THE BECKMAN CENTER FOR THE HISTORY OF CHEMISTRY

OLIVER M. HAYDEN

Transcript of an Interview
Conducted by

Raymond C. Ferguson

in

Wilmington, Delaware

on

18 February 1986

ARNOLD AND MABEL BECKMAN CENTER FOR THE HISTORY OF CHEMISTRY

Oral History Program

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Oliver M. Hayden

(Date) 8 June 1988

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

OLIVER M. HAYDEN

1893 Born in Windsor, Connecticut on 20 August

Education

1914 A.B., chemistry, Clark College

Professional Experience

1915 Salesman, Phoenix Mutual Life Insurance Company, Hartford, Connecticut
1915-1917 Claims Adjuster, Hartford Accident and Indemnity Company
1917-1919 Lieutenant, U.S. Army Sanitary Corps
1919-1926 Chemist, Fisk Rubber Company
E. I. du Pont de Nemours & Company
Organic Chemicals Department
1926-1927 Technologist
1927-1940 Manager, Rubber Laboratory
Rubber Chemicals Departemnt
1940-1948 Assistant Manager, Technical Sales
1948-1954 Technical Sales Manager
1954-1957 Assistant Director of Sales

Honors

1955 D.Sc., Clark University
1958 Honorary Member, Committee D-11, American Society for Testing and Materials
1979 50-year Member, American Chemical Society

ABSTRACT

Hayden begins with his life in Windsor, Connecticut, his academic life at Clark College, and his first employment with insurance companies in Hartford. He served in clinical laboratories and other assignments in the U.S. Army Sanitation Corps during World War I. He joined the Fisk Rubber Company, where he gained experience in rubber compounding and quality control. Hayden then moved to the Organic Chemicals Department of Du Pont, where he worked in screening chemicals for use in the rubber industry, the development of neoprene, and became Manager of the Rubber Laboratory. He moved into Technical Sales management, Rubber Chemicals Division, and became Assistant Director of Sales in the Elastomer Chemicals Department. During the interview he talks about colleagues he knew and friends he made at Fisk, Du Pont and in the rubber industry.

INTERVIEWER

Raymond C. Ferguson obtained his degrees in Chemistry from Iowa State University (B.S. M.S.) and Harvard University (Ph.D). He worked in research divisions of the Organic Chemicals, Elastomer Chemicals and Central Research Departments of Du Pont, principally in molecular spectroscopy, organic structure analysis, and polymer characterization. He is affiliated with DONDUX, Inc., a consulting association of ex-Du Pont professionals, and is a contract oral historian for the Beckman Center for the History of Chemistry.

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INTERVIEWER: Raymond C. Ferguson

LOCATION: Foulk Manor North, Wilmington, Delaware

DATE: 18 February 1986

FERGUSON: Mr. Hayden, you have a Doctor of Science degree.

HAYDEN: It's an honorary degree.

FERGUSON: Did anybody ever call you Doctor?

HAYDEN: I don't bother with that. About the only time I am called "Doctor" is in the American Chemical Society (ACS) literature. They always use it.

FERGUSON: You use the name Bill. How did that arise?

HAYDEN: It's a long story. My father was stone deaf. When I was a little shaver, we were very close. He could read my lips. So when he would go to town to do business, with a lawyer or the bank or anywhere of that sort, he would take me along. I was his ears. People would talk to him, and I would repeat it and he would read my lips. We got along wonderfully. His name was William and in the family he was called Will. Others called him Bill, so the neighbors would say, "There goes old Bill and young Bill." That's the way it developed. That name stuck with me all through my life, and I rather like it.

FERGUSON: From the biography that appeared in the Del-Chem Bulletin on your fiftieth anniversary as an ACS member I know that you were born in Windsor, Connecticut, but I don't have your date of birth.

HAYDEN: It's August 20th, 1893.

FERGUSON: You said your father's name was William.

HAYDEN: Yes. William Owen Hayden.

FERGUSON: What was your mother's name ?

HAYDEN: Kate Maria Mills. She preferred to be called Katherine.

FERGUSON: Your father was a tobacco farmer?

HAYDEN: Yes. He was a tobacco farmer in the Connecticut Valley where they raised the finest tobacco grown in the United States. It's grown primarily for the outer wrap of a cigar. It burns with a very white ash and is a high grade tobacco. When I was a youngster, most of it was grown outdoors. We grew two kinds of tobacco: one was called a broad leaf and the other called the Havana, because the seeds had been brought up from Havana, Cuba. Later on that same tobacco was grown under tents of cloth. The idea was not, as many people say, to protect it from I don't know what. It is grown [under cloth] to filter the light a bit. That way you get a very rather spindly growth but it's the kind of growth you want for the texture for the outer wrapper for a cigar.

FERGUSON: You don't smoke, though?

HAYDEN: No, I haven't smoked since 1951 when I had a bad cough. You can tell from my voice that I still have a residual of bronchitis left over from the days of when I did smoke. I was a heavy smoker. My son-in-law is a doctor. We were at his house and I was coughing. I said to him, "Bob, do you have something to stop this cough?" He said, "I don't know. I'll try." He came back with a little pill. I don't know what it was. He handed it to me and said, "Of course, if you wanted to stop that cough -- it's of no use to talk about it, because you probably haven't got the guts to stop smoking." I was smoking a cigarette; I put it out and never touched a smoke of any kind since then.

FERGUSON: That's Dr. Robert Frelick?

HAYDEN: Yes.

FERGUSON: He used to be my internist. He's kind of a tough nut, too. But he was gentle with you?

HAYDEN: He is a very fine fellow.

FERGUSON: Did you consider staying in the tobacco farming business?

HAYDEN: No. My father had a cousin, Jim Hayden, and I was very fond of the old gentleman. Often, when I was coming home from school I would stop at his house. We would sit and crack a few walnuts and talk to each other, and maybe have some cookies that his wife had made up. We talked a lot. He always drove oxen around the farm. Often I would sit in the back of the ox cart and talk with him.

He had graduated from Yale. He said that there was a great advantage in life if you enjoyed the classics, and if you studied a little bit. He was always telling me that if I could possibly go to college then I should go. My father wasn't very much for going to college. He thought I would be better off staying on the farm. Of course, I really wanted to go to college. So I went to college and I never went back to the farm. Then my father sold off the farm.

FERGUSON: Did your mother have any education beyond high school?

HAYDEN: No. Just until high school. My father went to Wilbraham Academy. That's a boarding school. I think he put in about one semester at Williams College but he had some kind of problem there. I think they were hazing and he didn't like it, so he left.

FERGUSON: You went to public schools?

HAYDEN: I went to a little one-room country schoolhouse. I had the same teacher until I went to high school. Going to high school meant going to ninth grade. I suppose this school had about twenty or thirty children, both blacks and whites. We had quite a black population due to the tobacco plantations. There never was any thought about segregation except that they, by choice, would go by themselves. I never heard about prejudice at all until long after that.

FERGUSON: How far was your farm from Windsor?

HAYDEN: Well, we had two farms. One was three miles and the other was five miles away. One of the farms is now the Bradley Field [Hartford-Springfield] International Airport. As a boy I cultivated that land with horses.

FERGUSON: How large was Windsor, Connecticut, in those days?

HAYDEN: I think the population was about seven thousand.

FERGUSON: Was it a farming community?

HAYDEN: Oh, yes, but there was a place in the center of town called Eddy Electric, which later became part of General Electric. In the outlying village of Poquonock there were a lot of cotton mills, and large sheeting was made there. There was also one paper mill. But Windsor was predominantly farming community. Secondly, it was a bedroom community for Hartford.

FERGUSON: Did you board when you went to high school in Windsor?

HAYDEN: No. For the first year or so I rode horseback. Then the trolleys came through. I used to go back and forth on them.

FERGUSON: Those were electric trolleys?

HAYDEN: Yes. It was the Hartford and Springfield Street Railway. That's long gone.

FERGUSON: Did it pass near the town?

HAYDEN: Yes. It went right through the town. I graduated from high school in 1911. That's the time my father sold the farm. He moved right outside of the town on the main road and built a new home. The trolley car went right by there. Previous to that I went to school from the farm by horseback, or I walked half a mile to the trolley and took it into town.

FERGUSON: What do you recall about your experiences in high school? Did you have science of any kind?

HAYDEN: There were twelve in my high school class. The high school consisted of three rooms. We had a Latin teacher, a German teacher, a physics teacher, and an English teacher. I think the physics teacher also taught mathematics. We also had an instructor for both American and ancient history. We had one of the finest English teachers that anyone has ever had in high school--a wonderful woman and an excellent teacher.

In our class, four of the twelve boys went away to college. One fellow got homesick and came back in about six months. He went to the same college that I went to. Two other boys went to Harvard. One of those boys was Fred Nelson, who later wrote part of the editorial page of the Saturday Evening Post. The other,

John C. O'Brien, was a Washington correspondent for the Philadelphia Inquirer. So, there were two newspaper boys. I went on to Clark and got a Bachelor of Arts in chemistry. I had the usual general, inorganic, quantitative, qualitative, organic and general organic chemistry courses.

FERGUSON: Was Clark a very small college then?

HAYDEN: Yes. Clark was both a college and a university; they had separate presidents. G. Stanley Hall was president of the University, and Edmund Clark Sanford was president of the college. If we wished, we were privileged to audit university courses, and often we did. In the college itself I would judge there were about two hundred and fifty students. There were fifty in my class. We probably graduated about thirty, because it was very stiff. We were supposed to go through in three years. It was a no-nonsense college. We had no intercollegiate activities whatsoever. We had a good many intramural activities. The college was founded by Jonas Clark who was a no-nonsense manufacturer. He thought if you're going to go to college, you'd better go and concentrate on getting an education and not fiddle around with anything else.

We worked hard. Activities were six days a week. Saturday was the same as Monday, Tuesday and Wednesday. We did a lot of work and often went back on Sunday mornings to do our laboratory work.

FERGUSON: Did the university offer graduate degrees at that time?

HAYDEN: Oh, yes. It may sound a little boastful, but it was one of the leading universities in the United States. It was recognized all over the world for psychology. They had lectures by such eminent psychologists as Sigmund Freud and Carl Jung. Since my time at Clark University they have developed a very strong department for graduate study in geography.

