

CHEMICAL HERITAGE FOUNDATION

GORDON A. CAIN

Transcript of an Interview  
Conducted by

James J. Bohning

in

Houston, Texas

on

18 February 1992

(With Subsequent Additions and Corrections)

THE BECKMAN CENTER FOR THE HISTORY OF CHEMISTRY  
Oral History Program

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Gordon A. Cain

Gordon A. Cain

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GORDON A. CAIN

1912 Born in Baton Rouge, Louisiana on May 31

Education

1933 B.S., chemical engineering, Louisiana State University

Professional Experience

1933-1935 Test engineer, Louisiana Power and Light Company  
1935-1941 Chemical engineer, Freeport Sulphur Company  
1941-1942 Senior design engineer, Merck & Co., Inc.  
1942-1946 Captain, United States Army  
1946-1949 Chemical engineer, Freeport Sulphur Company  
1949-1950 Vice president, Standard Perlite Company  
1950-1951 Consultant  
1951-1955 Assistant to the president, Westvaco Mineral Products Division  
1955-1964 Vice president, Petro-Tex Chemical Corporation  
1964-1970 General manager, Petrochemical Department, Continental Oil Company  
1970-1976 Director, PASA Petroquimica Argentina  
Chairman, Atec, Inc.  
Chairman, Computer Application Technology  
Chairman, Iotron Group  
1976-1980 Chairman, Petro-Tex Chemical Corporation  
1980-1982 President, Alaska Interstate  
1982-1986 Chairman, Vista Chemical Company  
1982-1987 Chairman of the Board, The Sterling Group  
1986-1987 Chairman of the Board, Sterling Chemicals  
1987-1988 Chairman, Cain Chemical, Inc.  
1991-1993 Chairman of the Board, Atlantic Coast Airlines, Inc.

Honors

1988 Winthrop-Sears Medal, Chemical Industry Association  
1990 John Frtiz Medal, United Engineering Trustees, Inc.

## ABSTRACT

Gordon A. Cain begins the interview by discussing his early influences from the chemical and engineering disciplines. He next recounts his undergraduate education at Louisiana State University during the Great Depression. He describes his first jobs in the chemical industry and his first patents. He enlisted during World War II as a captain and served in the Pacific with an Army heavy mortar company. After the war he worked in scientific intelligence in Germany. Returning to the United States, Cain shifted the direction of his career away from chemical engineering and into management, consulting and ownership of various chemical and high technology concerns. Cain then discusses his experiences as head of Vista, Cain Chemical and the Sterling Group and the impact of venture capital and leveraged buyouts on his career and on the chemical industry. He describes his philosophy and standards for running these large companies, including employee ownership and the Deming system. Cain concludes the interview with a discussion of his family and hobbies and an analysis of the changing business climate.

## INTERVIEWER

James J. Bohning, Assistant Director at the Chemical Heritage Foundation, holds the B.S., M.S., and Ph.D. degrees in chemistry. He was a member of the chemistry faculty at Wilkes University from 1959 until 1990, where he served as chair of the Chemistry Department for sixteen years, and chair of the Earth and Environmental Sciences Department for three years. He was Chair of the Division of the History of Chemistry of the American Chemical Society in 1986, and has been associated with the development and management of the Foundation's oral history program since 1985.

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INTERVIEWER: James J. Bohning  
LOCATION: Houston, Texas  
DATE: 18 February 1992

BOHNING: I know that you were born on May 31st, 1912 in Baton Rouge. Could you tell me something about your parents and your family background?

CAIN: Yes. My parents were both from Louisiana. My father attended Louisiana State University. He intended to become a doctor, but the boll weevil, an insect that destroyed the cotton crop back in the early 1900s, broke his father who had three children in the university at one time. My father, instead of going to medical school, got a degree in chemistry.

He taught chemistry in high school for one year and then became a chemist for the state department of agriculture. This was largely analytical work on fertilizer and things like that. After four or five years he decided it was too confining and became director of a state experimental farm. Later he became what is called a County Agricultural Agent, which involved teaching farmers to farm.

My mother also graduated from Louisiana State University. Of course, there was never any question about where I would go to school. I was obviously going to go to LSU. The question was what would I study. I made this decision in the middle of the Depression. I graduated from high school in 1928, and, although officially people think about the crash starting in 1929, actually, in the cotton growing country it started several years before that. I decided early in the game that I wanted to study some form of science or engineering. I was good in math, and I liked the limited amount of science I had in high school. I found something that said that chemical engineers earned more money getting out of school than any other branch of engineering or science. That's how I became a chemical engineer instead of an electrical engineer or a physicist or something else. At that point I'd never seen a chemical engineer in my life, and I didn't really know what one did.

BOHNING: What was your father's name?

CAIN: His name was Gordon also, but we have different middle initials. His was Gordon D. Cain, and mine's Gordon A.

BOHNING: Did he have any influence in your decision to pursue chemistry since he himself was a chemist?

CAIN: Possibly. I'm sure the fact that he was a chemist was an influence on me. As I said, I had never seen a chemical engineer up to that point. The closest I'd come was a man in my home town, it was a small cotton farming town, who was what was then called a sugar engineer. He worked in the sugar mills in Louisiana from September to December or January, then went to Latin America and worked until June or July, and then came home and had a two or three month vacation. I thought at the time that that was a great way to work. That was the closest to chemical engineering I came.

For a long time, the Audubon Sugar School at LSU provided a high percentage of all of the technologists for the sugar industry all over the world. A few years before I went to college, the Audubon Sugar School was converted to the department of chemical engineering at LSU.

BOHNING: What year did you start at LSU?

CAIN: I started in 1929. I worked a year between high school and college as a clerk on the Missouri-Pacific Railroad. I was just sixteen when I graduated, so I worked for a year and got money to go to college.

BOHNING: Where did you grow up? In Baton Rouge? You said a small town.

CAIN: No, I grew up in two small towns in Louisiana. One was Calhoun, where the experimental farm was located, in north Louisiana. The rest of the time was in Rayville, which is in the northeast corner of Louisiana in the flat, rich Mississippi Delta land, largely a cotton farming area.

BOHNING: What was it like growing up there as a child?

CAIN: I doubt if it was much different from growing up anywhere else at that particular time. Of course, I don't remember thinking about any of the problems that are current today.

Drugs were just a word. There was an occasional town drunk, but alcohol wasn't a significant problem. Crime was so rare that you talked about it for days and days afterward. I grew up pretty much the same way any small town person did in the 1920s.

BOHNING: It strikes me as being somewhat unusual for the period that both your parents were college graduates.

CAIN: Yes, it was. My grandparents were not college graduates, but they were both very well-read people. They knew Latin and Greek, as did my father, and he learned at home, not at college. There was a time in that part of the world when men of their background knew Latin and Greek. I think they learned from tutors. I remember that my father's father was a very well-read man, but he never had any higher learning.

BOHNING: Had his family been in Louisiana a long time?

CAIN: Yes. My ancestry is almost entirely Scotch-English and what is sometimes called Scotch-Irish. That is, Scots who went to Ireland and stayed a few generations and then immigrated to this country. The area where they lived is what is now the north of Ireland. For the most part they immigrated to this country in the 1700s, settled in the Carolinas and then slowly worked their way west and southwest.

BOHNING: As you said, the Depression had started earlier in the cotton country, so it happened before you started college.

CAIN: That's right. I was there during the Depression. It cost me a maximum of five hundred dollars a year, total expenses, to go to school. I made part of that in the summertime and part of it working, part of it my family gave me and part of it I borrowed. I was a typical Depression student.

BOHNING: I imagine there must have been a number of people who couldn't finish going to college at that time.

CAIN: There were, and there were a number of them who would drop out for a semester and come back. Very few of the men I graduated with, probably less than half of them, had gone through four straight years as I did. Many of them had started two or three years before and dropped out for a semester to work. Included in them were a number of people who had

graduated as chemists earlier and came back to take chemical engineering. Many of these were these sugar people who'd gone out as sugar chemists. The sugar industry went to hell about that time, so at least a third of my classmates were people who had worked in sugar and had come back to take chemical engineering.

BOHNING: What was your reaction when you got there? You said you had never seen a chemical engineer, yet there you were in a chemical engineering curriculum.

CAIN: [laughs] I know. Well, the first thing I saw was a demonstration sugar mill on the campus. Since it was the fall, it was operating. This was my first sight of any sort of chemical process--the grinding of sugar cane and the conversion to sugar. During my first year, I went out to a real sugar mill. I couldn't understand the place of a chemical engineer in the thing because it was about as unscientific an operation as you can imagine. There was an old Cajun with a kerosene lantern and a glass slide, and he would pull samples out of the evaporator to see if the crystals were forming properly. He and his lantern were the sole control. If you ran the evaporator improperly you could make the sugar into syrup and get no crystals at all. He, with his kerosene lantern and his glass slides, controlled what sort of sugar this mill made. [laughter]

BOHNING: That's interesting. There are a couple things I want to ask you about the LSU department. Was chemical engineering a separate department from chemistry?

CAIN: Yes. It was a separate department. At that point, it was half in the engineering school and half in the school of applied science. It was a hybrid operation. The chemistry faculty had more influence in the chemical engineering school than the engineering faculty, largely because of Dean [Charles E.] Coates, who had been dean of the sugar school for thirty or forty years and pretty much dominated the chemical engineering department.

