worked hard, and though we haven't been uniformly successful, we are successful occasionally.

It reminds me of our former president, Jimmy [James E.] Carter, who spends a lot of his time trying to give to society. I've been fortunate in that during my life I have always been affiliated with interesting, highly-intelligent individuals. That has been a wonderful part of my life, that I've had the pleasure of knowing, intimately, people like Bob Woodward, Linus [C.] Pauling, Jean-Marie Lehn, and others; as well as those who are more devoted to industrial life, such as Din Land and Jack Dreyfus.

I give back in various ways by working for organizations, but also by trying to create new organizations. I used some of the money I have to develop a small family foundation, which has given away grants to certain projects I'm interested in. We're in the process of converting the family foundation into a larger entity, which the National Academy of Sciences will assume. It will benefit the National Academy, and be integrated into their programs.

THACKRAY: What will the nature of that entity be?

BLOUT: As I've grown older, it became clear that young children need more exposure to cultural and scientific activities that they usually don't encounter. Therefore, our foundation will be converted in to an endowment at the National Academy to educate younger people about the significance of science in society. More specifically, we hope to produce five-minute television segments that will interest today's youth in the future of science in society. So that's my latest project. It's not complete yet, but we're in the

midst of negotiations to terminate our foundation and to give it to the National Academy of Sciences.

In addition to those activities, I maintain my interest in making new products. I've been affiliated with Enanta, which is trying to make new products. I'm also associated with a small, non-profit organization that's trying to produce a satisfactory AIDS vaccine. Hence, I keep myself busy not only thinking about research, but actually doing some of it.

I really feel I'm fortunate in some things, and there are other things that I'm still working on, like having a satisfactory relationship with my oldest three children. I don't feel we have yet reached a satisfactory relationship.

[END OF TAPE, SIDE 1]

BLOUT: In conclusion, one of the awards I've received, which means a lot to me, was from the Phillips Exeter Academy. In 1998, they gave me the John Phillips Award, with a citation that reads, "An Exonian whose life and contributions to the welfare of community, country, and humanity, exemplify in high degree the nobility of character and usefulness to humanity that John Phillips sought to promote in establishing the Academy." This was a very satisfying part of my recent life, and that's what I'm continuing to try to do.

THACKRAY: It's a wonderful citation and true of your life so far. Thank you very much for your time.

BLOUT: Thank you.

[END OF TAPE, SIDE 2]

[END OF INTERVIEW]

NOTES

1. W. D. Paist, E. R. Blout, F. C. Uhle, and R. C. Elderfield, "Studies on Lactones Related to the Cardiac Aglycones. III. The Properties of β-Substituted $\Delta^{\alpha,\beta}$-Butenolides and a Suggested Revision of the Structure of the Side Chain of the Digitalis Strophanthus Aglycones," *Journal of Organic Chemistry*, 6 (1941): 273-289.

2. See note 1 above; E. R. Blout and R. C. Elderfield, "Synthesis of β-Substituted $\Delta^{\alpha,\beta}$-Butenolides from Methyl Ketones," *Journal of Organic Chemistry*, 8 (1943): 29-36; E. R. Blout, J. Fried, and R. C. Elderfield, "The Condensation of Ethyl Oxalate with Ethyl γ-Cyclohexylcrotonate and a Method for Predicting the Products from Such Condensations," *Journal of Organic Chemistry*, 8 (1943): 37-42.

3. R. B. Woodward and E. R. Blout, "The Condensation of Acyloins with Ethyl Acetate," *Journal of the American Chemical Society*, 65 (1943): 562-565.

4. For a complete list of Elkan Blout's publications, see Chemical Heritage Foundation Oral History Research File #0095.

5. E. H. Land, E. R. Blout, D. S. Grey, M. S. Flower, H. Husek, R. C. Jones, C. H. Matz, and D. P. Merrill, "A Color Translating Ultraviolet Microscope," *Science*, 109 (1949): 371-374.

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