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Davis, Lewis Winfield oral history interview

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Interview with Lewis Winfield Davis by Stuart O'Brien and Rob Chavira

Summary Sheet and Transcript

Interviewee
Davis, Lewis Winfield

Interviewer
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Chavira, Rob

Date
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Place
Auburn, Maine

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Biographical Note

Lewis Winfield Davis was born February 7, 1914 in Auburn, Maine to Wilbur and Gertrude Davis. His father worked for a bank and his mother was a housewife. A science scholar, Lewis graduated from Bates College in 1936 with a B.S. in Chemistry and Physics and later went to MIT and Northeastern University. He worked as a researcher for most of his life for General Electric and then Metal Hydrides. He became president of Metal Hydrides, Inc. in 1970 after many years as a chemist and manager. While there, Lewis worked on Uranium with Einstein to help produce the world's first atomic bomb and the development of nuclear technology. He was on the executive board of Trustees at Bates College for ten years.

Scope and Content Note

Interview covers such topics as: Auburn, Maine; Davis's Republican family background; the Depression; his Bates College years; Ed Muskie's personality; his career in chemistry research; the Recession period; the Manhattan Project; the evolution of Uranium and its supply during WWII; the development of nuclear technology and the atomic bomb; his business dealings with Muskie; Bates College professors in the 1930s; and Muskie's characteristics.

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Transcript

TOB: Want to start by telling us your full name and spelling it?

Lewis Davis: Yes, Lewis Winfield Davis, L-E-W-I-S, Winfield, W-I-N-F-I-E-L-D, Davis, D-A-V-I-S.

TOB: Where and when were you born?

LD: Here in Auburn, February 7, 1914.

TOB: What were your parents' names and occupations?

LD: The parents were Gertrude Davis and my father was Wilbur Davis. They had lived here in Auburn for many years. And he was with one of the banks, and she was a housewife.

RC: Did you grow up here in Auburn?

LD: Yes, and always said that I'd never come back.

RC: From your very inception until now you've lived here?

LD: No, no, until college days probably.

TOB: What were their political affiliations?

LD: Republican, yes, conservative, very. And not particularly political in the sense of being active in that they had strong feelings about who was in various positions in their party affiliations, but never participated in the campaigns.

TOB: Did they, what was the community atmosphere growing up in Auburn at that time?

RC: Was it predominantly conservative, would you say?

LD: I would say so, yes. I think perhaps until after I'd finished college and maybe come back awhile, it never occurred to me that it had a complexion. I was oblivious to community philosophy and psychology and I suppose I had other things on my mind. But it was, it was quite divided in the sense that there were French people, French speaking, evident everywhere and then the more traditional Native American. So it was a two-society environment, and I think I was aware of that. It never caused any problems for anyone. It was just a fact of life.

RC: It's very interesting, of everyone we've spoken to, everyone has mentioned the ethnic diversity of the Lewiston-Auburn area. But that's the first time I've heard Native American folks mentioned at all.

TOB: Now, when you say "Native Americans", do you mean as opposed to French Canadians? You don't mean Indians?

LD: No, I don't have a better word to describe it. But no, not Indian but the traditional white New Englanders.

RC: What was it like religiously? Was there a lot of dissent there, too, a lot of diversity?

LD: I wouldn't have been aware of it, I don't know.

TOB: What high school did you attend?

LD: Edward Little, Edward Little, yes.

TOB: Were you involved in extracurricular activities while you were there?

LD: Very little.

TOB: Very little.

LD: Very little.

RC: Were you a good student?

LD: Pardon?

RC: Were you a good student?

LD: We have one or two teachers here that were my teachers at Edward Little, and I guess you'd have to ask them. They haven't said anything bad about me yet.

TOB: What are their names?

LD: Mrs. Florence [Pennell] Gremley and I can't think of the other one, but she's quite ill and probably couldn't be interviewed.

TOB: What were your aspirations in high school? What did you want to be?

LD: I don't think that I really had any, until maybe the senior year in high school. The objective was to obtain as good an education as possible with the economics of the times. And there was little thought as to what profession one would go into or where that would be, though if it passed through your mind you would assume that you would graduate from at least high school and if possible college and work in the area. And you probably would have to take any kind of a job that you could find, because that was the beginning and early days of the Depression. There wasn't much choice. In the last year of high school, two of the teachers interested me in scientific events and teaching, and I think I probably began to form my leaning in that direction my senior year of high school. But it didn't really mature until probably the second year of Bates.

RC: You were saying that during high school was the beginning of the onset of the Depression. Tell me a little bit about how that affected you and how that affected everything around you growing up.