BOHNING: In 1929 chemical engineering was still a young discipline. It had only been a real, separate discipline for maybe ten or twenty years.

CAIN: Yes, I know. Of course, we started out with the Walker, Lewis and McAdams text (1) that I think every chemical engineer, at least at that point, started with.

BOHNING: What was your curriculum like at the beginning?

CAIN: As I remember, all the engineers took the same thing for the first year. There were minor variations the second year. In comparison with the current chemical engineering curriculum, ours was much more heavily chemical. I took quantitative and qualitative analysis, which I don't think chemical engineers take anymore. I took two years of organic chemistry.

BOHNING: Wow!

CAIN: And I took a year of physical chemistry. I think I even took a second year of physical chemistry. Even at the time, it was more heavily chemical than average, and certainly much more heavily chemically oriented than the current curriculum. I graduated in 1933 right after the bank holiday. All the banks were closed for anywhere from a week to two or three months, and some of them forever. I lived my last few months in college on cafeteria meal checks. Nobody had any money. The university let us sign for meal tickets in the cafeteria, and these became the medium of exchange for the campus and even the businesses around the campus. Everybody finished credit using these cafeteria meal checks to live on.

BOHNING: Can you tell me something about some of the faculty there?

CAIN: Yes. The dominant member of the faculty was Professor Charles Coates, who at that time was probably past retirement age. I would guess that when I graduated he must have been seventy-three or seventy-four. Maybe even a little older. He had run this Audubon Sugar School for a long, long time, and was a recognized figure in the sugar chemistry business. As for the rest of the chemical faculty, I remember Dr. [R. L.] Menville, who was an inorganic chemistry professor. Arthur Chopin was a physical chemistry teacher. There was only one chemical engineering professor, Paul Horton. He didn't have any assistant professors. He had graduate assistants who could grade papers, but that was it. He was very aloof with his students, but after I graduated I became very fond of him. I think he felt some need to maintain distance with his students, but once you graduated you were in a different category.

In my graduating class there were only thirteen chemical engineers. This was the Depression, and not a single corporate recruiter showed up on the campus that year for any of the engineering schools. None of my classmates had professional

jobs. Some of the petroleum engineers got labor jobs in the oil fields. Some of the chemical engineers got jobs as sample boys in the refineries where they rode around on a bicycle and collected samples from tanks.

I didn't have a job when I graduated. I had a fellowship to go back to school, but I didn't particularly want to go. The idea of going to graduate school was attractive, and I think I would have liked it and been very happy at it, but I had been going to school and working part-time and borrowing money. I was in debt. I had two brothers in the university at that time, and I couldn't take any more money from my parents with them having two more in college. I had a great desire to go to work, but I couldn't find a job. A week before I was to go back to the university to take my graduate fellowship, I heard of a man who had graduated a few years before I did and whom I knew just slightly. He had a job and wanted to go to graduate school. I went to see him at his job, and we went to see his boss and got the dean of the college on the telephone, and we made a trade. We traded my fellowship for his job. [laughter] He wouldn't give up the job until he was sure he could get the fellowship, and I wouldn't give up the fellowship until I was sure I could get the job. It was a lousy job, but it paid reasonably well for that time. It was working in a big central steam generating station, a power station.

BOHNING: That's Louisiana Power and Light Company.

CAIN: Right. I was a combination boiler feed-water, chemist, instrument mechanic, and efficiency calculator. It said I was an engineer, but I spent more time in work clothes than I did in white shirts. It was the kind of job in which you wouldn't want to stay any longer than necessary. It took me two years to find another job, which was with the Freeport Sulphur Company.

BOHNING: In your LSU training, what kind of laboratory facilities did they have? Did you have much practical experience that you could use later?

CAIN: Probably more than average because of the sugar mill, which was much more than a pilot plant. It had all full-scale equipment. The agricultural experimental station there was raising enough sugar cane to run the mill, so we ran this sugar mill every fall for two or three months. That was the only practical experience we had. The students ran it completely, so we got real hands-on experience.

Baton Rouge, for its time, had more chemical industry around it than many places. There was a big Standard Oil of Louisiana, now Exxon, refinery there and a number of satellite sulfuric acid plants and things like that around it. There was more opportunity for field trips than many places.

BOHNING: Did you feel comfortable in your selection of chemical engineering as you went through LSU?

CAIN: Yes, I did. I was happy with the selection.

BOHNING: You said you spent those two years at the power company sort of biding your time because you had an income. How did you make your connection with Freeport Sulphur?

CAIN: One of my classmates went to work there. He got a job a few months after I did. He called me and told me that if I showed up he was sure that they would hire me, and I did and they did. I drove down to Freeport, Texas, and went to work for the Freeport Sulphur Company.

This turned out to be a very good experience. It was a good company and its people were honorable and good people. There were a number of things going on. I spent six very pleasant and worthwhile years at Freeport from 1935 to 1941. At first I was involved in operations. We started something that would be mandatory now, which is the re-use of the bleed water that came from the formation. After you put hot water down to melt the sulfur, the water has to go somewhere, and at that point it was going out into the local prairie. Not because of any environmental reasons but to re-use the heat, we developed techniques for re-using the water.

Freeport was involved in a manganese operation in Cuba, and I went down to Cuba and spent nearly a year working on a flotation process to beneficiate manganese. Between my junior and senior years I had been to a ROTC camp up in Edgewood Arsenal, Maryland. This was the first time I'd been more than a hundred miles away from the lower Mississippi River. The idea of going to a place like Cuba for a year was fascinating. I had a great time there, working on developing this flotation process to recover manganese.

BOHNING: What was it like in Cuba at that time?

CAIN: This was in 1938. Cuba was a very pleasant place. We were about fifteen or twenty miles north of Santiago. We were a group of maybe ten Americans, and there were probably not more than twenty Americans in the whole section around there. I joined a golf club, and I joined the beach club in Santiago. I had a great time there. The Cubans were very friendly, and I had the unusual experience for a young man of that time of having dates with a dueña along, where an old aunt or somebody came along whenever you took a girl anywhere. [laughter]

BOHNING: Were you paid American wages?

CAIN: Yes. Financially I did quite well. We lived in a mining camp, and it didn't cost us much to live. When I came back I went prospecting for molybdenum in Nevada in the north end of Death Valley. That was interesting, too, because our headquarters was the town of Goldfield, which had several distinctions. In the early 1900s it had thirty thousand people and street cars and stock exchanges. At this point it had a population of sixty. It has a black mark in labor history because it was one of the places where President Roosevelt used federal troops to break a strike. The strike was over a very interesting issue that doesn't come up anymore. That was whether the miners had to change clothes after they came off shift or not, because the custom was to fill their boots with high grade gold dust and carry it out. They tried to impose a clothes changing policy, and that caused a strike. It was an interesting place to live and an interesting experience.

[END OF TAPE, SIDE 1]

BOHNING: Freeport Sulphur was involved in more than just sulfur?

CAIN: Yes. They had aspirations to be a mining company, and they were in the manganese mining business in Cuba. They wanted to develop other mining operations, but the manganese was the only one that was successful. We were taking samples on a big molybdenum prospect in the north end of Death Valley in a place called Alum Gulch. There was a big exposed cliff about a thousand feet high and maybe a mile or two across, and it was almost pure molybdenite on the surface. We thought there must be tremendous amounts behind that, but we took samples from the top and drove tunnels in the side. Obviously what had happened was that all the molybdenum that had ever been there had leached out and deposited on the surface. It had a tremendous deposit, a thousand feet by a couple of miles and an eighth of an inch

thick. The prospects were so intriguing that we spent a lot of money and time on it. For me it was a great experience and a great time.

BOHNING: Who were some of the people you were working with at that time?

CAIN: Most of them have gone on to other things. One was a geologist named Ralph Taylor who subsequently worked and I think eventually retired as the geologist with Exxon in charge of their non-oil geological things. Exxon went through a phase of wanting to get into mining.

BOHNING: There was a mixture of backgrounds.

CAIN: Yes. The others were mining engineers, and I was the chemist and did all the sampling and that kind of thing.

BOHNING: When did you come back from Nevada?

CAIN: My recollection is that I spent 1938 in Cuba, 1940 in Nevada, and I came back from Nevada in late 1940. I attended an AIChE [American Institute of Chemical Engineers] meeting in New Orleans probably in January of 1941, and at a luncheon I sat next to a man who was director of engineering for Merck. At that point I had had very interesting assignments, but it looked like I was going to get stuck back in Freeport on some fairly routine job. He asked me if I wanted to come and work at Merck in engineering. At that point, the fortification of flour and bread with vitamins had just been authorized. The sulfa drugs were coming in, and the war was going on in Europe. Merck was building sulfa drug and synthetic vitamin plants as fast as they could.

I went to Merck as a project engineer. I built three or four nicotinic acid plants and several sulfa drug plants. Toward the end of my stay at Merck, Merck got involved in penicillin, and one of Dr. [Alexander] Fleming's assistants, Dr. [Norman] Heatley, came to Merck. He was a rather shy bachelor in a strange town, and we had apartments in the same building.

BOHNING: This was in Rahway.

CAIN: In Rahway. He brought the technology for making penicillin. Just before I left Merck, they were growing penicillin in flasks and extracting it in the laboratory. I designed a four-inch pyrex column to extract penicillin from the laboratory flasks. It made about a dose of penicillin an hour. That was part of the beginning of penicillin.