FERGUSON: Did any of these people visit the campus while you were there?

HAYDEN: No. As I remember, I audited some lectures but I don't remember which ones. Freud came, but I can't remember if it was just before or just after I was there. I always heard great tales about Freud.

FERGUSON: How did you decide to major in chemistry?

HAYDEN: They didn't teach any chemistry in my high school. I had pretty good courses in physics, and I just had a natural curiosity about the other methods of science. I wanted to find out about chemistry. Once I was in it, I got very much interested and especially loved the laboratory work. There weren't very many written examinations. The school was actually run very much like a European university. I would be working in the laboratory at the bench and a professor would come up to me and say, "What are doing this morning, Mr. Hayden? Why are you doing this? Tell me about it?" I would be talking to him for about a half an hour, with him quizzing me.

Then he would say, "How would you like to come over to my house and have doughnuts and coffee tonight?" Once you were at his house, that was your oral exam. He would invite two or three of the fellows in the class. We would sit down and talk. He wasn't satisfied until you absolutely understood what you were doing. It was very helpful finding out what you knew, what your weak points were, and what you should be doing. It was very unusual.

FERGUSON: Did this mean you really didn't have a formal laboratory program as such?

HAYDEN: Oh, yes. We had a formal laboratory program. You had things to go through. You might be following the book, but that didn't mean you knew why or what you were doing. He would find out if you knew what you were doing. It was a very helpful way.

FERGUSON: You had subjects like qualitative chemistry and quantitative analytical chemistry?

HAYDEN: Yes, the usual. We didn't know much about atomic chemistry or nuclear chemistry. It wasn't heard of. I remember my textbook was Organic Chemistry by Ira Remsen of Johns Hopkins (1). It was a book about an inch and a half thick. That was about all they knew about organic chemistry.

FERGUSON: In those days organic chemistry was probably pretty much oriented towards agricultural chemistry.

HAYDEN: That's right. We did have a shelf of Beilstein for reference because most of the organic chemistry was done in Germany.

FERGUSON: Do you remember any of your professors?

HAYDEN: I should remember them very much.

FERGUSON: Is there anyone who had a particular influence on your goals?

HAYDEN: I remember Dr. Benjamin [Benny] Shores Merigold, who was our inorganic professor and a great inspiration to all of his students. He was a Harvard graduate.

FERGUSON: You received an honorary doctoral degree from Clark University in 1955.

HAYDEN: I got it more for the work that I was doing through the American Society for Testing & Materials [ASTM]. I was very much interested in getting standard quality and performance tests that could be used to make rubber products that would suit the Automotive Society of America. I did a lot of work in cooperation with them. I have always thought that it was a result of that work that I was given the Sc.D. from Clark.

FERGUSON: It seems to me that a lot of your career was hidden.

HAYDEN: I graduated with a major in chemistry. I never considered myself as a real chemist, but I was associated with chemistry. Actually, my work in rubber in the early days was more art than science. Later on it developed as science. I was always interested in the performance of synthetic rubber and developing needed qualities, if we had some particular requirement to meet in industry.

FERGUSON: When did you graduate from Clark?

HAYDEN: In 1914.

FERGUSON: That was just as World War I was beginning.

HAYDEN: When I graduated in 1914, jobs were mighty darn scarce. I had been not feeling too well. When you were graduating then, the thing to do was take out a thousand dollars endowment insurance policy to give to the college as part of their endowment.

When I came up for my examination, it was found that I had rather serious kidney trouble. As a matter of fact, they told me

I had better go home to die. As a result, I could never get life insurance. All that I could ever get was the GI insurance. I had what they called acute albuminuria. I was home in bed for some time, and I had a complication with rheumatic fever. It all turned out to be due to my tonsils. I had a strep throat and strep tonsils. Once my tonsils were removed I regained normal health.

I didn't know what to do for a job. I was somewhat interested in a job in Michigan with the Michigan Telephone Company. Instead, I took a job with the Phoenix Mutual Life Insurance Company in Hartford and worked there for about six months. Then, I shifted over to the Hartford Accident and Indemnity Company. I worked there as a claims adjuster until the war broke out.

I joined a group [of volunteers] from Hartford, and that was the start. Actually, before we got into the hostilities ourselves, we were thinking about organizing an ambulance squad with the Red Cross and going overseas. Instead, when the war came in April, that same group went into the medical department. We were all sworn into the Army in August of 1917, the whole kit and caboodle of us.

FERGUSON: This was a group of Hartford employees?

HAYDEN: This was a group of young people from Hartford. The nucleus actually came from the University Club in Hartford. It was always called Dr. Otto Wiedeman's group. We were called to duty in August 1917 and were shipped to Fort Ethan Allan. That was the Second Cavalry headquarters.

Then they brought in the Vermont National Guard, but we were still kept as a more or less independent group, except that we were under the control of the Second Cavalry. One of their colonels was our commanding officer. They went through all of our qualifications and we were sent to a newly formed hospital in Augusta, Georgia. It was to serve the 28th Division of the Pennsylvania National Guard. We were not a recruiting station, but we were where the Southern draftees were sent for indoctrination and proper training.

FERGUSON: It was called induction and basic training?

HAYDEN: Yes. We had over sixty thousand troops coming in. At first, they put us in the wards of the hospital. Then I moved out into the clinical laboratory and worked there for about a year. During that time I had the flu and recovered from it.

One day in September 1918 I was called into the colonel's office. He told me that I was a commissioned officer

and was going to be sent to Yale. I went there to take a course in toxicology. It seems the Germans were on the retreat and were poisoning water supplies. I had a group that was organized in San Antonio, Texas. It was a mobile laboratory, actually on motorcycles. There were cases on the motorcycles that contained whatever apparatus you might need for the tests.

We were all assembled at Hoboken [New Jersey] when the armistice came. The ship was there, but we never got on it. It was the old Crown Princess Victoria. We were shipped to Camp Crane in Allentown and from there to a base hospital in Otisville, New York. I was located there for about one year. We had all kinds of jobs to do. It was called the Sanitary Corps, U.S. Army.

We did everything, helping control the quality of the water, doing some work on sewage disposal, and doing all sorts of clinical laboratory work. I was in that until I was discharged in October of 1919 at Fort Adams in Narragansett Bay, Rhode Island. Meanwhile, I had married in April of 1919.

[END OF TAPE, SIDE 1]

FERGUSON: You did, in fact, take advantage of your chemical training in the army?

HAYDEN: Yes, but it was clinical work, which I enjoyed very much.

FERGUSON: Your wife's name is Dorothy. What was her maiden name?

HAYDEN: Clark. Dorothy Lucille Clark. She would like to forget the Lucille. She did not like it.

FERGUSON: You knew her from childhood?

HAYDEN: I knew her from the time she was four years old.

FERGUSON: That's a long courtship.

HAYDEN: Well, it just so happened that we went to the same church. She came there as a stranger. I remember she came there as a little girl,and was quite a stunning girl. I can remember exactly how she was dressed. I didn't see much of her until we got to high school. She was a class behind me. Then we renewed our acquaintances. We used to go with a crowd. You never had a girl you went steady with. We would always go out as a group,

either canoeing or swimming or riding. After high school, her mother was sick, so Dorothy spent a year at home. Then, she went to Smith College and graduated in 1917. I used to see her when I came home from college, during the summertime or vacation.

Then I went into the Army. I guess, in absence, you think more about the folks back home. We just took it for granted that we would be married. That's all there was to it. Of course we arranged it, and I got a leave of absence for three days, from Friday morning until Monday morning. I went from Otisville, New York, over to Windsor and we were married. Coming back to New York, that one night was our honeymoon. I was back at the camp the next day. That was it.

FERGUSON: What was her major at Smith?

HAYDEN: It was German with a minor in mathematics. It was there that she could acquire college credits for studies in the history of art and painting. She loved to paint and attended classes in painting in childhood. These paintings on the walls of this apartment are all hers. That one is of the New England farmhouse where I was born and raised.

After graduation from Smith in 1917, she got a job in the actuarial division of the Phoenix Mutual Life Insurance Company in Hartford, Connecticut. She worked there until we were married in 1919.

FERGUSON: When did she paint the farmhouse?

HAYDEN: Probably twenty years ago, from a photograph and from memory.

FERGUSON: Is the farmhouse still there now?

HAYDEN: No. Unfortunately, it burned in 1936.

FERGUSON: You were discharged as a first lieutenant ?

HAYDEN: No. I was a shave-tail, a second lieutenant. Then I stayed in the reserves for five years after I came to Wilmington.

FERGUSON: Did the reserves take quite a bit of your time?

HAYDEN: Yes.

FERGUSON: Did you have to go for two weeks training every year?

HAYDEN: No. All evening seminars but it kept interfering with other things. After I was promoted to First Lieutenant in the U.S. Army Reserve, I took an inactive status for about five years. I developed other interests and, after my term ran out, I just quit.

FERGUSON: I would like to talk about your family. I know your son was killed in an automobile accident and your daughter's name is Jane.

HAYDEN: Our daughter graduated from the Friends school in Wilmington. She went to the public schools until high school, and then she went to the Friends school. She went to Oberlin, and had in mind that she would study medicine. She was dissuaded from that. She was told she was too sympathetic and would take her cases too personally. So, she went to Yale Nursing School and graduated with a B.S. in nursing.

She practiced nursing at Yale at Grace Memorial Hospital for some time. She became supervisor of nursing. She met Bob Frelick when he was a senior at Yale Medical School, and they were married. He went into the Army and she came to Wilmington and stayed with us a short time.

FERGUSON: Was this during World War II?

HAYDEN: Yes. After graduation from Yale Medical School and an internship at Grace Hospital in New Haven, Connecticut, he was commissioned Captain in the U.S. Army Medical Corps and assigned to the Amy Madigan Hospital at Fort Lewis, Washington, near Tacoma, where he was a triage officer. Jane went out there with him, expecting that he would soon be sent out for duty in the Pacific, but he was sent to Germany. By that time their daughter Susie was born, so they all went to Germany. He was in Munich and Jane in Heidelberg until the war ended. I think Jane was in charge of the clinic in Heidelberg. After the war was over there were a good many civilian people there. He became the doctor or family physician for many of the American families in Munich. Afterwards they returned to Wilmington.