LD: Well, it's pretty hard to say, because you try to work those things out of your memory. My father lost his job, as did many men, and did itinerant work of various semi-professional kinds that he could pick up. Today you'd probably call it consulting. And we survived. My mother went to work on a part time basis and the two of them kept the family together. The same thing was occurring in most of our friends' lives, too; they were disrupted by one thing or another. And you struggled to do anything that you could to keep expenses down and find some sources of income, which in today's monetary terms was pretty small. I worked doing minor repair work, houses in the neighborhood for people who needed help but couldn't afford the professional contractors for painting and minor repairs. And I mowed lawns and shoveled snow in the winter and things of that sort. Finally in the last year of high school I was asked to do some what I called chauffeuring for two people. One was the county attorney and his family, and the other one was a widow lady that needed somebody to drive her car almost every day for recreation and for shopping trips to Portland and so on. And she would have me maintain the automobile with the help of local garages for that kind of work as necessary, and plan the trips

that she'd like to take for maybe two hours out of town and two hours back, four to five-hour day. If it didn't include shopping, she just liked to go to Brunswick, Bath or Augusta; do some sight-seeing. So that essentially paid for college education, which wasn't then what it is today.

TOB: How many brothers and sisters did you have?

LD: None.

RC: None, you're an only child.

LD: I'm the only child. And I've shown the pain and marks of it. I'm sure. It would have been better if I did have other siblings.

TOB: What colleges did you look at?

LD: Really, Bates College was the only one where I took serious study programs and received a degree. But after I went to work out of state, I took courses at MIT and I think, as I remember, at Northeastern occasionally, --extension courses, night school, weekends.

RC: Now were you expected to go on to college after high school?

LD: Oh, yes, indeed I was.

RC: It was absolutely . . .

LD: Oh, it would have been heresy if I hadn't.

RC: Do you think that has to do with trends of the time or your particular family?

LD: It was I think due to two reasons; one that was never discussed was the fact that neither my mother or father went to a formal college. I think my father graduated from business school in Lewiston which probably was a two-year effort, and my mother didn't go to college at all. But it was beginning to be desirable if you wanted a good professional life, particularly outside of Maine, to have a college education. And the other influence, probably very strong, was that my father's sister graduated from Bates and married a Bates man. And they would come back for reunions almost every year, and when I was old enough they'd take me over. So that began to infect me, and I say infect as well as affect, and it also conditioned my family to recognize what college had done for them. I think they graduated in 1912.

TOB: Tell us what Bates was like during the Depression.

LD: I don't know that I can tell you more. Any question that would help an answer?

RC: I certainly know that by today's standards, Bates is considered, although its endowment isn't as big as other schools, in general it's considered a pretty affluent school with affluent

students going there in a town that's less than affluent. Was it the same sort of situation during the Depression?

LD: Yes, yes, and probably relatively the same relationship money-wise. The, it seems to me that one year my tuition was about a hundred and fifty dollars a semester. And almost, for the three years, I and my friends had to borrow some money to get through, and borrow outside the family resources. And there were places you could do it through the help of college officials and through the local banks and what not, in spite of the Depression. And most of us would call on relatives and local sources for supplemental help for hundred dollar bills. It was nothing to borrow seventy-five dollars to pay for part of a semester's education. And then you'd work for a while and pay it off. Next year you'd borrow it again.

TOB: Did you live at home when you went to school?

LD: Yes, I did.

TOB: What was the relationship like between the people who lived at home, the local residents, and the people who stayed in the dorms?

LD: There was no rivalry or distinction either way by those few that did live at home and those who lived in the dorm. My feeling today is that it compromised our education a great deal because I think having lived in the dorm teaches you a great many things about people and about how to study, how to have recreation. You miss a lot of things. But life was pretty serious for anyone in school. And when they could they had part-time jobs, like janitorial service with people in the neighborhood of the college. So students were pretty well occupied in their free time with striving to get some spending money.

RC: I tell you, for, I think college in general is the time when you go away, oftentimes, and you kind of get shocked. You're thrown into a context where you have to deal with all different kinds of people and so forth. Did that not happen to you because you were from Auburn?

LD: That's correct; it didn't. And I didn't feel that it was anything vital that was missing. It was a fact of life, and probably I didn't really want to live at the school. I wasn't particularly aggressive in forming relationships with people. I had to study a good deal to get by, so the non-academic atmosphere that Bates could have offered I didn't miss. But I think, nevertheless, it did shape my career and personality probably up even into retirement. I think you're better off to go away from home and go to the college of your choice, learn to live with people, learn what makes them motivated and maybe change your own objectives depending on what you see others doing.

TOB: That's a good point, certainly a good point. Did you do any extracurricular activities at college?

LD: No, none.

RC: You mentioned that you had an inclination, even as far back as high school to some degree, towards science. Did that just, did college just exacerbate that and you became much more involved in scientific studies?

LD: Yes, and that was because with the low degree of interest that I came to Bates, I tended to think more strongly about that than literature or some of the art courses, and became involved with other students who were scientifically bent and just developed a friendship and relationship that enhanced that degree of interest. So I went on with it. And maybe today it does the same thing, but with the science courses you get involved a lot more in laboratory work that requires time beyond the classroom work and library and studying. So you are thrown into groups of other people, you're thrown into a time span of maybe an hour or more doing experimental work or researching at the library. And sometimes that can be a participating endeavor with other people.

RC: So you still did have a peer group and develop a social group that you hung out with?

LD: Oh, yes. There was a strong group in the last, say, three years at Bates amongst the scientific people, whether they were majoring in one science or the other.

TOB: Now, what was your major course of study?

LD: Chemistry.

TOB: What teachers were most influential, I mean while you were at Bates?