At that point the war was going on. I had gone to an ROTC school. Merck would have kept me out, but this was the biggest thing that was going to happen in my lifetime and I wanted to be in it. I went in the Army on St. Patrick's Day 1942.

BOHNING: You enlisted?

CAIN: No, I was called as a reserve captain. I went to an officer's pool outside of Washington, and I sat around for about two weeks. People would come in and interview me to see if they wanted me to work in their munition plant or their chemical warfare plant or whatever. Most of them were people I didn't want to work for, so I successfully discouraged all of them from taking me. Apparently there was a rule that if you weren't chosen in two weeks you got shipped out, and I got shipped to Panama. In Panama, it looked like I was going to get some sort of supply job, which I did not want. I heard of a job that was open, and I asked for it, which is contrary to the normal Army procedure. The job was commanding officer of an old regular Army heavy mortar company. In the ROTC, I had been in the infantry, but sometime just before my junior year it was decided that any chemical engineer in the ROTC could transfer to the Chemical Warfare Service. You went to an ROTC camp in Maryland between your junior and senior years. This was how I made my first trip to New York. I joined the Chemical Warfare Service to get this trip to the East Coast.

The Chemical Warfare Service had developed a mortar which was a high angle-of-fire artillery weapon. It was much more accurate than any other mortar. It shot about a forty pound shell. It had been originally developed to shoot white phosphorous, and it had been converted to an infantry weapon.

This was an old regular Army company, and I became commanding officer and the first non-regular Army officer the men had ever seen. The youngest man in the unit was on his second enlistment. Some of them had twenty-five or thirty years service. It was an interesting experience to take over a unit like that, and I had to learn fast. We stayed there a year, and in the course of this, as a sideline job we installed a smoke screen around the canal. Then we came back to the States and

were expanded into a battalion. We got a thousand draftees off the train on Labor Day in 1943 and trained that winter. I went to the Pacific and spent the rest of the war in the Pacific.

BOHNING: Where in the Pacific were you?

CAIN: Well, we landed first in Hawaii. Then the battalion was broken up, and different parts of it went to different places. They went to Saipan, Guam and Peleliu. Then we got back together on Leyte. Then we landed on Okinawa. After the Okinawa landing, we had come back to Leyte and had already loaded on ship to land in Japan when the war was over.

BOHNING: You were really in the thick of things for a number of years.

CAIN: Yes, I was. For a couple of years I was in pretty much the thick of things. We landed about thirty or forty minutes after anybody landed, and gave close support to the infantry. We could get our mortars ashore more easily and quickly than you could get artillery ashore.

BOHNING: Any particular experiences from those two years?

CAIN: Oh, well, you have lots of experiences.

BOHNING: I can imagine.

CAIN: Yes.

BOHNING: I wanted to go back a little bit to the time just before you went to Merck. I found two things from 1939, one a publication you had, and another a patent with [John B.] Chatelain.

CAIN: Chatelain, yes.

BOHNING: I was curious about the one publication in Chemical and Metallurgical Engineering about low-capacity sulfur burners (2).

CAIN: I invented a sulfur burner. There was a need at that point for a sulfur burner that you could control. There were lots of sulfur burners, but there was very little control of the burning rate. The particular need for which I built this burner was in water treating. In this particular case, the water was too alkaline. We had to acidify it. I had the idea that we would burn sulfur and absorb the SO<sub>2</sub> in the water instead of using sulfuric acid. This acidified the water and also removed oxygen. It was a great idea. I designed this burner where the amount of sulfur you burned was determined by the amount of air you put in it. By changing the air flow, the amount of sulfur burned was changed.

There were several interesting applications. I went to the sewage department at Phoenix, Arizona and helped them install a burner. But the most interesting one was some guy who was developing and printing all the films for the studios in Hollywood. He had trouble getting sodium thiosulfate, and he decided he wanted to make sodium thiosulfate. I developed a burner so he could make sodium thiosulfate. I think he made it maybe for a few years, and then someone started making it for him. At that particular point he was having great trouble getting sodium thiosulfate, which was one of the required reagents for developing film. This was my one Hollywood experience. I remember that he took me to the second night of some big film opening.

BOHNING: Really?

CAIN: Not the opening night but the second or third night of something like Gone With the Wind.

Years later I was in India on a trip connected with Petro-Tex, and there was a sugar mill where they were using one of my burners up in northern India within sight of the Himalayas.

BOHNING: Oh, my goodness!

Who was Chatelain?

CAIN: He was the classmate at LSU who had gotten me to come to Freeport. The last time I heard of him he was in ill health somewhere in south Louisiana.

BOHNING: The patent is titled "Liquid mixture suitable for use in drilling wells" (3).

CAIN: I have almost forgotten what that was.

BOHNING: The only note I have is that it is a drilling fluid that contains molten sulfur and Thiokol.

CAIN: Yes. This turned out to be interesting for different reasons. At that particular point in the oil drilling business they were having trouble with something called heaving shale, which was a shale formation which swelled when water hit it underground. There was a need for an anhydrous drilling fluid, and there were a lot of people trying to use oil-based drilling fluids. They could never get them anhydrous enough so that the formations didn't swell and close the hole when you drilled into the shale. Do you know anything about drilling oil wells?

BOHNING: Just a little bit.

CAIN: You have a bit, but the drilling is really done by mud that is circulated through the bit and carries the cuttings up out of the hole. The mud has several functions. It cools and lubricates, but it also builds up a coat on the side of the hole. It helps keep the hole open. They were running into places where they had this anhydrous shale that would swell and close the hole when water hit it. The idea was to use molten sulfur as a drilling fluid. Other people had tried this, but molten sulfur has very peculiar thermal characteristics. It is very fluid at the melting point, but if you heat it much past the melting point it gets very viscous. If you heat it hot enough to keep it from cooling off, it is too viscous to pump. I developed a Thiokol-type material to go in the sulfur to reduce the viscosity at this high temperature. We drilled one well with it, maybe two. I think about that time somebody developed better ways to handle this shale problem. We didn't revolutionize drilling.

BOHNING: Your experiences with Freeport Sulphur up to this point were quite varied. How did you get these different assignments? Did you select some of them?

CAIN: First, I did select some of them. Second, I was single, and most of my contemporaries were married. Somehow, if you're single and willing to go, and there are married guys who don't want to go to Cuba for a year, you collect those assignments. I wanted to and was free to do it.

BOHNING: It must have been quite a change going to Merck, where now you're in plant design.

CAIN: Yes, it was. It was a very interesting change because nobody was interested in anything at Merck except getting these things built as fast as they could. I don't remember making a cost estimate. I can remember being under lots of pressure about time schedules, but nobody worried about money. You had a free hand to do almost anything you wanted to as long as you got the plants built and made them run. It was a completely different experience. We worked long hours because there was a lot of pressure to get things done there. Merck is a great company, and it was a good company then. This part of Merck was run almost entirely by scientists. The research people really dominated, and they had some very fine research people.

BOHNING: How did Merck react to your wishing to join the military instead of staying there?

CAIN: They objected a little bit, but when it was apparent that I really wanted to do it, they quit. We negotiated a time for me to leave. They arranged with the Army for me to stay until I finished whatever I was working on, and I left after that.

BOHNING: You didn't leave the military until 1946. Is that correct?

CAIN: That is when I officially left. I had been overseas most of the time, and I had lots of accumulated leave. I really left the military around November of 1945. I landed in San Francisco and decided I wanted to get my career plans settled before I took any vacation. I came to New York, talked to Merck, and whatever they offered didn't seem very exciting. Freeport, at that point, professed to want to make a major expansion. They wanted to go into the petrochemical business. I went to work for them with the idea of getting them into some major expansion of their business, very likely in petrochemicals.

BOHNING: By this time Dow had already had its Freeport facilities.

CAIN: Yes. Dow's original start was in magnesium. In fact, the day I left Freeport to go to work for Merck was the day Dow produced the first magnesium. I was in the local cafe eating

breakfast in preparation for leaving when two or three Dow people brought in the first ingot of magnesium to show all the local people. Dow's petrochemical activities came later in the war.

BOHNING: Yes, because they were producing styrene there during the war. I think their first big facility there was the styrene.

CAIN: Yes.

BOHNING: By the time you returned, Dow was a principle force in Freeport.

CAIN: Oh yes, they were. I didn't come back to Freeport, I came back and went to work in New York.

BOHNING: I see. What were your first responsibilities with them when you went to New York?

CAIN: My first responsibility was to find expansion opportunities for them. Somewhere in the Freeport files you can find reports of mine recommending that they do almost everything that has been done on the Gulf by Carbide or Monsanto. The problem with Freeport was that the sulfur business was so good that nothing else looked good in comparison. My series of good ideas didn't look good compared to what they were doing. One of the first things I did, or close to the first, was to go to Germany on one of these C.I.O.S. [Combined Intelligence Objectives Subcommittee] missions to Germany. I spent five or six months in Germany on one of the technical missions.

BOHNING: This would have been 1945, right when the war ended.

CAIN: 1946. Germany was in terrible shape. Do you know Peter Spitz?

BOHNING: Yes.

CAIN: Peter's written a book (4) which includes some of this. There were two things that might be interesting. One was something called the strategic bombing survey. Have you run across that?

BOHNING: I think I've heard the name.