FERGUSON: Was Jane in the Army Nurse Corps?

HAYDEN: No. She was a civilian employee for the army.

FERGUSON: You have five grandchildren?

HAYDEN: Yes, five. Do you want to know about them?

FERGUSON: Well, we can discuss them quickly.

HAYDEN: The oldest one is Susie. She graduated from Western Reserve and married a fellow by the name of Wooley. For a while he was the business administrator of a hospital in Highpoint, North Carolina. Now he is the administrator of Harrison House, a nursing facility in Georgetown, Delaware. Susie worked at the medical school at Duke for a little while, and became somewhat of a specialist with the electron microscope. She has two children, one adopted. She went to Temple on weekends and at night and received her Ph.D. in Health Education 1987. She is now a writer of science texts for elementary schools.

The second girl, Aicy, went to Clark. In her third year she disappeared, as so many of the people in the sixties did. She became a hippie. She always kept in contact with me. I always knew where she was but I seemed to be the only one in the family who did. I guess it was because she thought I was an old roué and was the only one who was sympathetic towards her. After about a year of running around like that, she found out she was being used. We had given her an automobile and that had disappeared. We gave her a typewriter and television and they had disappeared.

She finally got sick of the whole thing and went to Boston. She got a job working for the Quakers in a place where old clothes were brought in and laundered, looked over and mended. Then she realized that she had been foolish, so she went to the University of Massachusetts in Boston, where she got a B.A. She became interested in international affairs and went to the School of International Training in Brattleboro, Vermont, and received an M.A. Then, as most of the children did in those days, she got interested in the Peace Corps and went to Germany for some reason. When the earthquake happened in Guatemala, she went down there for the Red Cross and was there for quite a while. Then she was sent--I think it was through the Peace Corps, but I was never quite sure about it--to the South Pacific, and was responsible for about five thousand Cambodian refugees. She came back from that and was sent to Afghanistan. I think that was under the Office of the State Department through a recommendation from the University of Southern California. She was actually on the faculty of USC. She was quite fluent in languages and became very fluent in Parsee. After she finished her first year she was asked to translate a technical book from English into Parsee. She stayed there an extra year for that.

When the Russians came in, she was living next door to the

palace. I said, "What did you do when they started bombing the palace?" She said, "I got down under the dining room table and stayed there." The next day she was flown out by a military plane. Through that she got to know people in the State Department. She took special training with the State Department and now she's now a counsel in the embassy in Kuala Lumpur in Malaysia. She's had quite a life and she loves it. She is now in the embassy at Katmandu, Nepal.

The third one, Sally, went to Beloit College in Wisconsin and became interested in urban affairs. After graduation in 1974, she attended the University of Pennsylvania and received an M.R.P. degree in 1978. Then she and another girl traveled through Yugoslavia and other countries in that area. Finally, she visited an uncle who was in the Peace Corps in Kenya. The girls got a panel truck and drove across Africa. She met a young fellow from New Zealand while traveling. They are now married and living in Wilmington. He's with Dean Witter, and they have three little children.

Then there's a boy, William Frelick, who went to Oberlin where he was a Phi Beta Kappa. He married a girl from Wilmington. They were both at Brandywine High School. She wanted to get into a medical school, but could not get admitted. Finally, New York University allowed her to attend the University of Israel, and granted her an M.D. degree from the NYU Medical School. She did her internship and residency in psychiatry at the University of Maryland Hospital in Baltimore.

My grandson, her husband, went to Jerusalem with her and got a job teaching English to students in the American colony. He became interested in Amnesty International and is now a policy analyst with the U.S. Committee on refugees at Washington, D.C. international amnesty. He is with some organization in Washington that has to do with civil rights in other countries. I don't want to get into it because I don't know enough about it.

The second boy, Scott, the youngest, was spoiled by too many brothers and sisters. He was very allergic to books and just got through Brandywine High School. He's now living in Los Angeles, working on a number of projects. I can't keep up with what he is doing. He's an entrepreneur.

FERGUSON: Let's now return to your career. After you got out of the Army, you went to work for the Fisk Rubber Company.

HAYDEN: Yes. I had a friend who knew someone at the Fisk Rubber Company. So he called and said, "I know a young fellow who just got out of the Army. He's a college graduate who needs a job." So the Fisk fellow said, "Send him up here. We'll either make him or break him." I went up there and started at the bottom of the ladder. I started at the bottom job of the production line, which was to prepare the crude rubber for processing into inner

tubes and automobile tires. I progressed through milling and calendaring to tire building. Finally, I was promoted to a job in the laboratory. I was very happy to get this promotion, where I was soon assigned to quality control and then compounding.

FERGUSON: I don't remember whether Fisk is still in business.

HAYDEN: No. Their trademark exists, but they were bought out by U.S. Rubber, now Uniroyal.

FERGUSON: How large was Fisk when you joined them?

HAYDEN: It was one of the big five. We made 32,000 tires a day, 32,000 inner tubes a day, 12,000 bicycle tires a day, and maybe two or three thousand hard rubber battery casings a day. We made almost anything that had to do with the automotive industry.

FERGUSON: What did you do in the laboratory?

HAYDEN: I was doing routine analyses of compounding ingredients. From that I went into quality control and then into compounding. There were three of us chaps at about the same level. Two of us had been in the army. The one who hadn't was there first. Then the chief chemist told the board that, through research, they had found the "alpha and omega" in accelerators. He didn't think it was necessary to do any more research. I think they fired him on the spot.

FERGUSON: You mean the board didn't agree with this?

HAYDEN: No. We three cubs were called up. I remember Harry Fisk said, "Will you cubs take a gamble?" I think that's the word he used. "Do you cubs think you can handle that job for a little while? If you think you can, we'll hire all the help you can possibly want in the way of advisors or experienced people." So, we split the job up in quality control and manufacturing and going out in the field to check on quality. We had quite an experience there for a while.

FERGUSON: Was Harry Fisk the president?

HAYDEN: He was the treasurer and a member of the Fisk family. That was about all I ever knew about him. I think I met him just a few times, but he gave us boys a start.

FERGUSON: At that time were you the scientific staff?

HAYDEN: We were the whole business. We had control of quality and control of service. We did all of the compounding. Through that the three of us all got a great deal of general experience of the art of rubber compounding. I say it was art, because an awful lot of it was trial and error all the way through.

FERGUSON: What was the understanding of polymers at that time?

HAYDEN: I don't think the term polymer was in use. That was 1919. It was the beginning of the use of organic materials. Previous to that time, the only accelerators were several lead oxides, white lead, and red lead. Then, the first accelerator that came was red oil.

FERGUSON: What was the theoretical understanding about what natural rubber was and what the curing did?

HAYDEN: Well, about all that we knew was that you had to have sulfur. You could even out a lot of quality by using a little stearic acid and zinc oxide. We had Lothar Weber, who was supposed to be an expert in the chemistry of rubber. I say chemistry, but put "chemistry" in quotes, because there wasn't much. I guess he was supposed to be the leading man in the world (2). He'd come down from Cambridge and spend Friday afternoons with the three of us going over our quality problems.

FERGUSON: Weber was a consultant?

HAYDEN: Yes, he was.

FERGUSON: Was he at the chemistry department at Harvard?

HAYDEN: No, I don't think so. I don't know what his background was. His father had been internationally known as a rubber chemist. Every time I say rubber chemist, I say it reservedly, because it was darn little chemistry. It was mostly art based on experience from trial and error.

FERGUSON: How was the sulfur cure discovered?

HAYDEN: Goodyear discovered it.

FERGUSON: Do you remember when?

HAYDEN: That was in the 1830s.

FERGUSON: So when you were at Fisk nearly ninety years had elapsed.

HAYDEN: All we knew about curing rubber was that you needed sulfur. A little stearic acid was good and zinc oxide was also good. That's about all we knew. I can remember we also used zinc oxide and clay as reinforcers. Then carbon black came into use. I remember very much when the first carbon black was used. We heard about it and, with trepidation, we substituted seventeen parts by volume of carbon black in our automobile tire treads. Previously the Fisk tire was really very famous. It was a zinc oxide tire tread covered with iron oxide. It took just a little bit of iron oxide to give it a red color.

FERGUSON: I think I've seen pictures of some of those old tires, but I didn't realize it was due to iron oxide.

HAYDEN: That's what it was. There were a lot of tires that had white treads. Then they began to put a little bit of carbon black in them.

[END OF TAPE, SIDE 2]

FERGUSON: Didn't you make special tires for individuals?

HAYDEN: There were some personalities who wanted a special tire. We would have a mold made and engraved. For example, we made a mold for Theda Bara. If the tire went down the road and happened to hit a little moisture, it would print Theda Bara - Theda Bara - Theda Bara in the road. As I recall it, that was a green tread with a yellow sidewall. We also made them for Douglas Fairbanks. There were a lot of people, particularly those in motion pictures, who wanted something very special.

FERGUSON: Now, this would be the early 1920s. What year did you start using the carbon black?

HAYDEN: It must have been in the very early 1920s, probably around 1922.

FERGUSON: I heard a story that Goodyear was trying to make a

really cheap tire. When he put in some ground shells or carbon black or something like that to reduce the volume of rubber he was surprised to discover the reinforcing properties.

HAYDEN: I do not believe there were any tires made during the lifetime of Charles Goodyear.

The early pneumatic tire tread often contained clay or zinc oxide as rubber reinforcers, but the use of clay was soon abandoned because it made the composition very difficult to adhere to the carcass of the tire. Then zinc oxide was adopted, and that worked out very well. Then carbon black came out. As I recall, the first carbon black tread I ever saw was made by the Republic Tire Company in Pennsylvania. It was called a "Barefoot" because it had quite a soft tread, but it improved the wear. The use of carbon black continued to increase and, of course, now a great deal more carbon black is used than when I was there. In fact, I think that after I got out of it, the use of carbon black increased greatly. Then synthetic rubber came along. More and more carbon black was used -- not to dilute the rubber, but to give it reinforcement for wear.

FERGUSON: You went from Fisk to Du Pont. Why did you make that change?