LD: Well, naturally the science teachers were more effective on some of us, and particularly me. Dr. Lawrance, Dr. Stewart who was there only a short period of time, and Dr. Thomas who passed away a few years ago. Karl Woodcock in physics. Who was the head of the biology department in those days? But he had, if I think of his name I'll bring it out, but he was very, he made a great impression on me. Because biology was a subject that probably I avoided because I wasn't interested in the handling of animals, and later being a doctor with people operation and what not. But he opened up a whole new area of technical thinking for a few of us that had specialized in chemistry and physics. And we enjoyed that a great deal, even though we didn't want it as a career.

RC: So you also had substantial course work in physics as well, that was also of interest to you?

LD: Yes. And I say again, we, the group there at that particular time majoring in chemistry, were fascinating by the evolving work in physics and took as much of that as we could.

RC: Do you remember any of the names of the people who swung in that circle with you?

LD: Students? Bernard Hutchins, Fred Smith, Samuel Kingston, oh dear I had . . . Dumais, I forget his first name, and I think he became a doctor in Lewiston.

TOB: Where did you have most of your classes?

LD: That's a hard one to answer because even then we moved around a good deal. Probably Hathorn Hall, but for science it would be Carnegie and Hedge Laboratory.

TOB: Hedge Laboratory.

LD: That is now . . .

TOB: A dorm.

LD: Yes.

TOB: When you say Carnegie, you mean Dana?

LD: Yes.

TOB: Dana chemistry was probably the other science . . ..

LD: Right. See, that's on one side of the library. Hedge lab was on the other. Yes.

RC: What did you want to be at that point, after you started?

LD: A chemist.

RC: It didn't matter in what field necessarily, you just?

LD: No, and I don't think that even when I graduated I was aware of the wide fields of any science that you could get into, neither the determination of narrowing down interests and becoming specialized. That never occurred to any of us. And there again I don't know where we missed the counseling that would have helped, but somewhere I'm sure our careers were compromised by not seeing the views that were open to us. Even though the Depression was still ending, there were choices that you could make, even though they might be negative choices that had a big influence on the future. And we were poorly adjusted to make those choices.

TOB: Were students really interested in world affairs and national politics during that time?

LD: No, none of us had much interest in . . .

TOB: So, Bates was kind of an insulated bubble.

LD: Yes. I think there were a few that were well aware of life outside the bubble. And one of them would have been Ed Muskie, Larry Butler in his class, a few. I can understand why Muskie would have had that kind of diversified view. Some of the others, I don't know where they acquired it.

TOB: It's Saturday night during the school year. What would you do on a normal Saturday night?

LD: Go to the movies probably. And you might go to a dance. Chase Hall had dances. Most of the science majors took pride in avoiding social activities. Do they today?

TOB: I feel as though it's similar today. Did everyone, on a normal day would people be dressed up in shirt, would you wear a shirt and tie to class?

LD: Yes.

TOB: You would?

LD: Yes.

RC: Now, was that just custom or was that a rule?

LD: No, I'm sure it was not a rule. It was just, that's the way it was done. And it was for quite a long time after I graduated, too, as I went back. And of course you started the day out with going to chapel, that was mandatory.

TOB: When did you first meet Ed Muskie?

LD: Oh, probably in the, maybe in the first freshman year but more likely in the sophomore or junior year. He would have a widely different activity schedule than me. One, that I commuted made a big difference. So I never saw any of these students, friends, in the social environment after hours, an informal arrangement. And it probably took quite awhile to get acquainted with him.

TOB: What was your impression of him as a person?

LD: I was very impressed with his maturity. And I've thought a lot about that. But even in college he had a stability, a calmness and deepness of thought that was different than most of us. Where he acquired it, I don't know. I ought to think more about it I suppose because in my later years I had the rare privilege of knowing some people who had been extremely successful. And every one of them had a different personality and a different character than what I'd call the average individual. They were very acute at defining a problem, devising solutions for it, and selecting a solution, had a great deal of calmness to their reasoning process, and an ability to explain it very simply and quickly. And no matter what profession they rose in, that seemed to be an attribute. Well, Muskie exhibited that in his college days but I don't think any of us put a tag on it. It was his personality.

RC: You mention that he and Larry Butler and a very select few others were some of the few that really had a grasp on some of the larger issues going on in the country and internationally. And you said Muskie you could understand, however the others you don't really know. What is

it about Muskie that you think produced that, about his background, or you mentioned something of that sort?

LD: I don't, I can't answer that.

TOB: How did you get to school in the morning?

LD: If I had the car fare I'd take the streetcar; if I didn't have the five or ten cents streetcar fare, I walked. And sometimes I walked just because I got out early and had time and wanted to.

TOB: How long a walk was it?

LD: About three miles. Did I hear you say "not bad"?

TOB: Yeah.

LD: I'd hate to do it today.

RC: In this weather, nonetheless.

LD: Yes. As a matter of interest, I lived quite close to where we are here at Schooner.

TOB: Oh, you did?

LD: Yeah, about half a mile from here, down toward town.

TOB: Towards the river.

LD: Toward and away. It was back of the motel that's down the street. If the River Road, where it intersects Center Street, went right straight across through that little shopping center, you'd come out in my front yard. Where that shopping center is down there used to be a baseball field, and then they scooped it out.