CAIN: Right after the war, a group of American engineers and technicians was sent over to see what damage had been done by strategic bombing. This included a number of people that you might want to talk to, except that I've forgotten who they were. They were well-known engineers and technicians. Probably as a result of that, there was something called F.I.A.T. [Field Information Agency, Technical]. It was an agency that was set up to study German industry to see what things they had that would be useful to us. It was headquartered where Hoechst is headquartered, near Griesheim.

This was a semi-military operation. We wore uniforms with a patch that said "Scientific Consultant" but no officer's insignia. We were treated like officers. When we traveled we lived in Army officers' quarters. We traveled in transportation provided by the motor pools, and we had to write reports on what we did. I was interested in two things--acetylene from methane and sulfur processes generally. A DuPont director of the Jackson Lab, Nick [Albert S.] Carter, and I spent a lot of time studying the Sachsse process for converting methane to acetylene. This is pretty much the process Tenneco and Monsanto used and abandoned, where you have a furnace in which you heat methane and convert part of it into acetylene.

[END OF TAPE, SIDE 2]

CAIN: At that point the Germans were in terrible shape. Cigarettes were the medium of exchange. Cigarettes, which now are regarded as poison, were like gold. I didn't smoke, but I got rations of cigarettes, just as the officers did. When you visited some German chemist or plant manager, you would take a package of cigarettes and just casually leave them. It would have offended him to give them to him, but everybody understood. You would just casually leave your cigarettes. We were also forbidden to eat on the German economy. In Germany at that time they had in the plants what they called casinos. We would call them employee clubs, sort of a combination eating and recreation facility that would have included executive dining rooms. I sat in executive dining rooms in Ludwigshafen, Hoechst and other places with a waiter waiting on me to eat a sandwich prepared at the last officers' club or a K-ration. We couldn't eat in their places.

BOHNING: How receptive were the Germans to your visiting them?

CAIN: Ninety percent of them were very receptive. The only one that I remember that was not at all receptive was Dr. [Hans] Sachsse who was the inventor of this methane to acetylene process. He was very difficult. We were in the French occupation zone. Somewhat to my surprise, the French behaved as though they were still afraid of the Germans. In the American and British occupation zones, if there was any trouble at all they would call the guy in and read the riot act to him. But the French were very reluctant to do that sort of thing. We must have spent about a month with Dr. Sachsse spread over two or three months. About every week or so we would have to persuade the French to give Dr. Sachsse hell to get him to cooperate because he wouldn't do anything that he didn't have to do. Other than that, most of them were very nice and very easy to get along with. Interestingly enough, a number of these I. G. Farben research people had worked in Baton Rouge. Standard Oil of New Jersey had had a joint project with I. G. on petrochemicals, and a lot of the original work on making acetylene out of methane started in Baton Rouge in this joint agreement. I met at least three or four of the people who had worked in Baton Rouge.

BOHNING: You mentioned Carter from DuPont. Were there any others in your group?

CAIN: There were no others in my group, but there were lots of others there at the time. There was a Karl Kammermeyer who later became head of chemical engineering at the University of Iowa.

BOHNING: How were you selected to participate in this?

CAIN: I'm not sure. I think it was because Freeport wanted somebody to go. I remember Air Products had a big group over there, because the Germans must have done some interesting things on air separation. There were a number of Kellogg people over there. I've forgotten who Kammermeyer was working for, but everybody was on a different routine. We lived in a German spa at Bad Homburg outside of Frankfurt, and operated out of this old I. G. headquarters in the suburbs of Frankfurt. We were free to do whatever we wanted to. I had a lot of interesting experiences.

A lot of the I. G. records had been gathered up, and some had been carried to Griesheim outside of Frankfurt. I went through those once looking for something, and in the course of it I ran across correspondence between American company officials whose names I recognized but didn't know, who had, in the spirit of the time, signed letters "Heil Hitler." They would have been crucified had those things ever turned up.

While I was in Berlin somebody in the military government said, "We have a job we'd like you to do. It would only take a week or so." I got permission from Freeport to do it. The job was to join a quattrepartite team, of Americans, British, French and Russians to implement the provisions of the Potsdam agreement. Part of the Potsdam agreement was that after the war Germany would be reduced to the industrial capacity they had in 1938. I don't think many people know this. They were setting up teams to go around and determine what the capacity of the different German production units were in order to determine which would be destroyed and which would be left in order to meet the 1938 requirements. This particular team was being set up to look at sulfuric acid and fertilizer. Because of the sulfur business, I had a fair acquaintance with both of them, and I was to be the American representative on this team. The first thing I did was to ask, "What is our policy? The capacity of a plant that has been damaged can be almost anything you want it to be. If you go one way you can strip Germany of any ability to produce anything, or you could do it so they could produce twice what they did in 1938. Now, where do we stand?" To my amazement, nobody had thought about it. One of the good things that happened was that the whole Potsdam agreement was ignored shortly afterward.

We had the first meeting of the team, and we each brought a translator with us. I think they had given me a French-English translator, and the Russian-English translator was a British woman who spoke only British-English. There was a great problem with her understanding my southern accent. [laughter] We convened, we talked, we planned, and we broke up saying, "We'll meet in the morning and start on our trip" to the first factory. That evening I got a phone call saying, "Instead of leaving on the trip, we will convene again in the headquarters."

Just before the first meeting broke up, I had been requested to ask the Russians to have their people be in uniform, because on previous trips the Germans had not treated the Russian people in civilian clothes respectfully, and they had been unhappy about it. I made what seemed like a simple request, that the Russians be in uniform. Everybody who showed up at that first meeting was in uniform. When we convened again a new set of Russians showed up, incensed that we objected to the Russians coming in civilian clothes. We spent about two or three hours trying to explain that we really didn't care all that much about it. We just thought it would be more comfortable if they were in uniform. We broke up again with the same plan to leave the next morning, and the same thing happened. We reconvened and a third set of Russians showed up. I never saw the same Russians twice in a row. By the fourth day it was obvious that this thing wasn't going to go anywhere anyway, so I pulled out of it. I learned later that they got a

guy who ran a canning plant somewhere to be the first chemical expert. They wrote a report that nobody ever looked at because everybody forgot about the Potsdam agreement as soon as things started getting hostile with Russia. That was my one session with being a diplomat.

BOHNING: I have some questions about the dates. You came back from Germany in late 1946, and you were at Freeport for several more years after that.

CAIN: Yes, I was there in 1947 and 1948.

BOHNING: You said they weren't buying your recommendations in the petrochemical area.

CAIN: No, but I spent a lot of time putting together a lot of very interesting things.

BOHNING: Do you think that had any influence on what came much later in your life?

CAIN: It must have, because at that point I knew nothing about the petrochemical business. Everything I'd done had been in minerals, sulfur and pharmaceuticals. I got very interested in petrochemicals and at least had a good academic understanding of it.

BOHNING: There are two more patents. The one with you and Chatelain was dated 1952 (5), and you were no longer with Freeport in 1952.

CAIN: This was done well before that. It was just slow getting through.

BOHNING: That was probably part of the war time backlog.

CAIN: Yes, probably.

BOHNING: It had to do with sodium cyanide.

CAIN: Yes. I've forgotten why, but we ran a HCN pilot plant.

BOHNING: Really?

CAIN: You make HCN much like you make nitric acid, with methane, ammonia, and air. We ran this for quite a long time, and we developed a perfectly good HCN process. Other people had done it, but the technology wasn't readily available. My recollection is that this was in anticipation of something that happened more recently, the use of sodium cyanide in gold leaching. I think that's what motivated them. At least at that point, there appeared to be a shortage of sodium cyanide for gold leaching, and Freeport was still fiddling around in different mineral activities.

BOHNING: There was another one on saline water treatment to decrease scale-forming properties (6).

CAIN: This was also an interesting one. We used the bleed water. There was no pressure to reuse the water. Rather, we were looking for the heat. If you exchange heat in a normal tube thing, it scales up badly. I had the idea of using a heat pump to take the steam off of the hot bleed water, compress it up to a high temperature, and inject it in the formation water. This was what that patent was.

BOHNING: Did Freeport reward you in terms of the patents you acquired for them?

CAIN: I don't think so. No. I don't think that was the custom.

BOHNING: You left Freeport in 1949.

CAIN: Yes.

BOHNING: Why did you leave?

CAIN: The story is interesting. I was talking to Langborne Williams, president of Freeport, telling him I was getting very fed up writing reports that nobody did anything about. He got a phone call from Jock Whitney, who was the chairman of the board of Freeport. Jock was the father of the venture capital business in this country. J. H. Whitney and Company was one of the early venture capitalists. Jock told Langborne Williams that he had made a venture capital investment in a company that

was in trouble, and he needed an engineer to look at it and help get it straightened out. Sight unseen, without knowing what it was, I took the job. I was getting fed up with what I was doing. The job turned out to be in California, in Pasadena. An inventor had sold them on the idea of making wall board out of waste newsprint and a mineral called perlite, a very lightweight aggregate material. Perlite is a volcanic glass that has some water--I'm not sure whether it's trapped mechanically or chemically--and if you heat it at the right rate, you can soften it and expand the water at the same time and blow it up into something like puffed rice. You make a lightweight aggregate which is now used fairly commonly, particularly in plaster.