HAYDEN: At Fisk we were using this anhydrous formaldehyde/ para-toluidine accelerator that the chief chemist had said was the "alpha and the omega". We were buying it from Atlantic Dyestuffs in Portsmouth, New Hampshire. Du Pont was getting into the organic chemical trade. One of their salesmen, J. Warren Kinsman, talked to our purchasing agent, because Du Pont wanted some of the business. We split the business and bought some from Du Pont. When one of the early shipments came in, it was nothing but presscake. When the drum was opened and tipped over, nothing but water came out. That spoiled Christmas for us three chaps. We stayed there and tried to wangle through and get it in shape, so that we could use it until the replacement arrived. That was very embarrassing to Du Pont.

Of course, we started to buy more and more Du Pont products. Several years later, Ernest R. Bridgwater, who was then representing Du Pont, told one of the fellows, Cliff Sanderson, that they were looking for someone with experience in tires and general rubber compounding. They wanted him to come to Wilmington, to see if there were any products in the dye works that could then be used in the rubber business, and to service the chemicals if they had them. One of the other chaps said that he didn't want to come down, because he wanted to stay with Fisk. They asked me if I would come down, but I didn't know very much about Du Pont. I remember going home and asking my wife if she would like to go down to Du Pont and she said, "Who's Du Pont?" This was the general attitude around New England. Nobody had heard of Du Pont.

So I came down here to the Rubber Laboratory, which consisted of one other fellow who had had some experience in rubber. He was from the Lee Rubber Company, and they wanted him to go out to Chicago in sales. He went out there and and I took over. That was in 1926. The lab hadn't been there too long.

FERGUSON: Did the Rubber Lab start in 1922?

HAYDEN: Yes. The rubber lab was operating when I went there in 1926. I wish I could remember the name of the first person in charge. He was later hired by Rubber Service Laboratories in Akron, Ohio. They sold recipes and processes. He was the first one. Then there was another chap who went to New York City as a salesman. He was followed by Sidney Weller, who came from Lee Rubber. When he went to Chicago, I came in and took over. Soon we began to find chemicals that could be used for compounding. We began to expand and hired more and more people.

FERGUSON: When you came to the Rubber Lab, how many people did you have working with you?

HAYDEN: I was alone as a compounder for a short time. I think there were three or four others in the laboratory doing the testing work.

FERGUSON: Were the early compounding recipes proprietary?

HAYDEN: A typical recipe for an automobile tire would be based on one hundred parts of rubber, five parts of sulfur, three to five parts of zinc oxide and stearic acid, and maybe forty or fifty parts of carbon black. That was about it.

In the early days an inner tube was made of one hundred parts of rubber and ten parts of sulfur. Later on, we began to put in organic accelerators to speed up the vulcanization process. Of course, those were the days when an inner tube was made in a circular mandrel and stripped off. Then the ends were buffed and the rubber cement was painted on. It was painted with a little sulfur chloride and stuck together. You just hoped to God that the thing would last until you could put it in a tire.

FERGUSON: You said you found some organic chemicals from the Dye Works?

HAYDEN: Of course they had this anhydrous para-toluidine and we

acquired hexamethylene tetramine through the Restler and Hess Locker, Inc., which Du Pont bought out. Then we found di-ortho-tolylguanidine at the same time that Dow was getting into it. It became highly competitive. I think the real find we had was phenyl α-naphthylamine, which is an antioxidant. Then we found that we could buck it up by adding other materials to it.

FERGUSON: Did you get patents out of this work?

HAYDEN: I think patents were taken out on the secondary amines (3). Goodrich also came out with phenyl ß-naphthylamine. We had phenyl α-naphthylamine. They were most commonplace organic accelerators. Everybody knew about aniline mixed with aldehydes. A long series of amine and aldehyde combinations worked well as accelerators.

FERGUSON: Did you get into peptizing agents?

HAYDEN: Yes. That was the work of Ira Williams. He was the fellow that really got into peptizing. He was a pioneer in that.

FERGUSON: What was the Chambers Works like when you went to Du Pont?

HAYDEN: Well, it was a hodgepodge of pipes and smells.

FERGUSON: At that time was it the largest organic plant in the United States?

HAYDEN: Yes, it was. In the old days we used to go over [from Wilmington to New Jersey] on the company ferry. You had to get off the ferry and walk nearly half a mile down the sea wall. It was pretty tough going there on a cold day, with the wind blowing off that river.

FERGUSON: I remember tales of that. The bridge was built just before I got there. You couldn't persuade Dorothy to live in Penns Grove?

HAYDEN: No. She was glad to live over here in Wilmington.

FERGUSON: Most of the technical people seemed to have lived in Wilmington and took the ferry over. Is that right?

HAYDEN: Yes.

FERGUSON: Chambers Works had the dye works and tetraethyllead?

HAYDEN: When I first came to the dye works on this job, the Rubber Lab was not a separate entity. We were a part of Technical Laboratory. My boss was Dr. [Robert E.] Rose. When I went in to report to him he said, "Hayden, I don't know the first thing about rubber. You don't know the first thing about dyes. Let's call it quits. You tend to your end. I'll tend to my end. If you get in trouble, let me know and I'll try to haul you out." [laughter] That was my introduction. Did you ever know him? He was a very fine man.

FERGUSON: I recognize the name, but I think he must have moved on by the time that I got there. Was Du Pont in tetraethyllead at that time?

HAYDEN: They were in it when I came, but in a small way. I remember one or two of the rubber chemists at Jackson Laboratory had been in tetraethyl, but they got out of it because some of them had a little touch of lead poisoning.

FERGUSON: I think Dr. Frederick B. Downing had gotten his lifetime exposure.

HAYDEN: Yes. Fritz was one. Names just escape me. I can see them in my mind.

FERGUSON: I do too. Was there a close interaction between Jackson Lab and the Technical Laboratory?

HAYDEN: Oh, yes. I was much closer to Jackson Lab than I was with Tech Lab, because they were doing a lot of work over there in rubber chemicals. I was working over there chemicals with people like Bill [William S.] Calcott, Bill Douglass and Don Powers. So I spent much more time with them.

FERGUSON: Had Newport Chemical Company been acquired by then?

HAYDEN: No. That was much later.

FERGUSON: You've written about Neoprene and I have a pretty good understanding of how you got involved. Were you the person

who learned how to compound Neoprene?

HAYDEN: Sure. I found that from the very first piece I ever had. I used rosin and magnesia. I found that they were quite essential. Now, you could use zinc oxide in place of magnesia, but you would get in trouble because it vulcanized so fast.

FERGUSON: Really?

HAYDEN: It was much more active.

FERGUSON: Chemically, what do the oxides do? Do they react with the chlorine?

HAYDEN: I suppose that's what happens. And, of course, carbon black was essential to control it.

FERGUSON: What do you think your major contributions were?

HAYDEN: Of course, I think the first thing was finding out what the essential things were that you needed for processing and vulcanization--rosin and magnesia. After that, in the compounding and leading a group of men to compound for specific purposes. For example, compounding for the covering of secondary distribution electrical power lines. In the early days, you could go down the road and see the rubber insulation streaked off and hanging in the wind. That was one of the first things, because we found that Neoprene was very resistant to sunlight, if it was compounded with carbon black.

One of the very first experiments that we ever made at the Roebling Company in Trenton, New Jersey, was to cover wire with a Neoprene composition. In compounding for that particular job we had to add softeners for extrusion purposes, and various compounding ingredients to give some special properties.

Then, there was the compounding for sidewalls of tires, which has always been a good use. There was compounding for many rubber parts of an automobile, such as a hose to carry solvents. For hundreds of different products we had to think about the use, and try to compound something that would work.

FERGUSON: At the same time, there was research and development on the manufacture of Neoprene. Were you directly involved in that?

HAYDEN: Only in the evaluation of the products that were being brought out. For example, as you know, the first Neoprene was made in five gallon bottles. Chloroprene was put in five gallon bottles subjected to actinic [Cooper-Hewett] lights. You got a syrup and drowned it with alcohol. The polymerized product that was still elastic was pulled out and cleaned up.

FERGUSON: Did the people who were doing the work on polymerization understand what they were doing? Did they have any conception of free radical polymerization?

HAYDEN: I think Ira Williams did.

FERGUSON: Was he an organic chemist?

HAYDEN: He came to us from Grasselli. He had put together an accelerator. The 808 and 833 were two accelerators that he produced. They were aldehyde-amine products. When he got here he was given some Neoprene and started working with that. He really got into that. He loved it and worked at it. I think he knew what he was doing.

FERGUSON: Did he come first to Chambers Works?

HAYDEN: He was assigned to us in rubber, because he had been working on rubber chemicals for Grasselli in Cleveland. So it was just natural that he came and worked into rubber at Jackson Laboratory. We worked very closely with him.

FERGUSON: I think it was Howard Starkweather who did the first successful emulsion polymerization.

HAYDEN: Yes. Howard worked with [Wallace] Carothers for a little while. Howard contributed a great deal.

FERGUSON: You probably didn't talk in those days about free radical polymerization.

HAYDEN: I never heard of it. As a matter of fact, Howard Starkweather contributed a great deal to the study of polymerization. I think he knew what he was doing. He and Ira Williams. Of course, there were other chaps at Jackson Lab who were involved in it too.

FERGUSON: How long were you were involved with Neoprene at the Rubber Lab?

HAYDEN: Until 1941, when they built the plant in Louisville and I came over to Wilmington.

FERGUSON: Were there other things going on at that time that were important in your mind?

HAYDEN: Other polymers like Viton that were coming along. One of the most interesting synthetic rubbers was called "Adiprene".

FERGUSON: Let me switch to a brief history of your career at Du Pont. You were head of the Rubber Lab at the Chambers Works from 1926 to 1941. Then you went to Wilmington as assistant manager of Rubber Chemicals?

HAYDEN: Yes, in the division of Orchem [Organic Chemicals Department].

FERGUSON: In 1954, you were assistant director of sales. In 1956, you were special assistant for sales in the Elastomer Chemicals Department.