TOB: What kind of social interaction did you have with Ed Muskie? What kind of academic or, interaction? How did you know him?

LD: Only as a classmate during college, and I'd naturally see him and like to talk to him at reunions. He was very loyal to those. And then maybe I got to know him better after we were trustees together, because I would see him each time there was a trustee meeting. And once in awhile we'd work on committees together.

RC: Now at Bates, was he a very visible individual? Did he stand out of a crowd or was he shy, shied away from . . . ?

LD: I really can't answer that. Some of his closer friends, Damon Stetson had, you know him? He lives in Portland; he knew him intimately and he was an editor for the *New York Times* for a

number of years. So he had international skills at dealing with people that most of us never had. And Larry Butler I think roomed with him quite a lot. They'd be able to answer questions like that.

RC: Well, I didn't mean necessarily from experience knowing him. I meant just as an outsider knowing who he was, what was your, what do you think the perception of Muskie was as opposed to . . . ?

LD: Of responsibility and integrity and anything that goes with maintaining a degree of civilization.

TOB: He was a high-profile student. He was always in the newspaper and one of the leaders of the class, is that right?

LD: Yes.

TOB: So you, most people would have known him just because he was head of this or, being written about in the paper . . .

LD: Yes, and we respected his ability to find the time to do these things and we respected his representation of the rest of us that didn't want to do it. Oh yes.

TOB: What was your interaction with him like, later, at reunions? Was he approachable?

LD: He was very approachable, very. I don't know how he would be to a total stranger. He might shy off being his usual outgoing self if a total stranger came up to him. But whenever I've met him in Washington or occasionally our paths in travel would pass, very easy to talk to. Anxious to spend time speaking with people. "How are you? What are you doing now?" And then you'd ask him what he's doing and he'd fill you in. Very social.

TOB: You said your paths would cross in Washington. Why? Why Washington?

LD: Well, that was where, that's where he was most of the time that he had time to see people for appointments and interviews. And in the professional period of the time I was in Washington almost every week and called on him several times for help in unraveling the paths of quandary and obtaining introductions to people, opening doors.

TOB: What was your position that you were doing this? What was your employment?

LD: It was with a company called Metal Hydrides, Inc. And I went to work for them fairly early in my career, and after a number of years became president of the company.

RC: When you started out, there wasn't very many people in it were there?

LD: In this area of science or in the company?

RC: In the company.

LD: There was zero. It didn't exist.

RC: Did you find the company, so to speak?

LD: No, I wish I could say yes. My first job was a grave disappointment and I went down to Louisville, Kentucky with a divisional of Corning Glass Works. And I didn't like either the type of work that they put me on, or life in Louisville, Kentucky. So when I got an offer of a job in the science department at the General Electric Company, I came up and went with them.

TOB: What year was this?

LD: Nineteen thirty-seven, a year after college. I stayed in the deep south about six months and that's all I wanted of it. And . . .

RC: So it wasn't the job as much as the south?

LD: The job was a miserable one, too. It was strictly low-grade analytical chemistry; offered no challenge, no sign of advancement, and a miserable conditions in the laboratory. But in addition to that I didn't like Kentucky. If it had been winter I might have, but I went down late summer and stayed until October and that was like Texas is this year, currently.

TOB: Now when you joined General Electric, Hitler was starting to roll across Europe. Were they upping their production in anticipation of producing . . . ?

LD: No.

TOB: It was still too early for that?

LD: Well, other plants might have been. I went to the one in Lynn, which is called the River Works, and they suffered severely during the Depression and employment there was at a very low ebb. But things were beginning to come back in the middle, late thirties, and they were reopening their control laboratory in Lynn that monitored the processes that were going on throughout the factory by physical and chemical analytical procedures. And I was the second one hired in the rebuilding of that layout. I had nothing special to offer them and I have never understood why they hired me. Surely in those days they could have hired anybody they wanted with great experience, but nevertheless they got me. And I worked there while they were building the lab up on various projects, and then the recession of 1938 and nine occurred and they began to have some layoffs. They put me and others in the lab on a short week, I think dropped one day a week, something like that.

And I was bored, began to help another person in the laboratory who was doing his thesis work at MIT for a Ph.D. degree, and just simply did chemical work on a bench for him because of lack of time that he had. He was working part time at GE, too, and getting his doctorate. So after things began to clear up, he received his degree, he asked me to go to work on a full-time basis

with him. I liked what he was doing so I did. And finally he obtained funding from a Canadian mining company for the patents that he had received. And we stayed within the General Electric Company about five years using rental space and supported by the Canadian company. And I liked that better than the routine work that GE could have offered.

TOB: What did Metal Hydrides do?

LD: The Canadian company was mainly in gold, silver and nickel ores mined in Canada, but they also had at the head of the company a geological genius that knew of deposits of semi rare metals that are no longer rare today, but one example would be titanium. It's a metal that looks a lot like stainless steel and used for structural purposes. And they wanted to find a use for these strange ores and the process that had been developed in the Ph.D. work at MIT was such a means of converting native ores of Canada to high purity metals. We did that on an experimental basis for a few years until markets could be developed for the metals themselves. So what we did was simply refine ores to high purity metals that were rather unusual. In other words, at the time they had no commercial application but we found uses and began to go from there.