This inventor had a furnace for expanding perlite and a process under which he was going to pulp waste newspapers and make it into a wall board. At that time and as far as I know still, the moderate priced construction in southern California was built by putting up a frame, then putting composition board on the frame, putting chicken wire over that, and then putting stucco over it. At that point, building board was scarce and was selling at a very high price.

There were three things wrong with the project. One was that this high price was the result of the wartime shortage, and even though it was 1949, they still hadn't built enough capacity to take care of the shortage. About the time I arrived on the scene, the shortage was over and the price of board went down to the point that the process had no economic advantage. In addition, there were all sorts of technological problems, among them that the furnace wore out after two or three days of operation. Production of this wall board required a long dryer, and they ordered a dryer for it. They had designed a plant, ordered the dryer, and bought a site, but the longest dimension on the site was shorter than the length of the dryer. I spent most of my time canceling orders and negotiating cancellation settlements.

Then I tried to salvage something from the perlite project. At that point there was a need for fireproof doors of the kind that you use in hotels and public buildings. These were fireproof doors with wood paneling, and that required a fireproof core material. I got the idea that if you substituted asbestos for the newsprint, we might make a fireproof door. I spent about six or eight months developing such a board. I was successful, and we sold it over to U.S. Plywood, who has since disappeared from the scene. I've forgotten who bought them.

Then, with Whitney's permission, I went into business making aggregate myself. But it became obvious that I would never make much money out of it because this is inherently a small business. You don't ship a five-pound-per-cubic-foot material a long way. It was obvious that this business would

develop in a lot of small plants attached to sand and gravel businesses and not as stand-alone operations. So I had to start over at the age of forty-two or so.

BOHNING: There is a period from 1950 to 1951 when you are listed as consultant.

CAIN: Yes. That was when I was trying to make this perlite business go.

BOHNING: What brought you to the point of saying, "I'd like to have my own business"?

CAIN: I don't know. If I'd never gone through this perlite business, I probably would never have had my own business. Once I did that, I decided I had to try again before I quit completely. The fact that I failed left me with a need to succeed.

BOHNING: Your career at that point had been quite varied, but it was still pretty much engineering oriented.

CAIN: Yes.

BOHNING: When you got to the perlite company, it sounds like you had some management responsibilities as well as technical responsibilities.

CAIN: The promoters of the thing disappeared from the scene after a few months, and it was my job from there on. That's when I decided that at some point I wanted to do something on my own.

BOHNING: You were really then moving away from a totally technical application.

CAIN: Yes. This started when I was in the Army. I decided that if I was going to be in the war I should be in the big show and not a sideshow. That's when I decided not take any engineering jobs. When I got out of the Army, I'd been away from engineering for four years, and I was not disposed to go back to graduate school or study hard to get caught back up again.

BOHNING: When this company failed in California in 1951, how did you go about looking for your next venture?

CAIN: I came back to New York, and I had to find a job. My relations with Freeport were still good, and they let me be a consultant for them. They just made a place for me. I decided I didn't want to go back to work there because I was sure that the work would be the same as before. They made a place for me and paid me while I looked for another job. A couple of things happened in the course of this, and one of them I haven't thought about until now. Somebody offered me a job. It was a company that has since disappeared, the old Wyandotte Chemical Company. They insisted I go through three days of psychological testing, which was a fascinating three days. It was the most thorough thing I have ever been through, and they came back with a very interesting report. First, they said I should be a salesman, and I never thought of selling anything in my life. In fact, I was fairly convinced I couldn't sell anything. They also said I didn't want the job. I didn't realize it, but by that time I had already decided myself that I didn't want the job, which left me with a great deal of respect for the psychological testing people.

I took a job at FMC doing just what I had been doing at Freeport, but I was convinced that they would do something about it. I really started out as an entry level analyst and had worked about a year on miscellaneous projects. At that point, FMC was run by a man named Paul Davies, who was a very aggressive acquirer of businesses.

I lived in New York, and I usually walked to work. I would frequently have breakfast in the Schrafts in the basement of the Chrysler Building where the office was. At that point, one of the directors of FMC was a man named Jan Oostermeyer, and Jan Oostermeyer had just retired as President of Shell Chemical. He was a Dutchman.

[END OF TAPE, SIDE 3]

CAIN: We didn't meet by pre-arrangement, but we accidentally met there and had breakfast together occasionally. One morning we met and had breakfast together and were reading the Wall Street Journal in which there was an announcement that the government was going to sell the synthetic rubber plants. By an act of Congress they had set up the Synthetic Rubber Plant Commission, and they had appointed three well-known civilians to run it and borrowed people from all the other agencies. We read

about the sale and decided that if we wanted to go into a new business, here it is, and we should bid.

We looked down the list, and there were good reasons not to bid on most of the plants because they were run by Exxon, Goodyear, or Firestone, and we felt that there was no point in bidding against them. There was a big butadiene plant that was being run by Sinclair Oil. Sinclair has since been acquired by Arco, but at that point Sinclair was not an aggressive operation. We thought that if we had a chance to get any of these, the Sinclair plant was the one. We put in a bid knowing that the bid didn't mean anything. It was just the beginning of a long negotiation process. We bid \$8 million because that was a number we thought was respectable but not enough that they'd give it to us.

This started a long negotiation process with what they called the Rubber Reserve Commission. I think that the contracts I negotiated set the pattern for the others, because our deal got in front of the others. This was almost a six- or eight-month exercise. I spent half my time in Washington.

At that point I'd never seen a butadiene plant. I think I had to go to the handbook in order to find out what it was and how you made it, but you learn as time goes on. We were the successful bidder. Paul Davies of FMC was pretty much of a one-man show. In Houston, Gardner Symonds ran Tennessee Gas, which is now Tenneco. Paul and Gardner had grown up together and had gone to the Harvard Business School together and were close friends. They decided that they would make this a joint venture between FMC and Tenneco. We had a meeting in Washington to set up the joint venture the same day we closed the deal. They had a long discussion about how we were going to operate. I made a note at the time that I found a long time later, that neither of them understood what the other one was saying. The venture started out without a good understanding between the principals.

We set up a separate organization for Petro-Tex. I went down to represent FMC. Tenneco put a man in, and they retained a guy named Joe Mares, who had been a Monsanto Vice President, to be the managing director or chairman, but he was relatively inactive. Within six months after we started operation, the business just took off. The rubber business picked up to a degree that nobody ever expected. We started making a potful of money. The two principles, Davies and Symonds, had a falling out, and they never spoke to each other again. They both died not speaking to each other.

They fell out over a very interesting thing that made no sense at all. We put in a Houdry dehydrogenation unit. Butane was a feedstock, and at that time the only use for butane was to

put it in gasoline in the wintertime to increase the vapor pressure; you didn't need it in the summertime. There was a big market for butane in the winter, none in the summer. It wasn't a desirable home heating fuel, because propane was better. Butane would sell for two or three cents in the summertime. It might sell for ten cents in the winter. Tenneco put in a butane recovery unit and was selling us butane, and we were paying them six cents a gallon for it, which was a reasonable year-round price. Then Paul ran into someone he knew in the oil business and asked him what the price of butane was, and he said, "Three cents." That was the summertime. Paul was paying six cents. That led to a discussion where both of them said things for which they never forgave each other.

I stayed at Petro-Tex a long time. It was a very successful operation, but it clearly wasn't going anywhere because the two owners didn't get along.

BOHNING: That started in 1955.

CAIN: Yes. It was a nine-year period that I stayed at Petro-Tex.

BOHNING: Prior to that, from 1951 to 1955, you were with FMC. Is that right?

CAIN: My guess is that it was closer to 1952 that I went to FMC, but I'm not sure. I was with FMC looking for things for them. At least a year of that I spent on petrochemicals.

BOHNING: That's a long nine year period.

CAIN: It is. In hindsight I probably shouldn't have stayed there that long because it was a dead end kind of thing; both FMC and Tenneco went their own way. I married late in life, when I was forty-three, and I was happily married. We were comfortable in Houston. Nobody was bothering me much at Petro-Tex.

In the course of this I made two trips to India to work on an Indian synthetic rubber plant. This turned out to be interesting because, as you probably know, butadiene is made by dehydrogenating butane or is a by-product of ethylene cracking. During World War II, someone developed a process of making butadiene from ethanol. Are you an organic chemist?

BOHNING: Yes.

CAIN: You convert ethanol to acetaldehyde, condense the acetaldehyde into a four carbon chain and then dehydrogenate it. A plant was built in Louisville, Kentucky, to make butadiene from alcohol. It ran and made butadiene during the war. The Indians decided they wanted a synthetic rubber business, and they invited Goodyear over to talk to them. Since Goodyear was our main customer, they asked me to go with them. I went with them as the butadiene expert on this trip.

We spent a month in New Delhi and other places. I've never run across any group of people who knew as little and thought they knew as much as the Indian bureaucrats with whom we had to deal. They were telling me all about how to make butadiene. They were determined to make butadiene from alcohol up in northern India in a town called Barelli. We went to Barelli, and saw the site. That's where I saw the sulfur burner that I had invented in the sugar mill there. It was obvious that this was the wrong place to build a butadiene plant. It was the wrong raw material, the wrong process, the wrong everything. The Goodyear representative there was the son of one of [Jawaharlal] Nehru's close friends, so in the course of it I got to meet Nehru several times.