HAYDEN: With the kind of work that I was doing I always felt that I was really more like a technical sales manager than anything else. I had some concern about that. I was assistant to Ernest Bridgwater, who was two or three years younger than I. Jack Dailey was general manager. I went to Jack and I said, "Listen. You have to do something about this organization. Here I am as Ernest's assistant, the man you might want logically to push along if you ever moved Ernest up. You have to find somebody to be his assistant, because I'm older than he is. I'll be going out of here before he does. Therefore, I think you ought to do something about it." That's when I became the special assistant. I felt very strongly that I shouldn't keep that spot, because if something happened to him, I was too old to move up.

[END OF TAPE, SIDE 3]

FERGUSON: After your Neoprene work in the Rubber Lab, what other important things happened at Chambers Works.

HAYDEN: I still had to spend a lot of time at the Chambers Works, handling rubber chemicals, being sure that we had the

proper quality and were making what the industry wanted.

The same thing was true with organizing the quality group in Louisville to maintain the day-to-day quality of the Neoprene as it was made. That was very important. That was all under the same group. Although that came under manufacturing, we felt responsible for the personnel there and the quality of the work they were doing.

FERGUSON: Somewhere during that time, did you build a separate rubber laboratory?

HAYDEN: That one was built in Akron, Ohio, as a service laboratory. It was manned with experienced people both from here and from industry.

FERGUSON: When I was at Chambers Works, Rubber Laboratory was separate from Technical Lab.

HAYDEN: Yes. I forget what year that was. We became a Rubber Chemicals Division. The laboratory was set up independently.

FERGUSON: I made a list of some of the polymeric products and inventions that became subsequently commercialized. Did you have anything to do with butacite resin or sheeting?

HAYDEN: No, not a bit.

FERGUSON: That was in the Ammonia Department?

HAYDEN: Yes, that's right.

FERGUSON: Since you were in the Rubber Lab you were probably familiar with Cordura rayon tire cord.

HAYDEN: Yes, but our interest was in the adhesive that was put on the cord, so that the rubber or Neoprene, or whatever you were going to use, would stick to the cord.

FERGUSON: Was Textile Fibers developing that?

HAYDEN: Yes.

FERGUSON: They worked with you, though?

HAYDEN: We did a lot of evaluation work on it, but they worked with industry quite a bit.

FERGUSON: What about Teflon?

HAYDEN: We had nothing to do with Teflon. That was the Freon group and we never had anything to do with that.

FERGUSON: People at Jackson Lab tended to move back and forth from group to group. Didn't some of the dye chemists end up in Rubber Lab?

HAYDEN: If I could see a list of names I could probably tell you who did what.

FERGUSON: You did mention Adiprene earlier.

HAYDEN: Oh, yes. Adiprene was a good product. The only trouble was that it was difficult to get something to adhere to it. Secondly, it would fail under heat. For example, you perhaps heard the classic story. They built some tires with Adiprene tread and they wore wonderfully until they made a panic stop--wssh!

FERGUSON: I was on the Adiprene task force when I came here in 1953. The project was killed about 1954.

HAYDEN: It was an awfully good product. Well, that piece there [a coaster in Hayden's apartment] is quite a few years old, but it is about as good as it was when it was made.

FERGUSON: Dr. Harold Elley commented to me that when they started out, the price of natural rubber and GRS was something like twenty or twenty-five cents a pound. Now I think it's fifty cents a pound.

HAYDEN: Natural rubber was three cents a pound when we tried to

get into the market.

FERGUSON: When was that?

HAYDEN: In 1932.

FERGUSON: Okay, Neoprene was going to compete with natural rubber?

HAYDEN: Yes. I think Neoprene cost us five dollars and we sold it for two and a half a pound. Rubber was selling at three or three and one half cents.

FERGUSON: How much were you involved with Adiprene?

HAYDEN: Only in evaluating it.

FERGUSON: What about Hypalon?

HAYDEN: Hypalon came over to us from the Experimental Station. At first it was very difficult to process. Until you had something that you could process on conventional rubber machinery, you wouldn't get the industry to accept it. About the time I left, they were beginning to improve the quality of it so that it could be handled and processed. Now, I guess, it's really a good commodity.

FERGUSON: I don't know.

HAYDEN: It was just in the early days of evaluation. If you got it into a product, it was very efficient and had a lot of good qualities. At the time that I left it was still impossible to really process it.

FERGUSON: What about the Spandex fiber that came out of polyurethane research?

HAYDEN: We had practically nothing to do with that.

FERGUSON: What about Nordel hydrocarbon rubber?

HAYDEN: Yes, I know of Nordel, but it was not an important factor to me. These things were mostly after my day.

FERGUSON: You made a European trip to I. G. Farben and Imperial Chemical Industries in 1936.

HAYDEN: Yes. Did you ever see my report (4)?

FERGUSON: I have the report and I did look through it. It raised some interesting questions. First, how did this trip come about?

HAYDEN: The Germans very obviously knew that they wanted to prepare for war. They knew that if they were going to have war, they had to have a rubber. They couldn't very well depend on natural rubber, because they couldn't hoard enough to carry them through any extensive war. They knew how to make butadiene polymers, but where were they going to get the raw materials? They didn't have much oil but they had plenty of coal.

When they heard that we were making rubber from acetylene, their ears perked right up and they wanted to make a swap. They wanted to swap their butadiene-styrene rubber technology. They were willing to make some kind of commercial swap. They could have the Neoprene and we could have the butadiene. I went over there to demonstrate to them the quality of Neoprene, and to show what you could do with it. I was to take a good look at their butadiene product. That's why I went to Germany.

I also went to England and made the rounds of all the rubber companies over there, showing them Neoprene and what they could do with it.

FERGUSON: You actually went in and compounded with them and helped them to evaluate Neoprene?

HAYDEN: Oh, yes. They were very cooperative.

FERGUSON: What was your feeling about the political atmosphere during this trip?

HAYDEN: We went over on a German ship, the Bremen. Dorothy was with me. We were treated very, very well because they wanted something. I'm sure it didn't have a bit of influence on me. I met the president of I. G. Farben. His wife entertained in his home, which is really unheard of because the home life of most any German is very private. We were put up in the casino in

Leverkusen, which was the place where they entertained their visitors. It was a very nice place. We had anything in the way of food that we could even think of.

Yet the people outside didn't have it, except that we did have the "eine topf essen." Once a week you had a bowl of heavy soup or what we would call beef stew. The difference between what it would cost to provide a regular meal and the "eine topf essen" was supposed to go to charity. They called it "Winterhilfe." That is what you saw from the inside.

Of course, we had got to know some of the working people. I'll always remember that they asked me if I would like to go down and have lunch with the working people. I told them that I would. So, we sat down on a bench at a long table and they brought out raw herring. They stripped the skin off of it and it just sat there with its head on and eyes looking up at you. We also got a big piece of bread and a stein of beer. That was our lunch. Well, I had never eaten raw fish before. It was a little rough to take. But this is an example, and why I was glad that I did it.

Dorothy got to know some of the people there a lot better than I did, particularly the wives. One was the wife of the head of this whole rubber works, Dr. Eric Konrad. His wife had been through the first world war. My wife spoke German very well. I could understand it and speak it a little bit in those days. This German woman was terrified that war was coming. Her family had been wiped out in the first world war. She had a boy and a girl, and she just couldn't face the fact that they were going to be cannon fodder. She often cried on Dorothy's shoulder about what was ahead of them. Konrad was director of research on synthetic rubber. The manager at Leverkusen was Kuhn, and I met him. Stagen was Associate Director.

Herr Doktor Eric Konrad was the fellow who startled us in the middle of the night. We were in bed when we heard this banging on the door, like he had taken a cane and banged on the door. I knew this fellow Konrad and had been working with him day after day. I got up and went to the door. "Heil, Hitler." He stood there just like a statue and clicked his heels. He said, "Winterhilfe." He never did recognize me. He put out his hand and he wanted money. He said that this would go to Hitler's "Winterhilfe" for the poor. He was dressed in a brown uniform with boots, and was absolutely transformed from the man I knew in the daytime in the laboratories.

FERGUSON: This was the man whose wife was complaining about the war?

HAYDEN: Yes. It was his wife who was so terribly concerned and talked to Dorothy about it. These other people are all people that I knew very well. Hoybaum, Koch, and Stricklin. They were

all nice chaps. I'm sure they were all Nazis except Koch. I'm sure he wasn't because he was terrified about what was going to happen. He confided a lot in me about it. I'll come back to him later on.

Another incident occurred when we were in Munich for a weekend. In the middle of the night we heard this crunch of soldiers steps, the clattering of hoofs, the rattling of harnesses and the turning of heavy wheels on cobblestone. We looked out the window. As far as we could see, there were troops and horse-drawn artillery. Nothing was motorized. It was the march on the Rhine. I immediately got dressed and went down to the desk to ask what was going on, but nobody knew. I went upstairs and told Dorothy to get dressed and pack up our bags; we were going to leave. We took the first train to Paris. I opened the newspaper there, and read that the Nazis had moved into the Rhine.

Later on, I had a friend over there that I had worked with at the Fisk Rubber Company. He was the plant manager for the Englebert Rubber Company in Aachen, Germany. We went over there to spend the weekend with him. One day I was in the plant with him. I was, of course, selling our products to the Englebert Rubber Company, because Englebert had always been a very good customer. After everyone had left, we were still there and this fellow Mel said to me, "Bill, I want to show you something." We walked out into the middle of the factory. He pulled up a trap door and we went down. It was stocked with food and water. He said, "In the whole Rhine valley, people could go underground and stay underground. It's simply a war preparation, the equivalent of a bomb shelter." So, Dorothy and I came home from Europe feeling certain that a war was going to break out.

FERGUSON: The U.S. public must have been aware that they were getting ready for war.

HAYDEN: They were aware of it, but I think only casually aware.

FERGUSON: I see. It must have hit you with considerable impact.

HAYDEN: Oh it did. We were just shaken up about it when we came back. It was just so obvious that war was about to come.

FERGUSON: Were there any other places on your itinerary?

HAYDEN: We went to Berchtesgaden, up in the German Alps.

FERGUSON: That's where Hitler had his fortified retreat.

HAYDEN: It was. Very interestingly while we were there we stayed in a place called the Kurhaus. It was be a very nice residential sanatorium, I guess you might call it. It had beautiful surroundings. The beautiful Alps were around there. He [Hitler] had his so-called Eagle's Nest there.