TOB: What year was this?

LD: Let's say 1940, '41.

RC: Forty-one. Now, when did uranium become . . . ?

LD: Well, the Canadian geologist had some deposits of uranium in Canada, and he wondered what they could be used for. We finally, through literature research, got a clue that they could be used for hardening steel. And to make a long story short, in WWI Germany had made steel that was unusually resistant mostly to explosives, but very strong steel, out of steel ores that had uranium as a contaminant. At the time they didn't know it was there because nobody had discovered it, and they never did realize what it was doing to improve the quality of steel. So when this became evident it was the intention of the Canadian and our people to see if we could make uranium itself and then add it in known quantities to other combinations and assess its properties. This work became known to the military people, and particularly Watertown Arsenal in Massachusetts. And they gave us a contract to study the effect of uranium on steel. But first we had to make the uranium and we did. At that time the only company in the world that could do it, though this didn't last long obviously. And we continued developmental work for the Army through Watertown and that broadened out to facilities in Washington that were interested in the technology being more widely used.

TOB: Now, did you know about the dangers of uranium at that time?

LD: No. Well, yes we did. You mean as it might relate to radium?

TOB: Radiation?

LD: Yes, but little else. We knew that it was radioactive and a lot was known about radium at the time, so it was treated as a hazardous material.

TOB: Oh, it was? You wore protection, the whole nine yards?

LD: Yes, but very elementary.

TOB: Was it sufficient do you think to protect you from . . . ?

LD: No.

TOB: No.

LD: No, I'm probably radioactive today. So watch out.

TOB: I doubt it, but . . .

RC: In what years were you working on this? Between '41 and '45?

LD: Well, probably way up to late '40s, maybe up to 1950.

RC: Were you living in Maine?

LD: No, no, this was all in Massachusetts.

TOB: So, through this you became involved with the Manhattan Project?

LD: Yes.

TOB: Did you go out to New Mexico?

LD: No, never did.

TOB: No, never did.

LD: No. We knew it was there but we didn't know what they were doing. We did have a relationship to work they were doing in Chicago and at Oak Ridge, Tennessee. The, at the time that the American government wanted to work in this particular area, there were no facilities for doing so. There was nobody that had any equipment or knowledge or ability to work with uranium, let's say. And since we'd been doing it for the military ordinance department, we were known as people where it could be acquired. So when the atomic bomb concept was developed by Szilard[1] and Einstein, we were invited to supply uranium to the Bureau of Standards, as I remember it. And Leo Szilard, did you ever hear of him?

TOB: Yes.

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1 Leo Szilard, February 11, 1898-- May 30, 1964; invented the Neutronic Reactor; an important participant in the Manhattan Project. For more information, see: http://www.invent.org/book/ .

LD: . . . . was a Hungarian national and he was very much afraid that work was going on in Germany, as it was, and that we would be left behind. So he had a friendship with Einstein and the two of them wrote a letter to President Roosevelt urging that work be done on the atomic bomb. And finally Roosevelt appropriated seven thousand dollars to start it. And he gave the company I was working for the seven thousand dollars. And we never had a relationship with Einstein. We did work with Szilard very closely and we never met President Roosevelt, and I don't think he ever heard of me. But nevertheless we acquired this seven thousand dollars . . .

TOB: So you met Szilard?

LD: Pardon?

TOB: Did you meet him?

LD: No, no.

TOB: Just through correspondence.

LD: He was a graduate of the Canadian geologist at Harvard, they were college classmates. And when he needed uranium, I assumed from evidence of the day that he called his friend, Thayer Lindsay, and wanted to know where he could get some. And Lindsay said, "Well, I've got some in my back yard." So we got the contract for it. It was much more complicated than that. That's where we got the first contract. And then we kept on with it for quite a few years.

TOB: Now, were you just sort of basically a supplier or did you have any more involvement with the project than that?

End of Side One
Side Two

LD: A lot of things that we've been talking about should have been put into writing and reports and put together, but it never has been. The essential story has been published many, many times. The Smythe report and all the other things, but the involvement of some of the pioneers has never been written.

TOB: Who do you mean, some of the pioneers?

LD: Well, the man that I worked for, Dr. Alexander.

TOB: He was the man from MIT? Who you worked with at GE?

LD: Yes. Right. We both were working for GE but in off-time he went to Tech. And Thayer Lindsay, who was the American but head of the Canadian Mining Company, had been written up slightly. But he's a man that very few people knew and he was very retiring. I've never seen much of a biography about him. I didn't know him well enough to write one, but somewhere

there must be somebody that did. Though, I knew him well; he spent every summer in Beverly, where I was.

TOB: He summered in Beverly, Massachusetts?

LD: Yes.

TOB: Is that because the company was there?

LD: Metal Hydrides was in Beverly, Massachusetts.

TOB: Is it still there?

LD: No, it has disappeared, which hurts me somewhat. After I retired, good Lord, I've forgotten when it was . . .

TOB: In 1979, you mean?