We went back six months later and spent another month there. This time we decided not to fool with it because the whole thing was so badly conceived. Firestone got involved in it and built the plant and ran it for five years or so and finally shut it down because it was in the wrong place with the wrong process. I should have left Petro-Tex sooner, but I was happy at home, I was not under any pressure, and I might have stayed there and coasted.

In 1964, Conoco was also headquartered in Houston. The man who had been running their chemical business died suddenly of cancer and left them with no apparent successor. We shared a consultant named Herman Neuinhaus, who worked for both Petro-Tex and Conoco. I don't know if you've run across anything about him.

BOHNING: No, I haven't.

CAIN: Herman was a former Shell employee, a Dutchman who had a very successful consulting business in New York, mainly bringing European technology to America and vice versa. He is the one who made the connection between me and Conoco.

Conoco was run by a man named Leonard McCollum who was very much of an entrepreneur. We met and got along fine. I went to work for them and stayed there for six years. When I went there, their chemical business was losing a few million dollars a year. When I left the profits were more than the sales were when I got there. We bought a vinyl chloride, PVC, business, built a VCM plant, and built an ethylene plant. We developed an operation in Germany, one in Spain, and one in Japan. It was really quite an interesting operation.

BOHNING: You were managing the chemical operations?

CAIN: I was running this business. Then in 1968 my wife died of cancer after about a two-year illness. Mr. Mac retired and the accountant types took over. I decided that I would do what I had planned to do, and in the middle of 1970 I left. I left without any particular plans. I left on good terms with everybody, but I just decided it was time for me to move on, and I came back to Houston.

The first thing that happened after I announced I was leaving was that one of my investment banker friends called and said, "We invested in a company that's having trouble. Will you come and look after it for a while while you are deciding what to do?" That started a six-year career of looking after five high-technology businesses. There was a collision avoidance device for ships, a gas chromatograph company, a computer control company, a radioactive chemical business, and a company that made test gear for the Air Force.

BOHNING: The 1975 Standard and Poor's Register (7) lists you as chairman of Atec.

CAIN: Atec was one of the companies. They made the instrumentation that the Air Force uses when they test engines.

BOHNING: There was Computer Application Technology.

CAIN: Yes.

BOHNING: Then Iotron.

CAIN: Iotron. That was the collision avoidance device for ships. Those have been acquired by other people. Atec is still running as a separate company and is moderately successful.

BOHNING: At this point you are now getting away from the chemical business.

CAIN: I spent six years out of the chemical business, which in hindsight probably was a good thing, because when I went back into it I had a fresh point of view. The owners of Petro-Tex didn't get along and the company slowly went downhill, mainly because nobody was making any decisions. Something had to be done about it, and they got together and asked me to come and run it. I agreed to run it if I got a free hand. The deal was that I would tell them what I was going to do, they would have ten days or two weeks to tell me no, but if nobody said anything I did whatever I planned to do.

At that point Petro-Tex was losing a lot of money. The idea at the time was to convert it into a storage facility and salvage some money. It owed thirty-five million dollars. It was making eight hundred million pounds of butadiene and losing money for the very simple reason that there was a lot of by-product butadiene coming on the market. They made more butadiene, and the more butadiene they made, the more they would drive the price down and the more they would lose. They were digging their own grave. The first thing I did was to shut down seven hundred million pounds of this capacity, and we went from losing money making eight hundred million to making money making a hundred million. Shutting down made the price go back up.

They had gotten into the neoprene rubber business, and we sold that to Denka, a Japanese company, and paid off all the debt. At the end of two years Petro-Tex was doing well, and Tenneco bought FMC out. They wanted me to stay and run it, but I didn't want to be a Tenneco employee.

Almost simultaneously, the state of Alaska announced that they were going to offer their royalty crude to anyone who would build a refinery/petrochemical plant in Alaska. The decision on who would get the award would be based on who would do the most for the Alaskan economy; that is, who would create the most jobs? A company in Houston called Alaska Interstate had an operation in Alaska that distributed gas in Anchorage in southern Alaska. A dozen people bid, including Alaska Interstate. The chief counsel of Alaska Interstate was a good friend and the chief financial officer was also a friend, and some of the directors were friends. They would occasionally call me and ask me what I thought about the Alaska project. The

man who was running this project for them died suddenly of a heart attack, and they asked me to come in and hold it together, which I did, and then I got interested in it and agreed to stay.

The governor had to choose the group, and the state legislature had to ratify his choice. I agreed to stay through the state legislature ratification, and they agreed to pay me a substantial bonus if I did. I did, and I had some fascinating experiences. Alaska is a great place. If I were young I would go there and stay.

Dealing with the Alaska legislature is just like dealing with small town courthouse politics. In the course of time the governor chose us, but we had to get approved by the legislature. The terms of the bill were such that if they didn't approve it at this session the whole thing would lapse and we would have to start all over. We got down to the last day of the legislature.

The senate ratified it but the house was still screwing around, and the members started going home in anticipation of adjournment. We sent a plane to Fairbanks to bring two representatives back, and they wouldn't speak to each other. We had to send another plane. Our lawyer, a very bright woman who is now the wife of Ted Stevens, the senator from Alaska, went on a plane to the Juneau airport and persuaded an Eskimo legislator with his wife and mother-in-law and all their house plants to come back and vote. We had one of our supporters in the Red Dog Saloon who got in such a state that when he voted he pushed the wrong button and voted against us. But we got it done. Then Alaska Interstate decided to sell this project to a company called Charter Oil, which was a high promotion operation in Florida. I didn't want to get involved with them, so I pulled out and started thinking about what to do.

I decided the next thing for me to do was to buy a medium-sized chemical operation and spend my last years looking after it in semi-retirement. I started on this, and I tried three or four or five things. Gulf Oil had acquired a company called Harshaw Chemicals, about as illogical an acquisition as has ever been made in history. Harshaw was a catalyst maker in the inorganic chemical business. This happened a number of years before, but by the early 1980s Gulf decided they wanted to sell it. I tried to buy it, and a dozen other people tried to buy it. Gulf consistently asked for about twenty-five percent more than it was worth, and then a year later they would come back and offer it at a lower price, but still too high. Finally they merged it with Filtrol and got essentially nothing for it. I tried to buy a chemical business that Tenneco had that made placticizers that Hoechst later bought.

The closest I came was to try to buy the Conoco carbon black business and the Phillips carbon black business and combine them. There were enough savings in research and overhead to pay for doing it. I got the thing all together and I had a deal signed with Conoco, and then Phillips backed out at the last minute because they would be required to show a loss because the price was less than book value. When this came unglued, I decided "Let's quit fooling with these small things." I decided to try to buy the chemical business that DuPont bought when they bought Conoco.

To back up a minute, on this Alaska deal we had two bankers helping us. One was Lehman Brothers and one was E. F. Hutton. At that point E. F. Hutton was not a powerhouse in the financial business, but the man they had on the job was exceptional. He was much smarter than the Lehman people, and so we got to be friends. When I started looking for something to buy, I enlisted him to help me raise money. I knew the DuPont people, but I knew if I walked in off the street they wouldn't take me very seriously unless I had a partner of some substance.

To digress just a minute, one of the things we had in Conoco was a fourth interest in a company called PASA in Argentina, which at one point was the biggest petrochemical operation south of the equator. It made ethylene, ethylbenzene, styrene, butadiene and synthetic rubber. It had problems because it was poorly financed. When I got ready to leave, nobody in Conoco wanted to be responsible for it because they were afraid it would fold up. I made a deal with Conoco to continue to represent them in Argentina. I went to Argentina every six or eight months for twenty years. It also kept me in touch with the chemical people, so I knew pretty much what was going on.

I decided to take a crack at buying the chemical business from DuPont. The man at Hutton that they assigned to work with me was named Clarke Ambrose, and his personal lawyer was Joe Flom, who is the dean of the acquisition lawyers in the U.S. The former chairman of DuPont, Irv Shapiro, had just joined Joe Flom's firm. My friend at E. F. Hutton went to Joe Flom and told him what he wanted to do and he got Shapiro to set up a meeting for us with DuPont. Shapiro was never involved again. That's when the formation of Vista Chemical started. Our meeting was with Bob Richardson, who was on the DuPont executive committee. He was very polite and told us that they would consider selling the Conoco chemical business. They would not have an auction. They would have one other company make them a competitive offer.

[END OF TAPE, SIDE 4]

CAIN: DuPont is a great company but they're not noted for speed. Things moved fairly slowly. We would ask for information, and it would be weeks before we would get it back. Then it wouldn't be quite what we wanted, and we would ask again. We started about September or October of 1982. In June of 1983 DuPont said we had to make an offer. We made an offer at the time, and after a little fiddling around they accepted it. We offered six hundred million dollars for the business subject to adjustments, inventory, and all sorts of things like that. But this was all verbal, and we spent three months writing a fairly simple letter of intent. We signed the letter of intent in October of 1983.

Up to that time they hadn't let us talk to the management. At this point they let us talk to the management. We had a major problem in that there were all sorts of ties between the Lake Charles refinery and the Lake Charles petrochemical complex. They used joint barge-loading facilities, and the steam and power systems were intertwined. We took kerosene from the refinery, extracted the straight-chain hydrocarbon and sent the raffinate back to the refinery. There were over thirty contracts that had to be worked out. I decided that the thing to do was to let the management work this out.