About a day or so after we got there, a courier came down and presented Herr Hitler's compliments. He [Hitler] regretted that he couldn't invite us up to the Eagle's Nest, but his schedule was such that he wasn't able to invite us during the short stay that we planned.

FERGUSON: So your visit was that important to him?

HAYDEN: Well, they wanted that Neoprene.

FERGUSON: There was some trouble later--antitrust investigations and congressional hearings. Did that pertain to your visit?

HAYDEN: I was never involved in that at all. I did see Hitler once though, while I was at Leverkusen. We did some of our work with Continental Gummifabrik at Hanover. I was in Hanover one time when it was said that there was going to be a big deal. Everybody had to assemble out in the main entry. There were five or six floors, but they all had balconies. Hitler came in and delivered a speech. I couldn't understand it because it was Deutch and he spoke rapidly. But I saw the man. I saw him go through the motions.

FERGUSON: Were you impressed?

HAYDEN: Not particularly. I just thought it was somebody ranting. I didn't know much about who Hitler was at that time. I just kept hearing "Heil, Hitler". Everybody was saying that.

FERGUSON: What was your feeling during this visit about the quality of I. G. Farben and the German industry in general?

HAYDEN: Well, it was tip top. I couldn't help but be impressed by them. The plant wasn't too different from the old Dye Works. It was just a hodgepodge of various operations. But still, I thought the people that I talked to were very high quality, competent, technical men.

FERGUSON: You commented in your report about the cleanliness of some of the compounding laboratories that you visited.

HAYDEN: Yes. Of course, I was always kind of a bear on that subject. I believe that you can't do good work in a sloppy place. I think the others felt I was a little rough in the way I used to think at the laboratory. I would complain if things weren't just spic and span. I felt that in order to do good work, you had to have a good place to work in and be careful and clean.

One of the things we did over there was to go to the German autobahn. We built tires and took them out on the autobahn. It was a day very much like this--rainy and cold. We ran those tires on the autobahn at a hundred kilometers per hour. I think we got up to about 120, which would be about 70 mph. Those tires got so hot that when you stopped, you could see the steam come right off of them. That heat build-up was one of the troubles with Neoprene.

FERGUSON: They gave you quite a bit of information on the various Buna rubbers?

HAYDEN: Yes. Buna S was butadiene-styrene. Buna N was butadiene-acrylonitrile. That was a very tough one and very oil resistant. Butadiene-styrene needed to have a lot of work done on processing, which was done when our government confiscated the patent, so to speak. We started making it during the war.

FERGUSON: There were some I. G. Farben patents on emulsion polymerization.

HAYDEN: I wasn't involved in that. I think the one to comment on that would have been Starkweather, and he's gone.

FERGUSON: Well, that brings us into some of your public involvement. Hayden and Bridgwater testified before the Baruch committee, in Washington, in August of 1942.

HAYDEN: Yes. That was on the need for synthetic rubber. You had to have a certificate of necessity to get the materials to build the plant. We saw a need and wanted to build a plant. Our plant was to be a ten-thousand ton production. We had a place in Louisville that had plenty of limestone and coal. We had an agreement with Louisville Gas and Electric for power. We could go ahead and produce the chloroprene.

FERGUSON: You made everything at Louisville, including acetylene?

HAYDEN: No, we made the HCl and we bought the acetylene from Union Carbide Company. Later we went up to Montague, Michigan. The edge of the city sat on a salt dome.

FERGUSON: That was for the HCl?

HAYDEN: Yes.

FERGUSON: Is that where they tried to run the arc acetylene process?

HAYDEN: Yes, and we bought our HCl.

[END OF TAPE, SIDE 4]

FERGUSON: Didn't the government take over the Neoprene plant at Louisville during the war?

HAYDEN: Yes.

FERGUSON: Did Du Pont operate it?

HAYDEN: Yes. They took over our plant and added three more production lines to it. In other words, it turned out forty thousand instead of ten.

FERGUSON: Were you involved at all in the government rubber project during the war?

HAYDEN: No.

FERGUSON: Did Du Pont purposely stay away from that?

HAYDEN: Well, I had nothing to do with it. Of course, we were involved with the Reconstruction Finance Corporation and the Rubber Commission. They worked very closely with the establishment in the plant--the money, the contracts and development, and relations between the government and ourselves. But, we were not involved in the rubber allocations and rubber

itself.

FERGUSON: In 1952 you served in the Office of Price Administration.

HAYDEN: Yes. Mike DeSalles was the head of Office of Price Administration (OPA). He had been the mayor of Toledo. The chemical manufacturing organizations had asked us to supply some men to go down there and head the various divisions for pricing chemicals. I was assigned to the pricing of aliphatic chemicals.

FERGUSON: Was that after John Kenneth Galbraith had left?

HAYDEN: Yes. The only one with any political importance that I had any contact with was Mike DeSalles.

FERGUSON: You've indicated that you did a lot of work with the ASTM. Was that an important contribution?

HAYDEN: I did a lot of work with them and I enjoyed it.

FERGUSON: You were a member of the American Chemical Society for fifty years. Were there any other professional organizations that you were particularly active in?

HAYDEN: No. I think the ASTM and the ACS were the only two that I was ever much interested in.

FERGUSON: For a large number of years you were involved in marketing and product quality. Is there anything that really stands out in your mind about this part of your career?

HAYDEN: I loved people. I loved to mingle with people and be with them. I think that one of the biggest contributions that I made with our particular organization was holding it all together through thick and thin. There were many times when some of the boys got terribly discouraged, or somebody got his nose out of joint. I enjoyed personnel matters very much. I think I did make a large contribution to our organization in making a team out of it. I made the thing gel, and kept the gears lubricated and meshed.

To carry that one step farther, I think that's what happened with my work at ASTM. As a matter of fact, I worked

closely with the ASE and the ASME. When I could get the two together I got them to work with each other instead of sitting across the table like two cats that are ready to spring at each other. I think we accomplished a great deal in that respect and made a lot of progress.

FERGUSON: Tell me about some of the people that you worked with. Wasn't J. Warren Kinsman one of them?

HAYDEN: He was the one who hired me.

FERGUSON: Yes. Did he have a technical background?

HAYDEN: He might have had some. He went to Wesleyan College in Middleton, Connecticut. I think he took liberal arts courses. He was a salesman through and through.

FERGUSON: Yes, but he ended up as plant manager and vice president?

HAYDEN: He was one of the vice presidents. I don't know much about his functions or accomplishments as a plant manager.

FERGUSON: He had a lot of visibility as a spokesman.

HAYDEN: Oh, yes. He was that. Well, you have to have a certain amount of egotism to go through things like that. He was a salesman; put it that way.

FERGUSON: Okay. When I knew him from a distance he struck me as a politician.

HAYDEN: That's right. He was all that. I liked Warren very much.

FERGUSON: Did you have close dealings with him?

HAYDEN: Well, I wouldn't say they were close. I felt close to him and we were always very friendly. My wife was friendly with him and his wife. We were good friends.

FERGUSON: What about Jack [John J.] Dailey?

HAYDEN: Oh, I worked for Jack. Jack was a straight shooter. I like Jack very much. He was like Buck Harrington, who was the first boss I had when I came here. He was a kind of grumpy and gruff sort of old fellow, but I liked him. He was a square shooter. That's the way it was with Jack. He could be tough at times. He was demanding as he should be as general manager.

FERGUSON: The other name that you mentioned was Buck Harrington?

HAYDEN: Yes. Willis F. Harrington. He was general manager of Orchem when I came to work there. Then he went upstairs and Ed Robinson took his place.

FERGUSON: I knew him.

HAYDEN: Then Jack Dailey came in.

FERGUSON: Dailey seemed like sort of a rough character to me.

HAYDEN: Well, Jack was a little rough but he was absolutely a square shooter. You always knew where you stood with Jack.

FERGUSON: What about Arnold M. Collins?

HAYDEN: Oh, Collins worked with Carothers. He was the guy who made the first chloroprene, left it in a test tube, and found that gum there in the morning.

FERGUSON: I believe he was from Columbia University.

HAYDEN: I'm not certain.

FERGUSON: Did you find him to be a particularly brilliant fellow?

HAYDEN: Well, I had no real way to evaluate him.

FERGUSON: He was very modest.

HAYDEN: He would strike you as being a very modest and unassertive person.

FERGUSON: You must have met Wallace Carothers at least once.

HAYDEN: Yes. I met him a number of times and I liked the man very much. In fact, I knew him socially when he lived with two or three other men in a little house. I forget whose house it was. We used to go out there in the wintertime and do a little skiing. Wallace Carothers was an awfully nice fellow, but the poor devil had awful migraine headaches. I think that's what happened to him. He just couldn't take it anymore. Also, there was some disagreement or disappointment with the way the research was going. He wanted to keep it pure research and there was a great demand from upstairs to forget your pride and get your experimental product into production.

FERGUSON: That leads to a question about Stine and Bolton. I've heard that when Bolton took over the Chemical Department from Stine, there was a definite change.

HAYDEN: Bolton was all for pushing research into dollar sales. Very much so, and that bothered Carothers a great deal.

FERGUSON: So you think that was what affected Carothers?

HAYDEN: Well, I think it was that, plus his migraine headaches.

FERGUSON: What about Father Julius Nieuwland? Did you know him?

HAYDEN: Well, I wouldn't say I knew him. I met him many times. He was an interesting character. He was a great botanist. He used to like to come down and spend weekends here. He was quite a pal of Calcott, who was the director of the Jackson Lab. The two of them would spend their weekends roaming around the pines of Jersey.

FERGUSON: I found Father Nieuwland listed in one of the Chemical Department organization charts. I don't remember in what year. Do you remember that he had been here?

HAYDEN: He used to come quite frequently as a consultant.

FERGUSON: He was actually listed on the staff, and not as a

consultant.

HAYDEN: I don't know about that.

FERGUSON: Maybe he spent a few months here.

HAYDEN: I don't ever remember his staying for any extensive periods. He may have, but all I know is that he was coming quite frequently and staying weekends. He was a very pleasant fellow. He had his old pipe. I always picture him with his pipe.