LD: Probably, probably, around that time anyway. The company was a year or two later purchased by [Morton-] Thiokol Chemical Company and they abandoned the place in Beverly. And it's now just a vacant lot, or many lots. And some of the product that we made which were hydrides, but of use to the pharmaceutical and paper industry, are made out in the western part of the country.

TOB: Getting back, just for a couple of final questions about your involvement in WWII. Your company supplied uranium to the United States government for the development of the atomic bomb, and that was pretty much your involvement?

LD: Yes.

TOB: So**,** you worked out of Beverly, would receive letters from various government agencies concerning, and all this was definitely completely top secret so you couldn't talk to anyone about it, could you?

LD: No, we couldn't. And usually if we traveled, and particularly in certain directions like Washington, we were supposed to use assumed names and not recognize people that might be going to the same conference in public, because then spies, who I doubt were watching us, could put together mysterious connections.

TOB: What kind of conferences are you talking about?

LD: Progress conferences, technical conferences, contract negotiations. I was in Washington or Chicago almost every week on these projects. You have a question about how come Chicago?

TOB: Yes.

LD: Well, pioneers from Europe who escaped early in the war were offered employment contracts with the government on early work on the atom relationship. And the big name was Fermi[2] and he was established in Chicago where they built the first self-sustaining atomic pile. And we furnished almost all the uranium for that and that took us out to Chicago to coordinate and to meet with these scientists there.

TOB: How would you ship uranium back then?

LD: Well, early in the days I hand delivered it by automobile.

TOB: In a box?

LD: Yes, yeah, it was always in tin cans and wooden boxes. But early on it was shipped as powder and once in awhile the powder would catch fire and burn. So that was rather dangerous and it was very difficult to ship. Later on I accidentally discovered that very high-purity powder could be melted easily in readily available equipment. And I worked between Beverly and MIT for quite a while in determining the feasibility of consolidating powder, uranium powder, into what are called cindered blocks, which is just pressed and heat treated, and later powder that's melted, which is the ideal way.

TOB: Much more stable?

LD: Yes. And everything that we shipped to Chicago was in the form of cindered or melted ingots, and that could go any secure way like insured railway express. Later on they always went under military guard, but not in the early days. And prior to Chicago, when I hand delivered it, it went down to Columbia University in New York.

TOB: Did you ever meet Albert Einstein?

LD: Yes, very, at very great distance. I never came up to him and shook hands, no.

TOB: At one of those conferences?

LD: Yes, yeah. And he wouldn't know me from Adam.

RC: Was he speaking, is that what it was?

LD: Pardon?

RC: Was he delivering a speech, is that what . . . ?

LD: No, just sitting in on a meeting. As I recall, he never said a word.

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[2] Enrico Fermi, September 29, 1901- November 28, 1954. While studying the creation of artificially radioactive isotopes in the 1930's, Fermi became the first physicist to split the atom. He was awarded the Nobel Peace Prize for Physics in 1938. His later research pioneered nuclear power generation. See: http://www.invent.org/book/ for this and more information.

TOB: What kind of meeting was it?

LD: I think it was a progress report. The various contractors that were involved and the users were coordinating information. And there was a lot of that.

TOB: Do you know the name of the project? Was it called the Manhattan Project at the time?

LD: Yes.

TOB: It was. And you knew what the purpose was?

LD: Yes. Oh, there was no question as to what it was.

TOB: You and how many other people do you think? Hundreds maybe?

LD: Nationwide?

TOB: Yeah.

LD: More, thousands.

TOB: Thousands, oh that many.

LD: Probably, yeah. We were all cleared for top secret, but even in the very early days it would be hundreds of people couldn't help but knowing. I mean, it was just a foregone conclusion what it must be.

TOB: Why?

LD: Because what else could it do? Well, what else could it do was harden steel. In the very beginning there was no secret about anybody's interest in uranium, and there was virtually no interest anyway. But we'd make no bones about talking to people who were interested in high ballistic penetrating bullets. I can't think of the name that they're called, but, armor-piercing bullets, to think that the German development of uranium steel was the answer, and we and others were working on it. So there was no reason for not talking about it. But the idea of radioactivity being incidental to it was of no importance. When that did become significant, of course they threw total security on the whole thing.

TOB: What year was that, do you think?

LD: Probably '41.

TOB: Forty-one. So you were involved from that early on.

LD: From the very beginning.

TOB: Now, were there questions of the morality or that it wasn't just about building an atomic bomb, or was it not even an issue because it was so new and because of the German threat?

LD: Oh, it passed through our heads but it was not an issue, no. It was only quite later that it began to develop at Los Alamos but the fear that Germany was way ahead of us was so great that it seemed to justify anything. And I think it, by the people that understood it, and they'd be Einstein's caliber, they knew that there was no holding back anyway. And yet here was the natural property of the material and if we didn't develop it, somebody was going to, so it had better be looked into.

RC: Now, you say that there was somewhat minimal questions of morality because of the German threat . . .

LD: In terms of morality I have always felt that it was a wrong decision to use it.

RC: That's what my question was about.

LD: And as it was attributed to Truman, we'll never know the answer. But I don't think it should have been used.