On the morning of the first of November I was jogging up on the roof, and I felt some sharp pains in my chest. I would slow down and it would go away, and I would speed up and it would come back. Two days later I was having open-heart surgery. When I started recovering, I would check on the phone to see what was going on, and it was obvious nothing was going on. The management and the refinery people couldn't get along, and they couldn't settle anything because they had been fighting with each other over this sort of thing for a long time. This was the first time the refinery people had the ability to be difficult, and our management was probably difficult. The first time I was able to travel was right after Christmas. We went to Wilmington, and DuPont said, "If you don't get this all settled within thirty days, we're going to pull out." I made a deal for them to assign some senior people to negotiate, because we had been dealing with too low-level people. A month later, we hadn't finished, but we'd gone so far that they were happy.

Then we started having problems in another area. The banks had agreed to put up part of the money. The Prudential Insurance Company and a group of insurance companies agreed to put up the subordinated debt. Everything seemed to be moving along very well. Some time about February or March the Federal Reserve wrote a letter to all banks asking for a report on the high-leveraged transactions. Some banks just regarded it as a request for information. Others decided the sky was falling and ran for cover. Our lead banks were Manufacturer's Hanover and Banker's Trust.

DuPont would check with Prudential and the banks every two or three weeks to see if everything was in order. Good Friday morning they called the banks and everything was in order. That afternoon, Banker's Trust called and said they were pulling out of the deal, and everything folded up. We would have been dead in the water and the thing would have fallen apart, except that DuPont decided to help. This deal was not that important to them, but they didn't want to waste all this time and get nothing done. They put out the word among the banks that DuPont wanted this thing to go through. They signed a piece of paper that said "Guarantee" at the top, and DuPont signed it at the bottom, and the lawyers wrote practically nothing in between. It guaranteed some of our debt to a limited extent under some unusual circumstances, but the important thing was that DuPont indicated to the financial community that they wanted this deal to go. Our bankers got together, and from then it was just a matter of putting together the legal things. We got it closed in July. That started Vista Chemical.

Along the way, I decided that doing deals like this was more fun than running a chemical company. I had run across a young man who was bright and able and had been doing mergers and acquisitions for a local firm. The principal of the firm had a heart attack and had to give up the business. He asked me to help him take it over, and I did. He has done LBO's [leveraged buyouts] separately from me, of smaller, non-chemical things.

Some time in the fall of 1985, when I was chairman of the board of Vista, I heard that the Monsanto Texas City plant was for sale. I called Monsanto and found that they were already talking to dozens of people about buying it, including Amoco and Standard of Ohio. I got all the data and made an offer.

At this time I had outgrown Hutton, and they were having trouble internally. People with whom I had worked had moved on to other things, so I went forward on my own, and found that raising money wasn't a big job. The Texas City plant made acetic acid, acrylonitrile, styrene, plasticizers and a few odds and ends. The key to getting financing was a contract to buy some of the output. Nobody wanted to sign a styrene or acrylonitrile contract, but the idea occurred to us that BP [British Petroleum] was big in acetic acid everywhere but in the United States. They might want to get in the acetic acid business here. We approached them and very quickly made a deal under which they underwrote part of the financing in return for us effectively turning the acetic acid business over to them. That let us finance Sterling Chemical.

BOHNING: I've read somewhere that in these LBO's, certainly in the period that we are talking about, there was a lot of activity in all areas, but Vista was the first one in the chemical industry.

CAIN: Yes.

BOHNING: Part of an LBO, as I understand it, is that you end up selling off part of the assets, and you didn't do that.

CAIN: I didn't do that, and that's not a necessary part of it. A lot of people did that, but that just wasn't my style. The other thing we consistently did was not cut anybody's wages and not cut benefits. We commit right up front that we're going to maintain the same wages and benefits. I've been lucky in that, except for Vista, in all of the subsequent things I did, the seller didn't want to sell anything but the assets. They did not want to turn loose any staff except plant managers and below. I did not have any requirements to take upper level staff, which made things very easy. We've consistently run with about a third or fourth the overhead the predecessors ran with, and run better.

Sterling Chemical had not made any money for a number of years, and if we hadn't made the BP contract, we would have never financed it. With the BP contract, we were able to finance it. The styrene business turned around within two or three months after we closed the deal, and the prices went up. In 1987, one year later, we were out of debt and declared a big dividend, and then we went public, which was a mistake. This is too cyclic a business to be a public company.

We put in stock option plans, but in addition I wanted them to be at risk. We insisted that all the key people buy stock. I wanted them to have not just a win-win situation, but one where if things went bad they had to buckle down and help. We put in ESOP's, Employee Stock Ownership Plans. I would say that in the four big very successful deals that I've done, every key man, and by this I mean people earning from sixty thousand up, is now a millionaire. The employees get from the ESOP from three to five times their annual salary.

The chemical business is a gossipy business and everybody knew that the owners of the ethylene plant in Corpus Christi, Solvay, Union Pacific and ICI, were not happy with it. They hired Jack St. Clair, who was a former president of Shell Chemical, to sell it for them, although they would never admit they were selling it. Jack told me that they had financed with borrowed money which was guaranteed by the parents. They were not making enough money to pay off the loans; the owners were

paying off the loans. They were determined not to sell it for less than the unpaid balance of the loan. It wasn't worth that. I first talked to Jack about this around 1982 or 1983. About once a year I'd check with him, and the loan had gone down, but was still more than the value of the plant. About 1986, the loan had gone down to the point where I thought the plant was probably worth it. I set out to buy it, and I started negotiating with him. On these things, you try not to get too far ahead of whoever is going to supply the money. I talked to Chase, who I thought would finance it. They said, "Maybe you can convince us that the ethylene business is going to turn around, but we won't finance a one-plant, one-product operation. Go find something else."

I started looking around, and I called DuPont about half of a glycol plant they owned. They said, "It's for sale, but we're much more interested in talking to you about three polyethylene plants and an ethylene plant." I started talking to DuPont about that, started talking to PPG about the other half of the glycol plant, to ICI about their glycol plant. My only failure was that I was not successful in buying the DuPont half of the glycol plant because it was in a different group at DuPont, and I couldn't make a deal with them. We put together seven ethylene-related plants into something called Cain Chemical, and we did it just as the ethylene business was turning around. The first month this Corpus Christi plant ever made money was the month we bought it. It was just blind luck. I had to convince banks, though, that this was going to happen.

BOHNING: The early test that you talked about before that said you would be a good salesman--it must have been pretty accurate because of your ability to do just what you've said.

CAIN: The key to selling was to sell people. Cain Chemical just took off like a rocket. We took a few low-level overhead people, but Bill McMinn who had been at FMC was the president. We got a man from Carbide, John Luchsinger, to run the polyethylene business. A man that I worked with at Petro-Tex, Russell Bowers, ran the hydrocarbon part of the business. We persuaded a fairly high-level treasurer to leave Arco and join us as financial officer. When we put Sterling Chemical together there was a bright young lawyer who was very successful in one of the law firms here. He didn't work on my deal, but he wanted to leave the law and go into business. He left and joined Sterling Chemical as the chief counsel and vice president of everything that nobody else was doing. I did the same thing at Cain Chemical and the same thing at Fiber Industries. I staffed these people from outside, but they were mostly people I had some tie to or knew something about.

Cain Chemical was doing so well we started to think about going public. In the beginning we got studies of what it is worth to go public. The Nalco Company has for a long time had a quail hunt every year, to which they invite people from the chemical industry. I have gone for number of years and I'm going this Thursday. On a comparable Thursday in 1988, I went on it, and one of the people there was Dale Lawrence of Occidental. He told me Occidental wanted to buy Cain Chemical and offered eight hundred million dollars for it. I laughed at him. He went away and about six weeks later they called back and offered us a billion two hundred million for the equity. After a very short discussion, we made a deal. We transferred the money five weeks later, which was almost a record. This company that we'd started and put twenty-seven million dollars of equity into sold for a billion two in less than a year.

BOHNING: In that short period of time, you were able to acquire these companies because the big companies were getting out of commodities and looking for specialties.

CAIN: That's right.

BOHNING: They were looking for a faster profit.

CAIN: Yes.

BOHNING: All of a sudden, these became available and then the market turned around after you acquired them. What was it that Occidental saw that made them make an offer of that magnitude?

CAIN: Since these are fairly bright people, I think that first of all they were confident that they could pay for it before the boom was over. Second, it fit into their overall scheme of things. Occidental had never been like some of the other chemical companies; it has been a commodity operation. Even in the oil business, they haven't done much upgrading. It fit in the Occidental pattern, and they were confident the boom would last long enough that they would get their money back, and they did. It worked very well. They are happy with the deal.

BOHNING: One of the other things that I've noticed is that you have involved employee ownership.

CAIN: I have.

BOHNING: This is for a number of reasons--it gives you a more dedicated employee, and more efficiency in your operation. I also read that when you sold Cain Chemical, you personally weren't convinced, but it was for the welfare of your employees and their benefit that you made that sale.

CAIN: I think that's essentially true, because at that point I had enough money that money was not a factor anymore. Here is something that I'd put together. I was running it differently than the way other people would run it, and it was a great temptation to see if this would really go forward. Sitting around the table with me were Bill McMinn, John Luchsinger and others. Essentially everything they had was in this business. I couldn't bring myself to put them at risk by insisting that they not cash in at this point. I would have loved to have kept it, but it just didn't make any sense for me to keep them from cashing in.