FERGUSON: You told John Smith that you made some Neoprene pen holders for the Pope and for Father Nieuwland, Bill Calcott, and yourself. Nieuwland was going over to visit the pope?

HAYDEN: That's right.

FERGUSON: Are these penholders still in existence?

HAYDEN: I think I sent mine over to Hagley. It was about so long and so thick. It was black, and the penholder was molded into it when it was made. You could stick a pen in it.

FERGUSON: You probably knew some Du Pont presidents and chief executives in some capacity.

HAYDEN: Well, the one that I knew at all was Lamont du Pont.

FERGUSON: Was he strongly supportive your work?

HAYDEN: Yes, he supported research and the kind of work that we were doing--the application work. I remember him sitting on the corner of my desk, quizzing me about Neoprene. This was in the early days. He said, "If we even have one shot in a thousand, I'm going to support it." If it looked like it had any chance at all, this was a start, and we could spend money to develop it. That was very encouraging.

FERGUSON: What about Walter Carpenter?

HAYDEN: He was a very personable man and made you feel entirely

at ease when he called you up to his office. You would just relax first and have your cigarette or cigar. I could talk to him just like I'm talking to you.

FERGUSON: He was apparently much involved at the start of the war with how much expansion you were going to have with Neoprene. I read that he even had some reservations. In fact, he was against it.

HAYDEN: Well, I didn't know that part of it. I really was more technically involved. He would ask me about the quality and prospects of putting it into the field, where it could be used, and subjects of that sort. Beyond that, I had no connection with him.

FERGUSON: There were no questions about investment policies?

HAYDEN: No. That would be Ed Robinson.

FERGUSON: You were probably involved in market estimates.

HAYDEN: Yes. I was involved in forecasting and estimates.

FERGUSON: Do you have any dealings with Crawford Greenewalt?

HAYDEN: Very few. Just casual.

FERGUSON: And Pierre du Pont and Irénée du Pont?

HAYDEN: I didn't know those men at all. They were just names. I saw them and knew who they were, but I never had any close relationship with Pierre and Irénée.

FERGUSON: You mentioned Clifford Sanderson earlier.

HAYDEN: Cliff Sanderson was one of the three of us at Fisk. He was the senior of the three of us. When Fisk was taken over by U.S. Rubber, Cliff left and went with Goodyear. The other fellow, Joe Partenhiemer, went with Standard Oil of New Jersey and headed up the Atlas group--Atlas tires and automobile accessories. He was with them until he retired. He's still living.

FERGUSON: You had a clipping from the Worcester Polytech Bulletin about Sanderson.

HAYDEN: Oh yes. Cliff was a very close friend of mine.

FERGUSON: Did your association continued through the rubber division or just personally?

HAYDEN: Cliff was the senior of we three kids at Fisk. I always kept in contact with him socially.

FERGUSON: What about Herbert Walker?

HAYDEN: Herb was one of the boys at Jackson Lab. Did you know him?

FERGUSON: Oh, yes. In fact he was finishing his report on the chemistry and technology of Neoprene when I arrived. One of the first things they did to all of the new people coming in was to say, "Go in and talk to Herb Walker and find out from him what you ought to know." [laughter] He was a very capable man.

HAYDEN: He was a pretty good fellow.

FERGUSON: You had mentioned Dr. Ira Williams.

HAYDEN: Ira was a real original thinker and doer. He had the most fertile mind. As an example, he went over to Woodstown and bought himself a house. He liked boxwood, so he had a row of boxwood on either side of the sidewalk going into his house. The dogs coming down the street would turn up on the boxwoods down at the end, and it would burn them. I used to go over and see Ira quite often. One time those boxwoods looked pretty good. I said, "What did you do with this?" He said, "Well, I know how to fix those dogs and save my boxwood. I got myself a little dachshund and I got a muzzle. I soldered a darning needle in the end of that muzzle. The dogs would come down the street. When he would come out to greet them the dogs would take off." [laughter] He had no more trouble. He made most of his own equipment.

FERGUSON: What happened to him?

HAYDEN: He left and went with J. M. Huber, the colors and carbon black people. He went down to Borger, Texas and headed up their research. He died there a few years later.

FERGUSON: Ernest Bridgwater was your boss. What was his background?

HAYDEN: He went to MIT, but he didn't graduate. I think he left during the war. [B.S., MIT, 1918; ed.] As I remember, he went to work in the Bureau of Standards with Lewis. They worked on gas. Then he went with Goodrich. I have a hunch that [James W.] Kinsman hired him from Goodrich.

FERGUSON: Vic [Victor A.] Cosler?

HAYDEN: Oh, Vic was a character. He was a very competent man. He had been at Goodrich for years, and then he went to the Hewett Rubber Company as a technical superintendent of their plant for mechanical rubber goods. He was brought into our group to head up what we called indirect selling. He would go out and show a prospective customer how, by using our product, he could substitute it for something else. Or he would show how to make a new product that was far better than anything in the field. That was Cos's forte. He was very good at that. He was an exceptionally good man. I think he had retired before he died of a heart attack.

FERGUSON: Bert Latimore?

HAYDEN: Bert was a very good publicity man. He still does some publicity work. He's retired and lives in Port St. Lucie in Florida.

FERGUSON: In your talk in Montreal you mentioned Mel Lerner of Rubber Age.

HAYDEN: He was a good friend of ours. He was always receptive to anything that was new and he gave us a lot of publicity about Neoprene.

FERGUSON: Was he a technical man?

HAYDEN: Yes. He was really the editor of the Rubber Age. I think he had some technology background.

FERGUSON: You also mentioned Pete Pinto of Rubber World.

HAYDEN: I can say the same about Pete that I did about Lerner.

FERGUSON: What about Howard Starkweather, Sr.?

HAYDEN: Well, Howard Starkweather, Sr., was a very fine man. He was a Quaker. True to the Quaker tradition, he was a very plain sort of person, but honest as the day was long. Nothing was stronger than his word. He was a very high-principled person. He was very strict in his morals. He didn't drink or smoke, but still, he was liked by everybody and a very competent man. He got his Ph.D. at Harvard.

FERGUSON: I suppose you knew Sam Lehner.

HAYDEN: Oh, I knew Sam when he was in "short pants." That's not really true, but I knew him when he first came to work. He worked in Tech Lab, in the dye end of it.

FERGUSON: Harold Elley was research director when I came.

HAYDEN: Harold was one of my very closest friends, so I might be biased. I liked Harold. He was a very fine man, very much of a gentleman and very competent.

FERGUSON: Yes. He was also a musician.

HAYDEN: Oh, yes. He was a beautiful pianist and a very good organist. His recreation used to be going to Will Raskob's place. Raskob had a pipe organ in his music conservatory. Harold used to go there on Saturdays and play that organ. That was his recreation.

FERGUSON: You mentioned Edmund G. Robinson earlier.

HAYDEN: He was our general manager. He was a Swarthmore graduate and had been at the Experimental Station in the early days.

FERGUSON: Frederick B. Downing.

HAYDEN: Fred had a lot to do with Neoprene in the early days.

FERGUSON: I associated him more with tetraethyllead.

HAYDEN: From there he came over and was group leader in the work on Neoprene done in Jackson Laboratory. We called him Fritz.

FERGUSON: Yes. He preferred that. John Tinker? He was in one of your pictures. Was he in dye chemistry?

HAYDEN: John came from Newport, so he must have been.

FERGUSON: Nick [Albert S.] Carter?

HAYDEN: Nick was at Jackson Lab. I always thought of him as being an acetylene chemist.

FERGUSON: Was he responsible for the monovinylacetylene plant at Chambers Works?

HAYDEN: I don't know if he was responsible for it, but he was very much tied up with it. I think Freddy Mitchell probably had more to do with the design of it.

FERGUSON: At Carter's retirement party they were ribbing him, and one of the things they showed, as his accomplishment, was a picture of a building on fire. All the older people laughed, but I didn't understand what it was about.

HAYDEN: He was involved, of course. That was monovinylacetylene that got loose and caught fire. I always think of Herb Walker. He had monovinylacetylene and put it aside. The next morning he came in and stuck a pencil in the test-tube. Bang, it went off. It burned his face, burned his eyebrows and hair off.

FERGUSON: I can remember a story about somebody at Jackson Lab who had a little ball of polydivinylacetylene that pyrolyzed spontaneously on his desk one day.

HAYDEN: Yes. The gel would. Divinylacetylene would very rapidly form a peroxide, and that peroxide was a gel. If you disturbed it as it went through that stage you were in trouble.

That was in the test tube that Herb happened to just touch with a pencil. When it was fully polymerized it was as inert as silica. We thought we were going to be able to coat chemical drums, because it was absolutely inert. In one of the experiments they painted this a on Rubber Laboratory table. Later, when someone dropped a tool on the table, a sheet of flame propagated clear down the surface.

[END OF TAPE, SIDE 5]

FERGUSON: H. H. Abernathy is in one of the pictures that you gave me.

HAYDEN: Herman Abernathy was a bright young man. I believe he was a graduate of Emory. He had an M.S. degree and he was very competent. He was an aggressive young man and a pretty good chemist. He started out in Jackson Laboratory as a cub chemist and got into the polymer work and Neoprene latex. He was taken over into our group in the commercialization of latex. He worked with Dr. Benton Dales, who was a kind of a godfather to all the latex work in our division. Herman is still living and is retired. In fact, I'm going to have lunch with him tomorrow. He is a very capable man. I think he did a very good job for the company. After I retired, he got more into the commercial side of it. He had a lot to do with a Japanese contract and spent quite a bit of time in Japan. He was just a very smart young man.

FERGUSON: Now, we're into retirement and politics. What is this Franklin D. Roosevelt plaque that you are holding in this photograph? [Photograph taken at O. M. Hayden's retirement party, August 1958. He holds poster titled "My friends. F.D.R."]

HAYDEN: Well, F.D.R. wasn't held in my highest respect.

FERGUSON: I see.

HAYDEN: This is made of Roosevelt dimes. I used to say, "Oh, I've got a Roosevelt dime. I'll just throw it away. I won't carry it in my pocket." So, they began putting me on, and made up this FDR thing out of Roosevelt dimes.

FERGUSON: Do you have any kinder feelings now about Roosevelt?