RC: Do you think that the question of morality was not there simply because no one had seen it used and seen the actual effects of it?

LD: That's right. No, even the scientists at Los Alamos working on it were surprised that it worked.

RC: And that it was so devastating?

LD: Yes. Oh, the devastation was way beyond their perception.

TOB: Did you know about the progress up through the testing? Did you know the tests had succeeded?

LD: Yes, and the day that it was tested I knew it, but then it had become public. I mean, used. Wait a minute, do I . . . ?

TOB: You mean used in Japan?

LD: Yes, but I think that my first awareness that it was a product that did what it was supposed to was word that got around after the tests in Los Alamos.

TOB: Most people in the know or everyone, the public.

LD: I don't think the public knew at that time. They didn't know until it was used in Japan. And I think that the anxiety about its being used peaked at that time of the secret test. I think they realized that it was a pretty devastating event.

RC: When it was tested, even so, even that the people who were involved on the inside began to realize to some degree how devastating it could be, they still didn't really have any grasp until it was dropped do you think?

LD: Probably not, no.

TOB: After the war, did you continue to supply uranium to the United States government?

LD: I don't think so. I think our contracts expired long before that because the government had set up their own manufacturing processes. And the plants that were then novel didn't use uranium metal; they didn't build the atomic pile that they had in Chicago. That was mainly for the production of plutonium. There were plants out in the state of Washington that could do that. We were far too small to be adequate suppliers. That was the pressure that we felt all the time: too little, too slow. Even though we made many tons of it, many, many tons were needed.

RC: But the patents you developed, the patents you had and the processes with which you developed it were open to the government? They didn't have to figure that out themselves?

LD: No.

TOB: Did you profit from the whole thing?

LD: No. Oh, well, I, . . .

TOB: You didn't, suffice to say you didn't make a fortune off . . . ?

LD: No, this was one of the criteria of our company which was a privately owned company by the Canadian Mining Company, that it be done at cost. And sometimes we thought that we lost money doing it at cost because of disallowances by the accountants. No, we had no intention of profiting by it. There was no stock available to anyone. The Canadian company owned the whole thing and they did . . .

TOB: Owned what whole thing?

LD: The patents.

TOB: So, why didn't they want to make a profit off of it?

LD: They didn't.

TOB: Wow.

LD: They didn't believe that one should in that kind of endeavor.

TOB: Why?

LD: That, it being done for the government, that was the least we could do.

TOB: Huh.

LD: It's a different philosophy.

RC: What do you think, it had to do with the war time atmosphere?

LD: Yes, entirely. And I'm sure the personality of the owner of the company had a lot to do with it, too. He just felt that we were in the war business and better do everything we could to help. Now this isn't the only contract that we worked on. We had lots of others, military contracts. We made a product for the British Royal Air Force before America got into the war, before we even started the uranium. We had tons and tons of product that we produced for them, and the British Air Force was a buyer. The American Signal Corps was a huge contract of ours. In dollar terms and product terms far bigger than the uranium project. No, we were doing other things, too, at the time.

TOB: When did you become a trustee at Bates?

LD: I can't answer that.

TOB: You can't. Why or how did you become a trustee? Did they call you up one day and . . . ?

LD: No, no, they never do that. The alumni association nominated me and I won the election. Pure miracle.

TOB: Were you honored?

LD: Oh, yes. Surprised, well I was surprised to be asked, I felt it was a great honor. And I felt totally inadequate to the task of being a trustee, but it worked out and I did.

TOB: Where were you living at the time?

LD: In Beverly, Massachusetts.

RC: So, in '53 when you became president of Metal Hydrides, you were in Beverly and you really didn't get the opportunity to see Muskie in particular's rise to prominence in Maine.

LD: No, no. Naturally we followed his career because we knew him, but . . .

RC: So you did try to follow . . .

LD: Oh, yes, through the newspapers and through Bates relationships, and I'd see him at alumni meetings.

TOB: What was he like? How had he changed?

LD: Very well-organized, much in control of himself, not at all pushy or forward or aggressive, you know, but confident and capable and not seeking visibility and sensationalism.

TOB: Did you see him socially at all, ever?

LD: No.

TOB: No, never. You saw him at trustee meetings?

LD: Outside of Bates never socially, no. Most of the contact was at trustee meetings. Once in awhile I had occasion to call him and ask for advice on sticky problems in Washington.

TOB: Now, can you tell us a little more about that? What was your interaction like with him? Why were you calling him specifically?

LD: Because of wondering, under the conditions that prevailed, what alternatives might there be available and how would one select the contact to go along a different path. And usually it was with regard to contractual procedures, legal procedures of, . . .

TOB: With the U.S. government?

LD: ... with the government departments.

TOB: Now, do you remember anything more about these meetings? What was he like? Was he helpful?

LD: Oh, very helpful, yes. I always obtained information that was helpful, if not right then and there on the phone he'd call back or write back or ask me to call him at such and such a time. And he had, a salesman would call it opening the doors. But he didn't do anything that would be construed as competitive advantageous situation for us. But he was interested in the business of government contracts and productivity coming to New England, so he would help where he could.

TOB: Now, did you go to Muskie because you knew him from college?

LD: Yes.