BOHNING: There are a number of reasons why your LBO's were successful. We've talked about employee ownership, we've talked about not having upper level management that you had to bring along, which gave you more flexibility and you could cut off some of those layers. Another reason was supply contacts with major companies so you didn't have to have a big sales force.

CAIN: Yes. When we took over the polyethylene business, DuPont had a thirty-man sales force. We had a three-man sales force because we decided in the beginning that there were a lot of small accounts that were just not worth fooling with. We've done the same thing with Sterling Chemical. We had a lot of what you would call processing agreements. If Phillips, for example, wants styrene, we'll take their benzene and ethylene; we're doing the same making styrene for Monsanto. Probably a third of our styrene business is on processing contacts, and this has several advantages. You don't need a lot of salesmen, and the other big advantage is that you don't have any working capital tied up. In this sort of thing you get very conscious of money and capital. One of the things we've done consistently is operate at much lower inventories than any of our predecessors did, which means we use that money to pay off debt. We've consistently run with fewer rail cars than they use.

When we bought Vista, the Ford Motor Company said, "In order to sell to us you have to have a statistical quality control program." I thought that was a lot of crap because we never had a quality problem, but we had to have such a program, so we did. We looked around, and I discovered for the first time Dr. [Edwards] Deming. I don't know whether you've run across Deming

or not. We got one of his disciples to come in and give courses, and I was sold on the whole thing. As a result, we made major improvements in our operation. As I say, we're consistently using about twenty percent fewer rail cars than our predecessors used. We're running at much lower inventories than they did. We operate with less working capital, and I think we probably have a more effective operation across the board, mainly because of employee involvement. Part of the Deming philosophy is that when you start trying to correct something you don't invite the engineering department, you ask the people who are doing it how to do it better. We run very good operations.

BOHNING: I think I've read that you could reduce overhead by seventy or eighty percent sometimes.

CAIN: I'll give you an example. This isn't too accurate, but Monsanto was charging twenty-seven million dollars overhead to the Texas City plant, and it was all mixed up with other departments. When we took it over we ran it with seven million dollars overhead. Cain Chemical had a total overhead including R&D, and we had a fair amount of R&D, of two percent of sales. DuPont will have an overhead of fifteen percent of sales. These are big numbers.

With fewer levels of management you have better communication. If everybody is busy, nobody has time to worry about protecting his turf. In the Deming system, one of the results of these team efforts to make improvements is that people start talking to each other across departments and across levels of management.

BOHNING: I imagine you get decisions made much more rapidly, and people feel more free to make a decision without having to explain it to someone.

CAIN: Yes. That's right. It's made a difference.

BOHNING: Was there life after Cain Chemical? That must have been a whirlwind couple of years for you.

CAIN: The next thing is that Celanese merged with Hoechst, and, as part of the deal, they had to divest their polyester fiber business. Hoechst was calling the shots, and they decided to divest the Celanese rather than the Hoechst plants. We bid on it and were the successful bidder. Then we got into a long six-month hassle with the FTC [Federal Trade Commission] because they

wanted Celanese to divest different things than Celanese wanted to divest. The FTC jumped to the conclusion that Celanese was divesting the poorest plants. I did not agree. After a six-month discussion, I finally got them to approve it. We ran Fiber Industries for a couple of years and sold it to the Wellman Company. The equity owners got thirty-four times what they put in. The employees wound up with about twice their annual salary from the ESOP.

[END OF TAPE, SIDE 5]

BOHNING: Is there anything specific to which you can attribute your success in spotting these areas?

CAIN: I've never really thought about it as success. A lot of it is luck. I think some of it is having been out of the business long enough to get a detached view. One of the surprising things was that so few people in the ethylene business recognized the turn-around in ethylene. If you looked at the numbers, it was absolutely obvious. The people in the business did not recognize this because they were too close for too long and lost perspective. I think getting out of the business was helpful.

The Alaska experience was interesting for a different reason. In the course of mergers and acquisitions, I'd run across a lot of investment bankers, but I never worked with them very closely. At least one of the things I brought away from that was a confidence that money could be raised if you have a salable idea. I don't think that I had ever appreciated that, and I suspect that a lot of people have good ideas, but are convinced they can't raise the money to do it. You can if you know how.

BOHNING: Let me ask the opposite question of the last one. That is, have you had any failures?

CAIN: None of the LBO's that I have done personally have failed. My partners have had some relatively small failures. The deal I made when I set up the Sterling Group was that I would do these chemical things separately, and that included Vista, Sterling Chemical, Cain Chemical, Fiber Industries and Arcadian, which is a fertilizer business. I did have several failures in the early 1970s before LBO's started.

BOHNING: Let me just review a little bit then about the Sterling Group. You and Frank Hevrdejs started it in 1982, and then somewhere around 1987 there was a merger with another company.

CAIN: We took another group in in 1987. We took a few individuals in. When Cain Chemical was sold, three of the partners made enough money that they decided to retire. We had one woman partner who wanted to go into a different kind of business, and everybody was comfortably well-off financially. So they did, and we have now four people left.

BOHNING: What is the climate of the 1990s compared to the climate of the 1980s?

CAIN: First, I think that most of the things that people want to sell have been sold, at least in the business I've been in. Second, it is harder to raise money than it was back in the 1980s. Third, there will be fewer deals, and you will have to put more equity into them, which means that the leverage won't be as great. They won't be as profitable if they are successful, but you will have a little more protection against failure. In Sterling Chemical, because of this BP contract, we put five million dollars equity in a two hundred and fifteen million dollar deal, which is under two and a half percent equity. If something like that is successful, the multiplier is just tremendous, but you can't do that anymore. Now you have to put in twenty or twenty-five percent equity. The big profit is gone.

BOHNING: Essentially, it has been the last ten years of your life in which you have really been actively involved in this.

CAIN: That's right, yes.

BOHNING: What holds for you now, at almost the age of eighty?

CAIN: I'll be eighty in two months.

BOHNING: Do you plan to continue your activities?

CAIN: I don't know. You know, this may sound a little odd, but at no point in my career have I done a lot of long-range planning, and I'm still not. I'm just going to do what interests me as long as it interests me. I'm not going to sit up till

three or four o'clock in the morning negotiating with lawyers anymore. I made two trips to Spain and back in one week in the Vista negotiation. I'm not going to do that sort of thing anymore. I came back from Florida this morning, and I'll go back Saturday and probably stay there a week or two.

BOHNING: Do you still have a place in Houston?

CAIN: Yes. We have a place here and a place in North Carolina and one in Florida. So, I'm not working all that hard.

BOHNING: We haven't talked about your family.

CAIN: I was the oldest of six children. I have two brothers and three sisters, all still living. One brother's a doctor, and he is still practicing. One was an editor of a textbook company, and he's retired. My sisters are married. I got married the first time when I was forty-four. We were married twelve years and didn't have any children. My wife died of cancer in 1968. I remarried in 1972, and Mary had two children. They are in their late thirties, early forties, and we have three grandchildren. I'm very fond of the grandchildren. Probably a typical grandfather.

BOHNING: What do you do for fun? What do you enjoy besides mergers and acquisitions, which obviously have given you a great deal of pleasure.

CAIN: I play golf. I play croquet. I do a lot of bird hunting in the hunting season and that's how I got together with Occidental.

I can be fairly articulate on the LBO's because I've been writing an account of them. I am writing this more for my grandchildren than for publication. I've finished Vista, Cain Chemical and Sterling Chemical, and I'm starting Fiber Industries and Arcadian.

BOHNING: Is there anything else that you'd like to add at this point?

CAIN: Not that I can think of.

BOHNING: It's been very fascinating, and I'd like to thank you for spending the time with me.

CAIN: Thank you for taking the time to come.

[break]

CAIN: Right now, we're having a problem creating enough jobs. The evidence shows that the Fortune Hundred Companies had a decline in employment in the last ten years of two million jobs. In the meantime, there's been a net production in jobs. All of the job production has been in the small- and medium-sized companies. Big companies let themselves get badly overstaffed and have been losing rather than creating jobs. We have not yet found what both the Germans and the Japanese have found is the way to run big companies effectively. We now have a situation where the managements of many big companies run the companies essentially without any guidance from the outside because they choose their own directors.

I think it's significant that some of the most successful big companies still have some outside influence. For example, DuPont is still very much influenced by the retired DuPont people, the DuPont family. Dow is still dominated by a sort of Midland mystique. Carl [Gerstacker] is still around, and I'm sure that he is still an influence. That is true in a lot of companies. General Motors is probably the worst example of the lot. They've gotten trapped in the bureaucracy they built up. Ten years ago they dominated the automobile business, and two months ago the chairman of General Motors was asking the Japanese not to be too tough on them. If nothing else, it's an embarrassment to the U.S. business world. Somehow we've got to find a way to bring some sort of direction--the specialists call it corporate governance--into the running of large organizations. This is a field in which both Ralph [Landau] and I have been interested.

BOHNING: I did notice that you were involved with the Stanford program [Center for Economic Policy Research].

CAIN: Yes.

BOHNING: He spends quite a bit of his time out there.

CAIN: Yes, he does. This is all involved in studying what factors influence productivity, growth, etc. My next activities will involve this sort of thing. My golf game isn't good enough to make a career of that.

BOHNING: Thank you again.

CAIN: Thank you.

[END OF TAPE, SIDE 6]

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