HAYDEN: Most of that was put on. You know, you get into a thing and you have to keep it up. Of course, I was very much annoyed with the way he treated Mr. Hoover. I could never quite forgive him for that.

FERGUSON: This is a picture of somebody with you in your office.

HAYDEN: That is Pete Murawski. He was our salesman in New York. He was the salesman that called on the electrical trade, and particularly had a great deal to do with the establishment of Neoprene as a coating for secondary wire distribution of electricity.

FERGUSON: Here's one of--

HAYDEN: That's Archie Meese, who is the manager of our West Coast sales. Next to him is Stan Ford, who was the production manager for the Organic Chemicals. That's me, and then John Tinker.

FERGUSON: Yes. Here are two more.

HAYDEN: That's Bill Askew. He started at Jackson Laboratory and got into rubber latex work. He did quite well there working with old Dr. Ben Dales and Herman. But, Bill was a salesman. He got into sales and did an excellent job. The other fellow is Vic Cosler, who was in indirect selling.

FERGUSON: When you retired you got involved with volunteer work.

HAYDEN: That was with John Jessup and a group of retirees. He formed a Delaware Citizens Crime Committee. Our objective was to visit the courts. This was authorized by the Supreme Court of Delaware. From a layman's point of view, we visited the courts, and we reported back on how we felt the courts were being operated. The two accomplishments that I think we were responsible for were the change in the magistrate system and a change in the bail system.

We found some people denied bail that had been put out in the workhouse and forgotten. They had been there perhaps a year or more before they were brought to trial. A rotating fund was established that provided bail so that these people, depending on what they were there for, could be put out on bail. If a man couldn't meet bail, he was put out there in the slammer, as they would say. Some fellows were left there for months and forgotten. I think with those two things we accomplished a great deal. There were other things we accomplished that I don't want to talk about. We did a lot of good work.

FERGUSON: You were active in the Masons?

HAYDEN: Oh, yes. I was very inactive for many years and after I retired, I thought I had better take advantage of it. The Masons meant a great deal to me during the first World War. It really did. Then I became too busy with many other things. For years, I didn't go into the lodge at all. Then I became a Shriner and became interested in that work. I never had an office in it. I always enjoyed nice things about the Masons, and the friendships I developed through it. I was never what you would call a good Mason, going to the lodge day after day.

Every Monday I go down to Hearns Restaurant with a group of old has-been Shriners. On Fridays, I used to go down to the Masonic Temple. They have a very nice luncheon there with very good speakers. Today I can go down on the bus, but I can't walk from the bus terminal. It ends at 9th and Shipley and I can't walk from there all the way over to 8th and Market. It's just too much for me. So I don't go.

After the stroke, I put my car away into storage. I hope I'll get it out in the spring and maybe in the summer, I'll be able to drive it again. But, I don't feel capable of driving right now because I don't have coordination between my mind and my feet and my mind and my hands. If I hit an emergency, I probably wouldn't be able to hit the brake.

FERGUSON: Don't they provide a bus service from Foulk Manor North?

HAYDEN: Yes. They go downtown once a week, to Fairfax and other places.

FERGUSON: I would like your comments on the state of polymer technology. There were some very radical changes during your time.

HAYDEN: Yes. As a matter of fact, I can't even understand some of the language.

FERGUSON: I have the same problem. [laughter]

HAYDEN: The organic chemistry that I had was very primitive compared to what we have today. I don't know that I could follow a modern first year organic chemistry course. I'm sure a lot of it is way beyond what I ever had in college.

FERGUSON: Today, a lot of introductory chemistry starts with quantum theory.

HAYDEN: I expect it does. That was something I heard about. Very little was done with it.

FERGUSON: You were really out in the trade and business more than the research end.

HAYDEN: Yes. Overall, the field of technology made two tremendous strides. I hate to say it, but war brought the strides on. I think of the great strides in serology and in medicine in the first World War. Also, the sulfa drugs came in. Then, the second World War brought electronics and the computer. In both cases it was due to the effort and the focusing of brains on projects that affected war. But, they were translated into business and everyday use. Whoever would have thought there would be a computer on everybody's desk?

FERGUSON: Certainly, World War II gave Du Pont a big boost with nylon and Neoprene.

HAYDEN: Absolutely. You know, when I think about my own life, I've seen the automobile come. I remember that they let the whole school out to see an automobile go by. I've seen the trolley car come and go. I've seen the automobile start off as a crude sort of thing. As a matter of fact, when I was a boy there was a chap in our town who was sort of an inventor. He had an upright steam boiler on an old farm wagon. He stoked it with charcoal soaked in kerosene. He had to stop at a watering trough to get water in it, but it would chug along in a parade or something of that sort.

There are so many things that I've seen come and go. I've seen the telephone come. The telegraph was there when I was younger. I can remember very clearly when the new century came in. Although we lived about three miles from town, I could hear the church bells ringing at midnight. One factory tied the whistle down and let it blow. I remember Halley's comet and how beautiful it was going completely over the whole horizon. There are so many things in my lifetime that have come and gone, or have been replaced, usually for the better.

FERGUSON: Here is another picture with some new people in it.

HAYDEN: The fellow standing there is Vic Cosler. He was a great guy. This is Seward Byam, who was the sales manager of Neoprene in the early days. This is Cabby Bartle, who was a

real salesman and the sales manager of rubber chemicals. This is Ernest Bridgwater.

FERGUSON: When was this picture taken?

HAYDEN: This was probably the twenty-fifth anniversary of Neoprene, so it would have been 1957. It was somewhere around that time. It was done as a publicity effort. These were the five fellows who put Neoprene across and commercialized it.

FERGUSON: Can you tell me anything else about the Du Pont company in the early days?

HAYDEN: I came in the days before pensions. I have just a couple of incidents that I know of. We had a fellow by the name of Johnny Craig, who had been an old powder monkey. He was working with the construction gang over at the Chambers Works. When they wanted a screwdriver or some tool, they asked Johnny to go and get it. This was in the bottom of the Depression. I saw Johnny on the ferry going back home that night and he was kind of down at the mouth. In those days the place was so small that you really knew everybody in the plant by their first name. So I asked him what was the matter. He said, "You know, Mr. Hayden, I got laid off." I said, "You did?" He said, "Yes, I got laid off and I feel pretty bad about it. I've been with the company for a good many years."

The next morning he was back on the ferry and he was smiling. I asked him what happened? He said, "Well, I'll tell you. I went home and while my wife and I were having supper I told her I got laid off and how badly I felt about it. She said, `Why don't you go and see Perry [Pierre S. du Pont]?' I thought about it and I got my son, who had an automobile, to drive me over to Longwood. I went up to the front door and rapped on it. A man came to the door and I asked if Mr. Perry was at home. A voice came back and said, `Come on Johnny, what are you doing? What do you want?'" He said that Mr. Perry brought him in and asked, "What's the matter, Johnny?" He said, "Mr. Perry, I got laid off today." He said, "Johnny, you go back to work tomorrow morning, take your old job up, and if anybody says anything you call me."

FERGUSON: He called him "Perry"?

HAYDEN: Yes. I said, "Well, how did you know him?" And he said, "Me and Perry always played together in the Hagley yard when we were kids." I really cite that as the way they looked after their people. They knew their people and their families. We were pretty much expected to know our people and their

families, and if they were in need, to do something about it. We had one man at the dye works whose principal job was to take care of such needs. That's just an example.

I remember another example. I had two old fellows who had been powder monkeys working for me. They were given to me to give them a job. One day, a young chemist came in and said, "Bill, old Horace isn't holding up. He isn't holding his load and isn't doing the work. I have him running the storeroom, but he falls asleep." So I said, "You come on in. I want to talk to you." I said, "You know, there's no pension system here. Someday, you may be old and not well enough to hold your own job. You'll be damn thankful that you have a job where you can come in and just punch the clock and do some work. Maybe you will happen to be like old people who fall asleep--they call it narcolepsy. Old Horace is going to have a job as long as he can come in and push the clock."

FERGUSON: It's a bit different now.

HAYDEN: Yes. I know it's quite different. But, there was a certain amount of compassion. You were responsible for the people that you worked with or that worked for you. That wasn't unique in my organization. It was the same throughout the company. I'm sure there was a lot of deadwood. Of course, the company was making money and it was easier.

There were an untold number of young men who were put through college and given an education. That was never known to the public. There were an untold number of individuals. You've heard of old "Doc" Humphrey over at the Chambers Works? Do you know him?

FERGUSON: The name sounds familiar.

HAYDEN: E. C. Humphrey was basic colors superintendent. He was a pretty rough character in lots of ways. But many is the boy that he put through college on his own. There was a lot of that being done.

FERGUSON: I have an employee handbook dated June 1957 that states that Du Pont had a retirement and pension plan in 1904.

HAYDEN: I don't know when it started. As I recall, it wasn't there when I began working at Du Pont. It may have been limited. I don't think it covered wage roll people.

FERGUSON: John Smith taped his interviews with you for his

report on the history of Neoprene (5)?

HAYDEN: You have his report?

FERGUSON: Yes. In fact, would you like to have a copy of it?

HAYDEN: He gave me a copy.

FERGUSON: He never had your tapes transcribed. If he's willing, would you like to have us transcribe those tapes and include them as part of this interview?

HAYDEN: Go ahead, if you'd like. I'm not using them. I signed that all over to Hagley.

FERGUSON: You've had an outstanding career and it is certainly an interesting story that you've told me today.

HAYDEN: Well, I've had a lot of fun.

NOTES

1. I. Remsen, Organic Chemistry , revised edition by W. R. Orndorff (New York and London, Macmillan, 1923).

2. L. E. Weber, The Chemistry of Rubber Manufacture (London, Griffin & Co., 1926).

3. William S. Calcott, William A. Douglas and Oliver M. Hayden, "Retarding Deterioration of Rubber," U.S. Patent 1,725,564, issued 20 August 1929. idem., "Rubber Composition," U.S. Patent 1,899,554, issued 28 February 1933.

4. O. M. Hayden, "Report of European Trip, 3 January-14 March, 1936." BCHOC Archives, collection 86:5.

5. Taped interview of O.M. Hayden by John K. Smith, Eleutheran Mills-Hagley Museum, 1980

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