TOB: So he was kind of your "in" when you had a problem with contracts in Washington?

LD: Yeah, I felt that I could be frank with him and trust the answer that he'd give me.

TOB: Do you have any specific examples?

LD: No. It would be mostly at what level should I take a request for reconsideration, let's say, of a contract decision.

TOB: What office do I go to, who should I talk to?

LD: Yes. And within the department that we were negotiating with, I never felt that we should seek some other avenue of contract organization but do, should we live with this decision at such and such a level of decision making.

TOB: When did you move back to Maine?

LD: After I retired in the early '80s.

TOB: Did, here's a question, Bates science education,,, did it, pretty well for your career? You feel that you had, you received a really good education at Bates? Because you obviously took your science very far.

LD: I don't think that one can answer that. Obviously it had a bearing on it and probably a great significance. The, in the last year of physics course at Bates, we spent a whole semester on atomic physics under Carl Woodcock. And at that time this was very, very unusual at any college level, graduate or undergraduate, to delve into it because it was just beginning to open up and very poorly understood. But it fascinated me and I think that had a great bearing on the activities and the uranium project, because that was largely a radioactive material. The influences Dr. Lawrance had obviously were great on other chemical activities. I did learn at Corning Glass Works that I didn't like laboratory analytical chemistry, that I liked more of the engineering type of involvement, the hands-on involvement with production.

TOB: Would you stay with Ed Muskie when you were in Washington?

LD: No.

TOB: No. So you pretty much had a purely business relationship with him.

LD: Entirely, yeah.

RC: Did you ever have an opportunity to see him let his guard down from that business relationship?

LD: No. I . . .

TOB: Never had dinner with him or anything?

LD: No. I was probably quite naive on what some people might do to enhance their relationships, but Ed was not one that you would improve upon your relationship by trying to entertain him or to wine and dine him. The, he had great respect for the conservation of time and respect for involvement. I would do nothing to embarrass him or to try to extend my acquaintance with him through Bates, I suppose, into a social relationship. And he was too busy. And this went with all my contacts as I can remember, that I didn't believe in buying my way into their favor, and I suppose because I didn't need to. Our mission was accomplished without doing that. I did have, and I like to think about it once in awhile, I did have a stumbling block in a contract, and I think it was one with the Signal Corps. And I asked one fellow that I knew quite well and, a government employee, and he suggested that maybe ten thousand dollars spent in the right place might release the log jam. Well, I'd have nothing to do with that. The last time I ever saw him. But the log jam got resolved and we kept our ten thousand dollars. That's the only time I got any indication that you needed to do something to grease the way. Thank goodness.

TOB: Did you go to your fiftieth reunion?

LD: Yes.

TOB: What was it like?

LD: I don't know. What, nice, it was . . .

TOB: That was a dumb question, I'm sorry.

LD: No, no, it was, it was nice. It was awkward from the point that all of us had certain incapacities that we don't remember we ever had or the other fellow ever had. But we enjoyed getting together; were sorry for those that couldn't come, but we did enjoy it.

TOB: Did you spend a good deal of time with Ed at the reunion?

LD: Yes.

TOB: You did. Reminiscing and . . . ?

LD: Oh yes, yeah. I think I probably spent more time during the reunion with the activities that were available than at any other.

TOB: What was the, can you tell us, do you remember anything about your conversations, or . . . ?

LD: They were pretty casual and personal. Everyone was interested in what people were doing at that era, not what had they accomplished in life. We either knew, or it was immaterial. There was no querying of what made you successful because everybody was successful.

TOB: You're a very successful class, I think, all in all.

LD: It was unusual.

TOB: It really was. Everyone in your class seems to have gone to great things in life.

LD: Well, I think it was unusual, but there still are at Bates. But don't forget, we came out at a time when things were beginning to open up after many years of decline. So maybe our class had opportunities open up that didn't exist earlier. I'm most respectful of the problem that your generation has. You're going out into an extremely competitive environment.

RC: One of the things that strikes me the most when speaking to people about Bates in that period is the quality of the professors is the one thing, people say the professors changed their lives. Things like that, that I don't really, . . .

LD: They did.

RC: I don't come across that nowadays. I think there are fantastic professors at Bates and at other institutions, but I haven't really had professors touch me the way some people have said that Bates professors touched them in the '30s. I wonder why that is.

LD: Do you think that it's the background that you come from? Neither one of you are native to Auburn or Lewiston. Maybe you're more worldly wise than we were. But our professors weren't worldly wise, they were pretty localized and restricted by their experiences. But they all enjoyed bringing us along and getting us out of our shell. They were remarkable, all of them. Even the ones whose subject I didn't like did a great job.

TOB: I just have one more question. What do you think Ed Muskie's biggest contribution was to the state of Maine?

LD: Bringing the attention of the state to the world. His campaigning, his public appearances, television appearances, interviews. He gained a lot of respect for Maine, its maturity and its integrity and its stability. He was a powerful personality. Kind of like a rock in the middle of the flood. Even the, his words and the tone of his voice and his approach to people indicated integrity and stability and self-confidence. And he had his own problems, too, yet you never would have known it, political and otherwise.

TOB: Excellent. Thank you very much.

End of Interview

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